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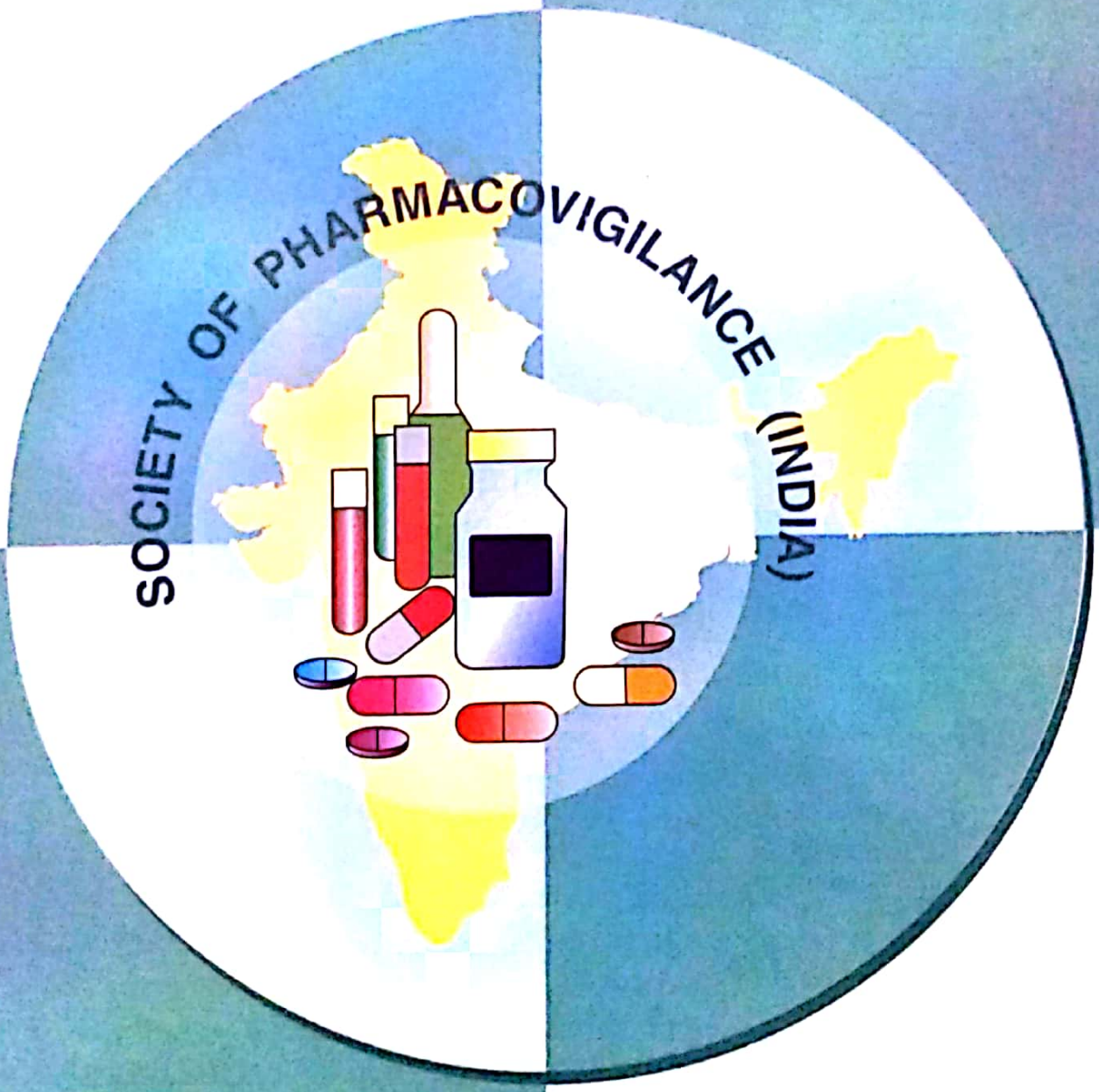

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EDITORIAL...

With advent of newer technologies like High throughput Screening, Combinatorial Chemistry, Pharmacogenomics, Computer - aided drug design, the drug discovery process has certainly taken leaps and bounces. At the same time clinical research and clinical trial has emerged as a lucrative business in pharmaceutical and medical sciences. Even in under developing countries an awareness has come for Pharmacovigilance and Pharmacoeconomics. Through this journal we wish to encourage studies related to pharmacovigilance, pharmacoeconomics and adverse drug reactions.

This issue consists of a report on pharmacoeconomics study in Turkey and an article on pharmacovigilance in International prospective. We wish the journal get more research articles in the area of pharmacovigilance and drug safety.

The Editorial Board is thankful to the contributors and the members of the Editorial Board for their help and cooperation.

Dr. Ramesh K. Goyal
Chief Editor

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A STUDY ON THE UTILIZATION OF PHARMACOECONOMY BY DRUG COMPANIES IN TURKEY

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ABSTRACT

Many countries do not consider pharmacoeconomic aspects in their drug policy. We have studied pharmacoeconomic aspects of companies operating in the drug industry of Turkey. The methodology included the surveys conducted with the 63 members of the Association of Pharmaceutical Manufacturers and Association of Research-Based Pharmaceutical Companies of Turkey. The survey included questions to find out whether the companies consider the pharmacoeconomical aspects or not, if they do, what kind of analysis are used and what is the point of view of the companies on these kinds of studies. On the basis of the results of the study, 85 % of the drug companies operating in Turkey declared that a department related to pharmacoeconomy does not exist in the company. While 76 % of the companies surveyed declare that pharmacoeconomical studies are of utmost importance and there is necessity to conduct these studies in Turkey. The survey results revealed out that 82 % of the companies did not conduct any pharmacoeconomical analysis to date. The fact that there is no obligation to conduct pharmacoeconomical analysis by drug companies in Turkey remains one of the important reasons for nonperformance of any pharmacoeconomical study. In order to decrease the increasing cost of drugs in health sector, and to utilize resources efficiently, it is recommended that adoption and implementation of legal regulations on pharmacoeconomical area can be beneficial.

INTRODUCTION

Clinical pharmacology constitutes the focus of determining the genuine place of drug in the course of treatment according to the utilization value. In this respect, it is inevitably assessed to consider the biological, medical and pharmaceutical sciences. Like that of ordinary goods linking the chain of material links during production and consumption, drugs also fall under the sphere of interest of economic science in particular Pharmacoeconomy.

Health sector in Turkey experiences a rapid change process in line with the general tendencies of the world. One of the most determining factor of this process is the search for maximum efficiency in resource utilization. We found that there is scarcity of resources. However, efficient utilization of resources will always be a preferential item of business.

Every individual may not attain all possible interventions to cure his health conditions. Therefore, priorities should be determined accordingly. As drug companies in Turkey are not obliged to conduct pharamacoeconomical studies and remuneration agencies do not consider studies having conducted in this respect while preparing positive lists, in many companies it is not considered necessary to establish such a department.

Pharmacoeconomy is a discipline which assesses the comparison of the cost and benefits of a drug/treatment using the methods of health economy. Furthermore, it is a branch of economy which compares various pharmaceutical products or a treatment method against

alternative methods by applying cost-utility, cost-effectiveness, cost minimization and cost-benefit analyses. Pharmacoeconomics has emerged as the part of the health care systems that measures and compares the cost of products and services in relation to pharmacy with respect to clinical, economical and human. It encompasses methods concerned with the minimization of costs, cost effectiveness, cost of illness, cost utilization, cost benefit, decision analyses, and also quality of life and other human evaluations are included.

In this study, we have made an attempt to determine the perspective of firms operating in the drug sector of Turkey towards pharmacoeconomical aspects and their performance in this respect.

METHODOLOGY

It was a surveys conducted with the 63 members of Association of Pharmaceutical Manufacturers and Association of Research-Based Pharmaceutical Companies of Turkey producing generic and original drugs in Turkey in 2006 It included medical director, general managers and clinical trial managers. The survey included questions to find out whether the companies conduct pharmacoeconomical studies or not, if they do, what kind of analyses are used and what is the point of view of the companies on these kinds of studies.

RESULTS

Turkey has many pharmaceutical companies. It was found that in terms of duration of operation in Turkey majority have been working for a long time. It was found that 9.1 % of them are operative between 1 to 5 years, 18.2 % of them between 6 to 10 years, 21.2 % of them between 11 to 15 years and 51.5 % of them more than 15 years. (Fig 1)

It was found that 83.9 % of the companies do not have any department related to pharmacoeconomy. In the companies having departments related to pharmacoeconomy, doctors and economists work in these departments.

Only 19.4 % of the companies reported to conduct pharamacoeconomical studies.

Althought only 4 pharmacoeconomical studies were conducted by pharmaceutical companies, they foresee to conduct more in the future.

It was found that 32.3 % of companies are conducting pharmacoeconomical studies abroad.

Survey reported 9.1 % of studies concern drugs of antibiotic groups, 6.1 % concern with antidepressants, 3 % concern with Analgesics, and 15.2 % concern with other groups of drugs such as: antidiabetics, oncology, antihypertensive drugs, drugs for infertility and anticoagulants (Fig 2).

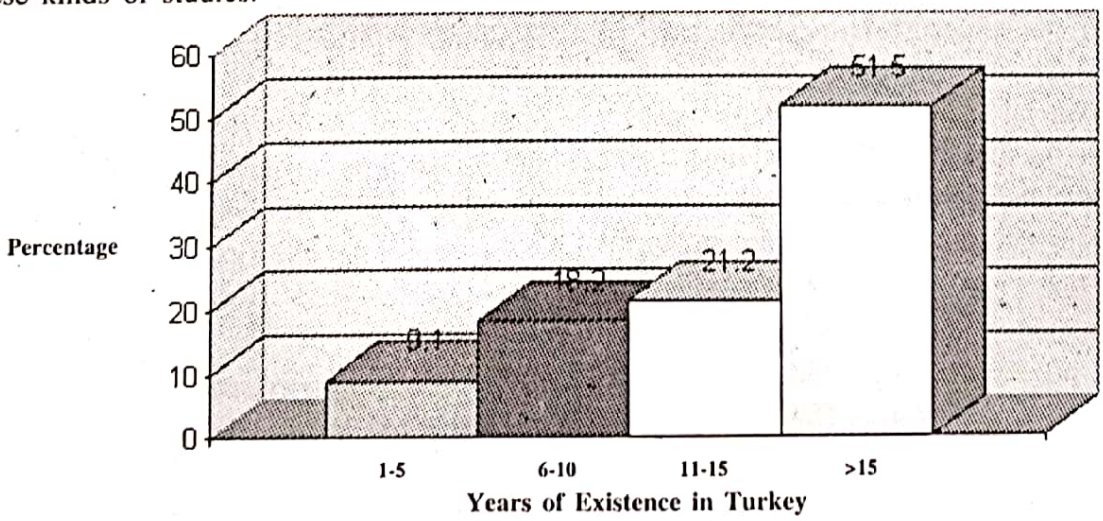

Fig 1: The duration of operation in Turkey of the companies

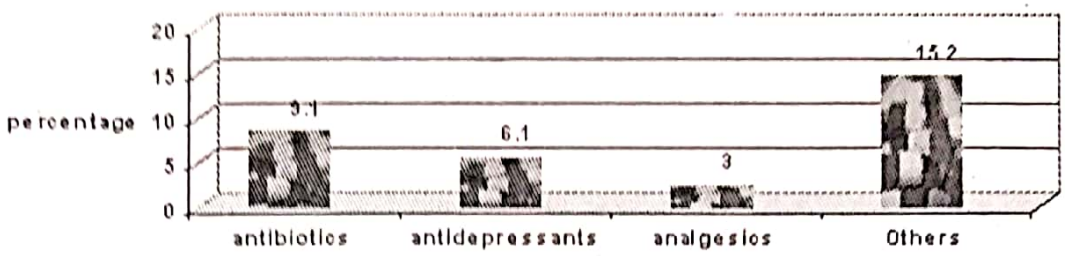

Fig 2 : Distribution of drug groups on which pharmacoeconomical studies were conducted abroad

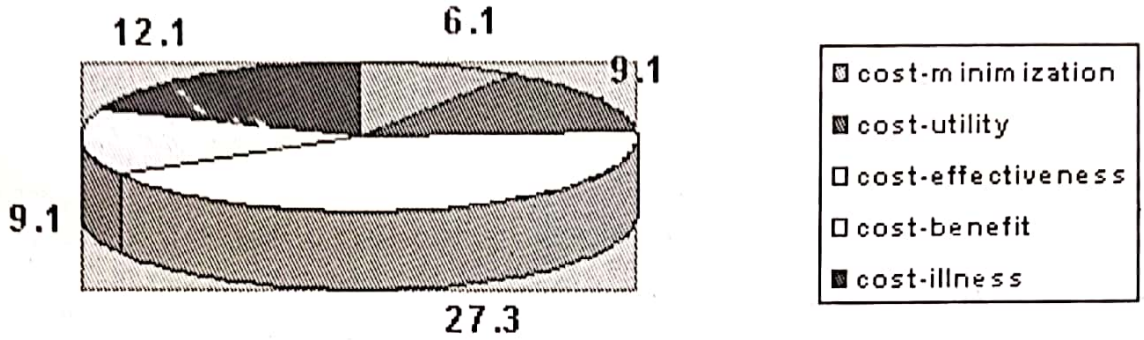

Fig 3 : Pharmacoeconomical analysis methods applied by the companies

As a part of methodology of pharmacoeconomic survey 6.1 % of companies were found to apply cost-minimization analyses, 9.1 % apply cost-utility analysis, 27.3 % apply cost-effectiveness analysis, 9.1 % apply cost-benefit analyses, and 12.1 % apply cost illness analysis among pharmacoeconomical analysis methods (Fig 3).

When the companies were asked about analyses methods applied that they did not know exactly as mostly they are conducted abroad .Only one company answered the question in the following way: cost-effectiveness and cost-benefit methods are used for Hemostatic products, cost-satisfaction and illness cost methods are used for antidiabetics and also cost-effectiveness analysis is used for insulins.

When analysis about the reasons for the conduct of pharmacoeconomical studies; 3 % account for stock management, 3 % account for monitoring adverse incidents, 9.1 % account for choosing the best drug and 9.1 % account for pricing, remuneration and marketing startegies (Fig 4).

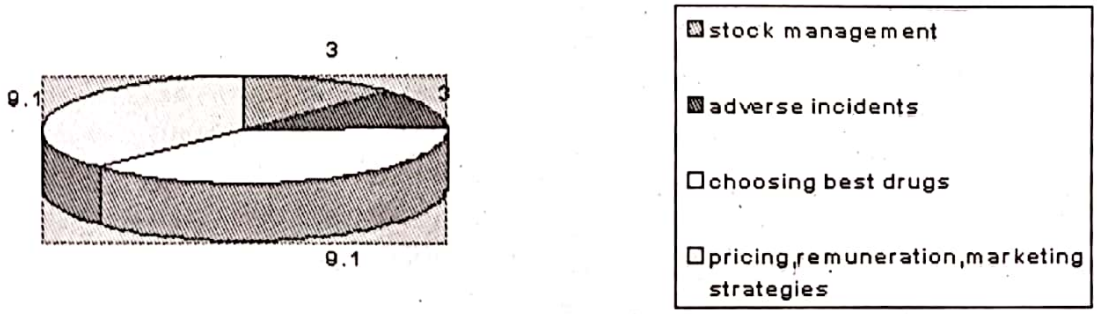

Fig 4 : The reasons of companies to conduct pharmacoeconomical studies

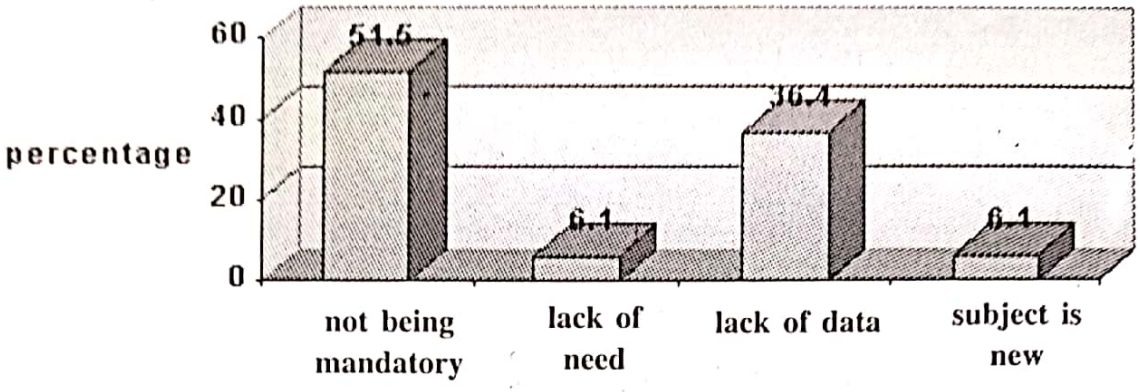

Fig 5 : The reasons of companies not to conduct pharmacoeconomical studies

The reasons of companies for not conducting pharmacoeconomical studies; 51.5 % account for not being mandatory, 6.1 % account for lack of need as there is no equivalance of drugs in our country, 36,4 % account for lack of data on illness cost in Turkey and lack of institutions conducting these kinds of studies, and 6.1 % account for being in the learing process as the subject is new in Turkey (Fig 5).

The point of views of companies can be divided into two groups: 84.8 % companies think that pharmacoeconomical studies very new and important, but they shall conduct these kinds of studies if it becomes compulsory, while 15.2 % of companies think that they are tools to help the use of resources effectively.

Survey reported if it is appropriate for Turkey, 9.1 % of companies use the results of pharmacoeconomical studies, while 12.1 % of the companies do not.

DISCUSSION AND CONCLUSIONS

While the health sector is experiencing a rapid change process, one of the most determining factor of this process is the search for maximum efficiency in resource utilization. That is why, resources should be utilized efficiently and strategies need to be developed with respect to this purpose. In order to attain these objectives, economical assessments should be carried out and utilization areas of scarce resources should be decided. As drug companies in Turkey are not obliged to conduct pharamacoeconomical studies and remuneration agencies do not consider studies having conducted in this respect while preparing positive lists, in many companies it is not seen necessary to establish such a department.

Pharmacoeconomic evaluation is an analytical tool used with increasing frequency to assist decision making in the financing and management of pharmaceutical products in the health care system or national health insurance programs of an individual country. Pharmacoeconomic (PE) guidelines can be used as a standard for preparation of studies to be included in application for reimbursement, a guide for design and implement a study, or a template for evaluating the economic study reports.

There are 23 countries who have developed pharmacoeconomic guidelines. They are Hungary, Poland, Russian Federation, Belgium, France, Germany, Netherlands, Switzerland, Baltic,Finland, Ireland, Norway, Scotland, Sweden, England&Wales, Italy, Portugal, Spain,Canada, USA and China. Of these Belgium, England & Wales, Canada, USA and Israel have got submission guidelines for formulary listing. In order to decrease the increasing cost of drugs in health sector, and to utilize resources efficiently, adoption and implementation of legal reguations on pharmacoeconomical area should be beneficial.

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SOPI JPDS

PHARMACOVIGILANCE IN INTERNATIONAL PERSPECTIVE NEW DEVELOPMENTS

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According to the WHO definition pharmacovigilance is the science and activities relating to the detection, assessment, understanding and prevention of adverse effects or any other possible drug-related problem (1). This is a more detailed definition than the one Rawlins used in his often-cited lecture for the Royal College of Physicians in 1994: Pharmacovigilance is the process of identifying, and then responding to, safety issues about marketed drugs (2). This latter characterisation came from a report by the Committee on Safety of Medicines and the Medicines Control Agency in the UK, which explains the emphasis on the practical implementation of the concept. In the literature pharmacovigilance is frequently but unjustified put on a par with Post Marketing Surveillance. This approach highlight's most visible method of pharmacovigilance: the spontaneous reporting system (SRS). In their latest textbook Mann and Andrews define pharmacovigilance as 'the study of the safety of marketed drugs under the practical conditions of clinical usage in large communities (3). But this includes more than only collecting reports of possible ADRs and looking for signals of new ADRs. More and more pharmacovigilance is considered to concern the safety aspect of drugs from first phase of development of a new drug to the surveillance of the safety of marketed drugs.

Different aspects of pharmacovigilance

Pharmacovigilance as a scientific discipline

Pharmacovigilance as a science is dedicated to the safety of drugs as used in the clinical practice, based on experiences from the clinical practice, thus generating knowledge on the harmful effects of drugs, both at the individual and the population level, that will eventually be applied in the clinical practice and thus lead to a safer use of drugs.

As in most applied sciences the field of pharmacovigilance is an amalgam of numerous other scientific domains, each contributing their own expertise to the field, which combined knowledge fosters drug safety reasoning. Pharmacovigilance is essentially a clinical science.(4) To allow a sound judgement of any adverse effects of drugs we need clinical knowledge at the level of the individual patient. It takes extensive general medical knowledge, preferably supported by direct experience with patient care, to be able to make an accurate assessment of the impact pharmacotherapy is likely to have, which becomes even more urgent when unintended adverse events occur. Clinical pharmacologists have been instrumental in the development of the field and are still indispensable, as are the pharmaceutical sciences. By profession, pharmacists are the experts when it comes to drugs. An indepth knowledge of the mechanisms and behaviour of drugs in the human body are often crucial to gain insight into the actual effects a drug has, and may also help explain a (suspected) adverse drug reaction. Similarly, the field of toxicology is, by its very nature, closely related to pharmacovigilance and, from an organizational point of view, has been fully integrated in many countries. Many of the insights on adverse effects to drugs were provided by toxicologists.

* The paper was presented as guest lecture during VI Annual Conference of SOPI, Bangalore

Also teratology has played a significant role in this respect. Pharmacoepidemiology, the science concerned with the effects of drugs in large populations, has been another key contributor and, among other contributions, has helped establish the basis for the statistical analysis techniques and risk assessments in Pharmacovigilance. Finally, with respect to the implementation of the knowledge pharmacovigilance has helped to acquire, it is now increasingly recognised that the existing means to communicate and implement this knowledge need to be improved (5).

Regulatory pharmacovigilance

Some parties have been crucial to the development of pharmacovigilance. It has been the authorities, both at the national and increasingly at the international level, that have initially helped foster the field. Labelled as regulatory Pharmacovigilance by Waller et al., they define pharmacovigilance as 'the process of evaluating and improving the safety of marketed medicines' (6). They underlined the responsibilities the various governments have in the monitoring of drug safety, which task many national governments took firmly in hand following the thalidomide tragedy (7). It is undeniable that in several countries, most notably in the USA and UK, legislation has significantly contributed to the advance of pharmacovigilance as a specialised field of knowledge. The role of the World Health Organisation stands out here. The collaborative programme launched under the auspices of the WHO by ten countries in 1968 was the start of an historic international cooperative effort, resulting in the WHO International Drug Monitoring Programme (8). The Technical Report entitled 'International Drug Monitoring: The Role of National Centres' published as the proceedings of one of the WHO meetings in 1972, laid the theoretical and practical foundation for the further development of Pharmacovigilance (9). The programme has also resulted in the WHO Collaborating Centre for Drug Monitoring (Uppsala Monitoring Centre) which maintains the international ADR database and fulfils an important role particularly by the support it offers to the pharmacovigilance centres in low-income countries.

The role of the pharmaceutical industry

The second great influence on the development of pharmacovigilance is the pharmaceutical industry. This is not surprising since it is their product, a product they themselves have both developed and manufactured, that is the object of study. From their circles great influence has been exerted to come to international agreements, many of which have since been formalised in the various reports the Council for International Organisations of Medical Sciences (CIOMS) and the International Conference on Harmonisation (ICH) have issued. Initially, the sector's main interest laid in the epidemiological approach and causality assessment, but nowadays aspects of risk management are also given due attention.

Post marketing surveillance

Post marketing surveillance as a key activity in Pharmacovigilance In 1961 the Australian physician McBride had a letter published in The Lancet in which he suggests a connection between congenital malformations in newly born infants and the hypnotic thalidomide, which was marketed under various names in many countries. It was available both as a prescription and as an over-the-counter (OTC) drug as well as in many compositions of simple analgesics (10). Thalidomide was first synthesised in 1953 and in 1956 an intensive campaign was launched to promote the drug (under various names such as Contergan, Distavel, Softenon) first in Germany, then in England (1958) and subsequently in other countries. The number of children born with serious congenital malformations as a result of maternal use of thalidomide is estimated between 10,000 and 12,000, the majority of which were born in

Germany. Noteworthy in this context is that today toxicology and the surveillance of congenital abnormalities frequently fall outside the scope of the national pharmacovigilance centres, and have become the designated field of separate specialised organisations. McBride's appeal: 'Have any of your readers seen similar abnormalitiesà?' by which he concluded his letter, had worldwide was far greater than he could have ever foreseen (10).

Spontaneous reporting

Spontaneous ADR reporting is the main source of information for the detection of signals of drug safety hazards and should remain one of the cornerstones of a comprehensive safety monitoring programme. The great strength of spontaneous reporting is that it operates for all drugs throughout their lifetime; it is the only affordable method of detecting signals of rare ADRs, using expertise and experience of clinicians. However, Pharmacovigilance is far more than mere signal generation and it is these other aspects of Pharmacovigilance that are even more likely to prevent harmful effects to patients and the economy.

1. By continuously drawing attention to (the possibility of) adverse reactions to drugs, 'helps physicians to include suspected ADRs in their differential diagnoses at an early stage, thus expediting an appropriate response, which frequently implies that the treatment is altered or discontinued. In this way unnecessary and expensive diagnostic tests can be avoided and the time patients spend in the hospital could be shorter. The physicians' and pharmacist's awareness of adverse events is raised.

2. Raising the awareness of ADRs also is an important instrument to promote rational and safe prescription practices. Again, pharmacovigilance can help to prevent detrimental health effects and control public health expenditure. Given that only a limited number of new drugs is released every year and that today there is every reason to be conscious and economical when prescribing drugs. Apart from the drug's effects, the profile of its adverse reactions can be an important consideration for doctors in their choice of drug therapy. In other words: awareness of adverse drug reactions may significantly contribute to prudent and sensible prescription practices. This is all the more relevant since it has been shown that about half of all adverse events are avoidable (11,12).

New developments in pharmacovigilance

Pharmacovigilance started its activities in the sixties of the last century. Is has developed a lot during almost five decades and a comparable disaster has not occurred in that period.

During the last few years pharmacovigilance has received a lot of attention and these new developments are partly the reason for the increased attention. Key element is a change in risk perception: people accept fewer risks. An example are the perceived risks associated with vaccination, where one tend to forget that the diseases against we vaccinate can be far more dangerous that the slight risks associated with vaccination itself. This changing risk perception has resulted in a situation where the risk aspect of drug sometimes gets more attention then the benefits gets.

The main new developments in pharmacovigilance are:

1. a change from pre-marketing to post-marketing attention (risk management, pro-active surveillance)
2. a change from a doctor- and drug orientated scope to patient orientated pharmacovigilance
3. less regulations, more science

1. Pro-active surveillance

This pro-active surveillance is part of a new approach in pharmacovigilance also referred to as 'Risk Management Strategy' (13,14). The

basic idea is that for each product, starting with new products for which marketing approval has been applied, a product risk management plan has to be drawn up and submitted. In 2006, the Netherlands Pharmacovigilance Centre Lareb started a new, more active form of surveillance: web based intensive monitoring, designed to receive earlier information on the safety of new drugs. Intensive monitoring programs are observational cohort studies, investigating specific (new) drugs (15). For Lareb Intensive Monitoring we have developed a website based system, which automatically generates questionnaires to users of new drugs, who are identified by the dispensing pharmacist.

2. Patient orientated Pharmacovigilance

The final targets of health care are patients. They are the ones who need health care and receive pharmacotherapy. Patients benefit from drugs and experience the adverse effects of it. The latter is not something that happens exceptionally: literature is very consistent in reporting that 5% of hospitalizations are due to adverse drug reactions (ADRs) [1]. For this reason patients are worried about the safety of drugs, which can be an important reason of non-compliance. For the same reason patients should be taken seriously when they report symptoms they perceive as an ADR.

Since April 2003 patients are allowed to report experienced adverse drug reactions at the Netherlands Pharmacovigilance Centre Lareb (16). They may do so through an adjusted web form at Lareb's website. This site does require patient reporters to provide full details to allow Lareb to make a well-founded evaluation of the relationship between the suspected ADR and the drug mentioned. During the first year (April 1st 2003 till April 1st 2004) Lareb received a total of 276 reports from patients. The second year, 726 patient reports were registered (17). In general, the reports are of a good quality. Related to a more patient-orientated pharmacovigilance is the change from secrecy to transparency. At Lareb this lead to the design of our 'transparency website', started in 2005: www.lareb.nl. This website gives a complete overview of our database and a lot of information about ADRs. The website is bilingual: Dutch/ English.

3. Less regulations – more science

During the past decades pharmacovigilance has too much developed as a system of regulatory rules in order to avoid any safety risk. It is an old axiom that says that basically each drug is a poison and that it is the dose that predominantly determines its therapeutic effect.

In their 'future model of pharmacovigilance' Waller and Evans have proposed that, rather than trying to identify risks, the central theme of Pharmacovigilance should be about demonstrating safety (18). Although it seems as if they were merely toying with two sides of the same coin, there is more to it than that. The authors stress that, based on a prospective approach we first need to gain insight into the level of safety that has already been demonstrated, before we investigate any possible concerns. The benchmark should be the drugs proven safety rather than it's proven risks.

We do need to prevent Pharmacovigilance regulations from causing bureaucratic red tape: their aim should be the identification of potential risks and any subsequent measures and not meeting regulations, as is now sometime the case, for instance with the obligation to send in serious reports within 15 days, giving more attention to the time limits instead of focussing on the content of the reports. In the coming years it will be main challenge of pharmacovigilance to further define and refine its mission, its paradigm, its methodology and the implementation of knowledge in both the clinical and pharmaceutical practice.

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PRESCRIBING FOR PEDIATRIC PATIENTS

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The prescription is a written order of a registered physician to the pharmacist with direction for preparation of the prescribe drugs & their use by the patient.

The prescription is the focal-point in the physician - patient - pharmacist relationship. It serves as a communication between physician and pharmcist, both of whom share the responsibility of safe guarding the patient. The clear communication of a prescription order to other members of the health-care team and to the patient is a vital step in drug therapy. Ideally, a prescription will be written for an optimal drug product for the specific patient and indications. In pediatric prescriptions even the smallest error can be fatal. Abbreviations in prescription have the advantage of both taking history and for convenience.

The impact of development on the disposition of a given drug is determined to a great degree, by age associated changes in body composition (e.g. body water spaces, circulating plasma protein concentrations) and functions of organs & organ systems (e.g. liver for drug metabolism and kidneys for excretion). The fact that child versus adult differences exist in pharmacotherapy has led to the new discipline of pediatric pharmacology (Neonate ≤ 1 month. Infact 1 month of age; children = 2-12 yrs of age and adolescents = 12-18 yrs. of age).

It is important to recognize that changes in physiology, which characterize development, may not correspond to these age defined "break points". Infact, the most dramatic changes in drug disposition occur during the first 18 months of life where the acquisition of organ function is most dynamic. It is important to note that pharmacokinetis of a given drug may be altered in pediatric patients, consequent to intrinsic (e.g. gender, genotype, ethmity & inherited disease) and extrinsic the first two decades of life.

For pediatricians, it is essential to consider the developmental factors including physiological, psychological and pharmacological factors. These factors, alongwith differences in pharmacodynamic modialities, drug toxicity, effects of disease on drug disposition, can influence drug doses in pediatric patients. It is most useful to conceptualize pediatric pharmacokinetic, by examining the impact of development of those physiological variables that govern drug absorption, distribution, metabolism and excretion.

DRUG ABSORPTION

The rate and extent of gastro intestinal absorpiton is primarily dependent upto pH passive diffusion and motility of stomach and small intestine, both of which control transit time (Table 1).

* Head of the department ** Associate Professor S.N. Medical, Agra

Table 1 : Drug absorption in neonates infants and children

	Neonates	Infants	Children
Physiological alteration			
Gastric pH	> 5	4-2	Normal (2-3)
Gastric emptying time	Irregular		Slightly
Interstinal motility			Slightly
Intestinal surface area		Near adult	Adult pattern
Microbial colonization		Near adult	Adult pattern
Biliary function	Immature	Near adult	Adult pattern
Muscular blood flow			Adult pattern
Skin permeability			Near Adult pattern
Possible pharmacokinetic consequences			
Oral absorption	Erratic-reduced	rate	Near Adult pattern
I.M. absorption	Vairable		Adult pattern
Percutaneous absorption			Near Adult pattern
Rectal absorption	Very efficient	Efficient	Near Adult pattern
Pre-systemic clearance	< Adult	> Adult	> Adult (Rate)

Differences in the rate of drug absorption in neonates may be due to several factors, the neonate has a relative achlorhydria, longer gastric emptying time, and high level of intestinal betaglucouronidase activity (increased enterohepatic recirculation). Other factors which can influence drug absorption in neonates are irregularity of peristals is with change in transit time of drug more and variable permitability of gastro intestinal mucoasa to drug absorption e.g. Oral bioavailability of acid labile compounds beta lactam antibiotics is increased while that of weak organic acids (phenobarbitone & phenytion) is decreased. Lipid soluble drugs may be less absorbed in infants.

Bioavailability of many drugs administered by rectal route (e.g. diazepam) may be increased due to translocation across the rectal mucosa and the reduced pre-systemic drug clearance produced by immaturity of drug metabolising enzyme in the liver in early childhood.

There is very little information on hepatic first pass elimination of drugs in infants which can affect bioavailability. Since hepatic microsomol enzymes are ill developed, gastrointestinal disorders and systemic blood flow can also change drug absorption in infants. e.g. gastric emptying time and intestinal peristals is is increased in diarrhoea, which can reduce drug absorption.

PLASMA PROTEIN BINDING AND DRUG DISTRIBUTION

Drug distribution is affected by increased body water, decreased body fat and reduced plasma protein binding. The reduce plasma protein binding is not related to the levels of plasma albumin, which are similar in infants and adults.

In neonates, the free fraction of drugs, which are extensively (i.e >60%) bound to circulating plasma proteins, is markedly increased, lrgely due to reduced concentrations of drug binding proteins (i.e. fewer number of binding sites) and reduced binding affinity. We can take the example of phenytoin, which is highly (98%) bound to plama protein in adults but only 80-85% in neonates.

Poor or incomplete blood brain barrier in the neonates allows many drugs to reach CNS. Some drugs (Vit, K, Indomethacin, Sulfonamides) displace bilirubin from the albumin binding sites, and therefore much higher concenstrations of bilirubin crosses blood-brain barrier amount which may cause kemicterus in the neonates.

DRUG METABOLISM

In neonates, liver has less capacity for oxidation and conjugation reactions including glucuronidation. There fore, in general most of the enzymatic activities of metabolism of drugs are reduced. The best example of it is chloramphenicol toxicity (GRAY BABY SYNDROME) in infants & children. On the country, sulfation reaction is more active in infants and children. This may predispose to drug toxicity eg. paracetamol, as the hepatic change is induced by the toxic metabolite of paratetamol. Induction of hepatic microsomal enzymes by a variety of drugs is knowwn to occar in infants and children, as in adults. Thus drugs like phenobarbitone, carbamazepine, phenytoin or rifampicin can cause enzyme induction. Placental transfer of enzyme inducers may markedly increase drug metabolism of some drugs, like diazepam in neonares. The plasma esterases are lower in infaints, which may prolong duration of action of some drugs e.g. succinylcholine. (Table 2).

Table 2 : Drug Metabolism in the neonate, infants and child

	Neonates	Infants	Child
Physiological alteration			
Liver body weight ratio			Slighty
Cytochrome P450 activity			Slighty
Blood esterase activity		Normal (by 12 mon.)	Adult Pattern
Hepatic Blood flow			Near Adult Pattern
Phase II enzyme activity			Near Adult Pattern
Possible Pharmacokinetic consequences			
Metabolic rate			Near Adult Pattern
Presystemic clearance			Near Adult Pattern
Total body clearance			Near Adult Pattern

RENAL DRUG EXCRETION

At birth, the kidneys are anatomically and functionally immature. Renal function depends, more than on any other organ, on ges rational age and post natal adaptations.

In term neonates and in infants, glomerular filtration rates are increased dramatically during first 2 weeks of post-natal life. These change in function is a direct result of postnatal adaptations in distribution of renal blood flow. But glomerular filtration rate is much lower in neonates than in infants, children and adults Therefore, the doses and doses interval of penicillins, aminoglycosides or digoxin are required to be adjusted. The over all effect of immature metabolic and renal clearance processes are reflected as changes in the plasma half life of several drugs.

Similarly, a rapid rate ofdrug elimination has been noted for some drugs in the pre-pubertal child. Conversely,in neonates a decreased rate of drug elimination has been observed for some drugs like ampicillin, aminoglyscosides, (kanamycin, gentamycin, streptomycin etc), and digoxin. Therefore therapeutic monitoring is required for achieving and maintaining optimum drug concentration

PRESCRIBING IN PAEDIATRIC PATIENTS

Based on the different physiological factors discussed above, prescribers are required to be aware of pharmacological profile of drugs they use. In general, pediatritian must determine the most effective drug, the correct dosage form and route to be used. They also should know adverse effects, side effects, drug and the interactions of therapy contraindication cost, the compliance of patient For appropriate and

correct prescription order the following components should be kept in the mind which will provide a rational approach to prescribing drug therapy in paediatric patients.

(1) **Criteria to initiate therapy ;** Proper history of patient about the disease, previous treatment, allergies is required, selection of the appropriate drug depends upon patient's characterstics, sign, symptoms diagnosis and availability of drugs.

(2) **Doses** : represents the average range of quantities suitable for child which is to be administered within 24 hours. It is the responsibility of the prescriber regarding the amount of the drug to be prescribed. The dose is individualized for each patient by considering phannacokinetic parameters. Dose adjustments may include consideration of body weight, age, surface area, renal and hepatic ftinctions.

There are number of methods by which the dose for a pediatric patient can be calculated from the adult dose:-

(A) BASED ON BODY WEIGHT OF CHILD:-

Clark's rule

$$\text{Child dose} = \text{Adult dose} \times \frac{\text{Weight (kg)}}{70}$$

(B) BASED ON AGE OF CHILD

(a) *Young's Formula :*

$$\text{Child dose} = \frac{\text{Age (yrs)}}{\text{Age (yrs)} + 12} \text{ X Adults dose}$$

(b) *Fried Formula :*

$$\text{Infant dose} = \frac{\text{Age (month)}}{150} \text{ X Adults dose}$$

(c) *Dilling Formula :*

$$\text{Dose of child} = \frac{\text{Age (in yrs)}}{20} \text{ X Adult dose}$$

(C) BASED ON SURFACE AREA OF CHILD — Surface area is determined from the body weight and age of child. This is perhaps the most accurate method to calculate the dose for child. (Nomogram)

$$\text{Dose} = \text{Adult dose} \frac{\text{X Surface area } (m^2) \text{ X } 60}{100}$$

Some drugs may require a loading dose hi order to reach a therapeutic concentration more rapidly. Information on paediatric doses are usually provided by the manufacturer in the package insert.

Table 3 : Plasma Half- lives (h) of some drugs in neonates, infants and adults

Drugs	Neonate	Infant	Adult
Ampicillin	0.7-4.9 ++	1.6-23 +	1.0-1.8
Carbamazepine	8-28-	14-19 - -	18-55
Carbenicillin	1 .5-4.7++	1.6 +	1
Chloramphenicol	8-15+++	4-6+	23
Diazepam	25-100 ++	20-65 +	15-42
Digoxin	26-106 +	19-25 -	31-60
Doxycycline	6.9-	3.7-	12-22
Gentamicin	23-3.5+	1.7-5.4 ++	1-1.6
Paracetamol	22-5.0 +	3.0-4.5+	0.9-22
Penicillin	1.4-9.7 +++	0.9-22 ++	0.6-0.7
Phenobarbitone	40-500 ++	37-133 (-)	53-140
Phenytoin	17-104 ++	6-18-	12-29
Salicylate	4.5-11.5 ++	3-60 +	2-4
Theophylline	13-26 +	3-4-	5-10

\+ Slight increase ++Moderate increase

+++ Marked increase - Decrease

(3) **Dose Interval :** Dosing interval is basically a function of the half life of drug. (Table 3)

(4) **Route :**

The route of administration must be carefully elicited. For orally administered drugs GIT disorder like vomiting, diarrhoea must be considered. Cardio-vascular functions must be assessed, before administering drugs parenterally. Some drugs can be effectively given per rectum in infants. The prescriber must consider the absorption, distribution of drugs in plasma as differences are seen with different available routes. Rapid I/V administration to paediatric patient can result in acute toxicity.

(5) **Others:**

(A) Drugs with narrow therapeutic index require monitoring e.g aminoglycosides, antiepileptic drugs and digoxin. The paediatric patients are generally incapable of communicating specific complaints, therefore paediatrician have to depend on objective criteria for evaluating efficacy and safe of drugs certain drug, an better no used in neonates and manner for the reason of safety (Table 4).

Table 4 : Drugs Contraindicated / avoided in neonates & infants

Drugs	Remarks
Anabolic hormones	Contraindicated, stunted growth
Aminoglycosides (gentamicin, streptomycin, kanamycin, etc.)	Risk of ototoxicity and deafiness.
Aspirin	Reye's syndrome. Best avoided
Clindamycin	Severe diarrhoea
Chloramphenicol	Gray baby syndrome
Diazepam (and other BZDs)	Respiratory depression
Dicyclomine	Best avoided. Apnoea
Ethambutol	Best a voided, Visual impairment
Fluoroquinokmes	Contraindicated, Arthropathy
Fursemide	Synergistic ototoxicity with aminoglycosides
Glucocorticoids	Avoid, Stuned growth, immunosuppression
hiipramine	Avoid, Increased toxicity
Mefenamic acid	Avoid, Increased toxicity
Nalidixic acid	Avoid, Toxicity resembles fluoroquinoanes
Neostig mine	Only under cover of atropine
Nitroiiirantion	Avoid, Toxicity
Piroxicam	Avoid, Toxicity
Salbutamol	Avoid slow release preparations
Sulfi soxazole	Kernicterus in premacures
Tetra eye lines	Avoid, Toxicity
Rabies vaccine	Not effective below 1 yr. Poor immune respon.
pyrazinamide	Avoid if possible. Toxicity
Valproic acid	Avoid. Haemopietic toxicity
Verapamil	Avoid. Conduction defects

Adverse effects of drugs are peculiar in neonates and infants due to immaturity of organs and enzymes e.g. phenobarbital in an adult patient may cause sedation whereas in pediatric patients – may results in hyperactivity. Polypharmacy is a cbrhmon problem resulting from inadequate assessment of an adverse effect.

(B) Information on likely drug interactions in infants is sparse. Problems are most likely to occur when there is lack of awareness that an interaction is possible. Occasionally some interactions may be therapeutically beneficial, but mostly they result in adverse effects. For example, Phenytoin. phenobarbital and carbamazepine can interfere with the clinical effect of several drugs in the chiid. Cisapride and erythromycin administration may lead to severe life threatening cardiac complication. The prescriber should be aware of other drugs that the patient may be taking, including herbal drugs, over the counter drugs, diet etc.

(C) Patients compliance is a major continuing problem in today's society because compliance of both parents and child must be considered. There are some problems involed in drug administration to neonates. infants and young children e.g. number of drug taken taste, un willingness dosing interval, route, food intake, adverse effects, cost, parents or paints educational level (forgetting or discontinuing) effectiveness of pediatrition or pharmacist communication etc. Compliance remains a important factor and parents need to be taken into confidence and educated on the need for proper drug administration.

Thus pediatric patients can not be treated at par with adults in the provision of pharmacotherapy to the population.

The application of above steps provides an important safeguard, especially in pediatric patients for safe administration of drugs. This will benefit healthcare professionals and therefore society at large.

ABSTRACTS OF THE RESEARCH PAPERS PRESENTED AT THE SIXTH ANNUAL CONFERENCE OF SOPI, BANGALORE

ID-3

SAFETY AND EFFICACY OF CO-ADMINISTRATION OF NSAIDs PLUS PPIs

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INTRODUCTION: Gastrointestinal toxicity related to NSAID drug administration is a growing problem. Because NSAIDs are predominantly used in elderly people and as this cohort of the population is steadily growing over time, physicians are likely to encounter more people using NSAIDs who are consequently at risk of ulcer and its complications. The objective of present study is to define the safety and efficacy of co-administration of NSAIDs with PPIs.

METHOD: Clinical trail results reported, published articles, physician's letter and prescription survey.

RESULTS: Based on the present results, large clinical trials have consistently demonstrated that PPIs are more effective and better tolerated than H2-receptor antagonists and prostaglandin analogues in the prophylaxis and treatment of drug-related gastrointestinal damage in patients requiring continuous NSAID therapy. Proton pump inhibitors (PPIs) are emerging as effective and well-tolerated agents that protect the stomach and the duodenum during NSAID administration. PPIs reduce gastric acid secretion by inhibiting the proton pumps in stimulated gastric parietal cells. The effectiveness of PPIs in the management of other acid-related disorders indicates that these agents may be useful in preventing and healing gastric and duodenal ulcers caused by exposure to NSAIDs. PPIs have an excellent safety profile in patients with acid related upper gastrointestinal complaints. PPIs are indicated as the treatment of choice for healing and prevention of recurrence of ulcers in patients who are continuing with long-term NSAID therapy. Further studies are needed to confirm the observation that PPIs are also able to reduce the risk of bleeding and perforation in patients who are long-term users of NSAIDs. Because such complications are relatively rare, these trials would need to be very large to detect any treatment effect.

Conclusions: In conclusion, pantoprazole and rabeprazole as PPIs provides high efficacy and safety, with co-administration with NSAIDs, making it an attractive option in the prevention and treatment of NSAID-induced gastrointestinal effects.

ID-5

DRUG INTERACTION RELATED QUERIES RECEIVED BY THE DRUG INFORMATION CENTRE OF A TERTIARY CARE TEACHING HOSPITAL

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INTRODUCTION: Accurate information about safety of drugs is very essential for health care professionals to ensure safe use of medications. Drug information centers (DICs) provide unbiased information on drugs and related aspects.3 Clinicians seek information on drug interactions from DICs. The objective of the present study was to assess the nature of queries related to Drug Interactions (DIs) received over a period of one year by the Drug Information Center (DIC) of Kasturba hospital, Manipal.

METHODOLOGY: The study was carried out in the DIC of Kasturba Hospital (KH), a 1400 bedded tertiary care multidisciplinary teaching hospital in south India. The DIC is a part of the department of pharmacy practice, which was established in 2001 in Kasturba hospital. Retrospective evaluation of the drug information queries received in the DIC over a period of 18 months (August 2004 – Jan 2006) was done for various parameters in the query.

Drug information queries related to drug interaction was evaluated for various parameters such as department of practice of the enquirer, mode of receipt of the query, purpose of enquiry, urgency of answer needed, number of references consulted for providing the answer, number of drugs involved in the query, number of queries in which an interaction was present and, the onset and severity of the documented drug interaction.

RESULTS: Out of the 980 drug information queries received, 128 (13%) were related to drug interactions. In majority (89.9%), the enquirer wanted the information immediately and the query was from the department of medicine (75.7%). The information was seeked for better patient care in 74.2% of the queries followed by updating the knowledge (25.7%). Majority of the queries were received during ward round participation of the clinical pharmacist (72.6%) followed by telephone (25.7%). Upon evaluation of the drug interactions involved in each query, it was observed that in majority of the queries 2 references related to drug interactions were consulted (46.8%), followed by one reference (31.2%). MICROMEDEX system was used as the reference in answering most of the queries (40.9%) followed by Stockleys Drug Interaction (29.7%). Majority of the queries involved 2 drugs (57%) followed by 3 drugs (16.4%). In 53.9%, there was no interaction and in 46% there was an interaction among the drugs involved in the query. Majority (57.6%) of the drug interactions were of moderate severity followed by 35.5% of major severity. Majority (86.4%) of the drug interactions were of delayed onset and 61 % had good documentation.

CONCLUSIONS: Health care professionals utilized the information related to drug interactions to a good extend for better patient care Accurate and timely information on drug interactions is very essential for health care professionals in rational prescribing thereby ensuring safe drug use.

ID-9

SAFETY AND EFFICACY OF MISOPROSTOL AND DINOPROSTONE AS CERVICAL RIPENING AGENTS.

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INTRODUCTION: In this modern era of health care reform and cost containment, the identification of safe and cost effective therapeutic strategies for of cervical ripening and labour induction will be of great value. This study was conducted with an aim to generate and compare data regarding safety and efficacy of prostaglandin analogues misoprostol and dinoprostone as cervical ripening agent in our population.

METHODS: Patients with a term, vertex, singleton pregnancy and a Bishop score of 4 or less were randomly assigned to receive misoprostol pessary (n = 35, 50 μg intravaginally) or dinoprostone gel (n = 31, 0.5 mg intracervically) at 6 hourly intervals. Patients were monitored throughout the period. If there is no progress in cervical dilatation or effective uterine contractions even after maximum dose of dinoprostone or misoprostol, patients were taken to cesarean section operations. Patients who achieve Bishop's score more than 7 but the delivery was not progressing, were augmented with oxytocin drip.

The measures of safety noted included the presence of contraction abnormalities, fetal heart rate abnormality, meconium passage, 1 and 5 minutes Apgar score, admission to neonatal intensive care unit and maternal side effects.

RESULTS: No uterine hyperstimulation was observed in both groups. However, abnormal fetal heart rate was observed in 3(8.6%) cases in misoprostol group and 2(6.5%) in dinoprostone group. There was no statistically significant difference in meconium passage in two groups. Apgar score less than 7 at 1 minute was seen in 6(19.4%) and 11(31.4%) neonates in dinoprostone and misoprostol group respectively. However Apgar score less than 7 at 5 minutes was found in only one neonate of dinoprostone treated patient.

Both drugs were found to be equally effective in improving Bishops score. No significant difference was seen in the mean induction to delivery time in dinoprostone and misoprostol group. Cesarean section operations occurred in dinoprostone and misoprostol groups were 32.3% and 28.6% respectively. There was significant reduction in the need for oxytocin augmentation in misoprostol (37.1%) group than in dinoprostone (67.7%) group.

Our results indicate intravaginal misoprostol to be equally effective agent for cervical ripening and labour induction as dinoprostone. The difference in the mean bishop score obtained 6 and 12 hours after administration of initial dose was not statistically significant between two groups. Mean preinduction to delivery time was 17.99 ± 14.0 hrs in misoprostol and 17.19 ± 10.7 hrs in dinoprostone group. More than 45 randomized trials including more than 5400 women have found vaginal misoprostol to be more effective than dinoprostone and oxytocin. We had no case of hyperstimulation. Our result indicates that instead of repeating the dose of misoprostol at 3– 4 hourly intervals, it is better to wait for 6 hours. 50 μg misoprostol at 6-hourly intervals appear to be a better choice than early repeated dosages.

Our study also found that there is no statistically significant difference in mode of delivery in two groups. 32.3% and 28.6% patients went for cesarean section operation from dinoprostone and misoprostol group respectively. Misoprostol 50 μg 6-hourly was found to be an effective cervical ripening agent with no maternal adverse effects such as tachysystole, uterine hyperstimulation or uterine rupture. The neonatal outcome was found satisfactory and comparable with dinoprostone group. However, one patients from dinoprostone group delivered baby with Apgar score less than 7 at 5 minutes whereas no such case was seen in misoprostol group. Both of the cervical ripening agents had no serious side effects to both mother and baby. Difference in the frequency of abnormal fetal heart rate and meconium passage was found to be statistically insignificant in both groups. Abnormal fetal heart rate was observed in 2(6.5%) and 3(8.6%) cases in dinoprostone and misoprostol group respectively. But this difference was found to be statistically insignificant (P=0.74). 7(22.6%) in Dinoprostone and 8(22.9%) in misoprostol group showed meconium passage. So, undesirable fetal effects were found comparable with both of the cervical ripening agents.

CONCLUSIONS: Vaginal misoprostol is an effective, safer and cheaper alternative to dinoprostone as a cervical ripening agent in underdeveloped countries with poor socioeconomic condition.

ID-10

PATTERN OF ADVERSE DRUG REACTIONS DUE TO CANCER CHEMOTHERAPY IN A TERTIARY CARE TEACHING HOSPITAL IN NEPAL

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INTRODUCTION: Use of cancer chemotherapeutic drugs is associated with several adverse drug reactions (ADRs) ranging from mild nausea to fatal myelosuppression. Data regarding safety profile of cancer chemotherapy is lacking in Nepal.

OBJECTIVES: To study the pattern of ADRs caused by cancer chemotherapeutic drugs in Manipal Teaching Hospital (MTH), Pokhara, Nepal.

METHODS Hospitalized patients treated with cancer chemotherapy drugs from 1st January to 30th June 2006, was studied retrospectively. Necessary information was collected from the patients' hospital records.

RESULTS: Total 60 patients underwent chemotherapy among which 25 (41.67%) developed ADRs. More than half (60 %) were male and 40 % were of age group 61-70 years. More than half of the patients (56%) who developed ADRs were on adjuvant chemotherapy. Alkylating agents were responsible for the ADRs in nearly half of the patients (52%) followed by antimetabolites (20%). Cisplatin was the individual drug responsible for 44% of the ADRs. The onset of the ADR was within a day in 44% of the patients.

Thirty six percent of patients developing ADRs stayed in the hospital for 1-4 days. Hematological system was affected primarily (40.47% of the patients), followed by the gastrointestinal tract (33.33%). Grade I neutropenia was the most common ADR affecting 28.6% of the patients, followed by emesis (21.4%). Increased dose of antiemetics was needed in 38.5% of the patients to manage the ADRs. Levamisole was the drug used primarily (38.9%) for managing ADRs.

CONCLUSIONS: Similar studies covering more patients form different regions are needed to validate our findings.

ID-11

SAFETY AND EFFICACY EVALUATION OF AMLODIPINE AND ENALAPRIL IN NEPALESE POPULATION

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INTRODUCTION: Hypertension is currently among the leading cause of morbidity and mortality throughout the world. About half of the world's cardiovascular burden is predicted to occur in Asia Pacific region. The prevalence of hypertension in Nepal at present is 19.7%. Studies comparing the safety and efficacy of commonly prescribed antihypertensive amlodipine and enalapril are lacking in Nepal.

METHODOLOGY: We conducted a prospective, randomized study in two Nepalese hospitals to compared the mean reduction in Blood Pressure (BP) and pulse rate along with the Adverse Drug Reactions (ADRs) caused by amlodipine and enalapril during September 2005 to July 2006. Seventy two newly diagnosed primary hypertensive patients (36 in amlodipine and enalapril) were followed for 4 weeks during which their BP and pulse rate were recorded at 0, 1, and 4 weeks and ADRs were also documented.

RESULTS: The median age of the study population (male 38 and female 34) was 46.5 years and 44.44% of the females were housewives. Sixty percent of them had not completed their school education and 91.67% were non-vegetarians. Half of the study populations were either current or past smokers. Among them 5.56% patients were diabetic and

26.39% patients had a family history of hypertension. Nearly 28% patients were taking alcohol and 19.44% had a high salt intake. Only 5.6% found to be performing adequate physical activity.

In this study, enalapril decreased systolic / diastolic BP from the initial mean BP 162.11 (±22.02)/ 103.11 (±11.49) mm Hg to 134.06 (±14.66) / 86.33 (±8.77) after 1 week, which was statistically significant (P = 0.000, 0.000) and reduced to 131.28 (±11.40) / 85.17(±8.12) mm Hg after 4 weeks which was not statistically significant (P=0.131, 0.271). Similarly, amlodipine reduced from 158.22 (±16.22) / 100.28 (±7.26) mm Hg to 138.31 (±12.74) / 89.86 (±8.99) after 1 week, which was statistically significant (P = 0.000, 0.000) and to 132.64 (±11.65) / 87.25 (±8.44) mm Hg after 4 weeks which was also statistically significant (P = 0.000, 0.008). The reduction in BP were more in enalapril group but was not statistically significant (P = 0.618, 0.289) compared to amlodipine group.

Enalapril decreased the pulse rate from 77.39 (±13.18) to72.53 (±8.16) beats per minute (bpm) which was statistically significant (P = 0.004) and to 72.78 (±6.35) bpm after 4 weeks, which was not significant statistically (P =.803). Similarly, amlodipine decreased pulse rate from 79.61 (±14.19) to 77.31 (±11.05) after 1 week and to 76.83 (±8.52) bpm after 4 weeks which was not statistically significant (P = 0.071, 0.556). The reduction in pulse rate was more in enalapril and was statistically significant (P = 0.041, 0.025). Dry cough, nausea and dizziness were the major ADRs in enalapril; whereas, peripheral edema, nausea and shortness of breath in amlodipine group. Patients in amlodipine group experienced more number of ADRs and two patients needed a change in drug therapy due to ankle edema.

CONCLUSIONS: Both the study drugs were equally effective in terms of BP reduction and enalapril was better tolerated in Nepalese population.

ID-13

PHARMACOVIGILANCE ON RABIES IMMUNOGLOBULINS ADMINISTRATION

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INTRODUCTION: Rabies has been the object of human fascination, torment and fear since the disease was recognized in antiquity. Identification of adverse reactions during post exposure prophylaxis of rabies immunoglobulins would be helpful in improving the quality of life of the recipient and to prevent further hospitalization. This study is a small step in this direction. The objective of the present study was to find out the various adverse reactions during post exposure prophylaxis of rabies immunoglobulins and to find out the socio demographic details of host as well as carriers.

METHODOLOGY: A retrospective study was conducted in 1000-bedded tertiary care teaching Hospital, Anti Rabies Preventive Medicine Department, KIMS Bangalore. The data was collected for a period of three and a half years from June 2003 to December 2006 based on the records and data stored in the department.

RESULTS AND DISCUSSIONS: Overall 1316 cases were analyzed of which 889(67.55%) were male and 427(32.45%) were female patients who received the rabies immunoglobulins. 975(74.10%) were from urban area, 1107(84.12%) were employed, 864(65.65%) patients had a low income of upto 5000. Maximum incidence of bite was during day time 979(74.39%) and on road bites

accounted for 941(71.50%), 795(60.41%) of bite was unprovoked bite. 906(68.84%) was stray bites; and the pet: stray dog ratio was found to be 1:2. Equine rabies immunoglobulins was administered to 1240(94.22%) and 126(11.61%) members experienced and reported adverse reactions. Anaphylaxis, generalized pruritis, giddiness, local itching, local pain, local swelling, urticaria, maculopapular rash, fever, headache, drowsiness, body pain and myalgia were the common adverse reactions being reported.

CONCLUSIONS: The study helps to identify the adverse reactions of rabies immunoglobulins so that further precautions can be taken by giving proper counseling and treatment to improve the quality of life of the recipient.

ID-14

AN INVESTIGATIONAL STUDY ON THE CLINICAL PROFILE, DRUG THERAPY AND TREATMENT ADHERENCE OF HYPERTENSIVE PATIENTS IN AN URBAN SETTING

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INTRODUCTION: Hypertension is a common, chronic, age-related disorder, which often leads to debilitating cardiovascular and renal complications. It is among the leading causes of cardiovascular diseases worldwide. There are many predisposing factors and different group of antihypertensive drugs for the effective treatment. The present study was conducted with the objectives of studying the patients' clinical profiles, drug therapy and treatment adherence.

METHOD: The study was conducted in two hospitals; Fishtail Hospital and Research Centre (Pvt.) Ltd, Gairapatan-4, Pokhara and Western Regional Hospital (WRH), Pokhara, Nepal during 1st May to 4th June 2006. Hypertensive patients visiting the study hospitals were interviewed using a self developed questionnaire. Unconscious and severely ill hospitalized patients were excluded.

RESULT: A total of 210 subjects were analyzed. The study showed that hypertension was higher in female and the age group 46-55 years was higher in number. Housewife were been the highest (45. 24%). Majority (87.62%) of the patients was non-vegetarians and 59.52% of the total patients were taking parallel medications with Ranitidine being the common one (8.92%). In the total prescription 38.57% of the prescriptions contained 2 drugs per prescription. Among the antihypertensive drugs, Amlodipine and Atenolol were prescribed in 23.26% and 23.7% of the patients respectively. Diabetes was the commonest comorbid condition. Nearly two third and 64.28% of the patients were adhering to medication.

CONCLUSION: Females had a higher incidence of hypertension. Atenolol and Amlodipine were the commonly prescribed drugs. Similar studies covering larger sample size are needed to confirm our findings.

ID-15

IMPACT OF EDUCATIONAL AND MANAGERIAL INTERVENTION ON IMPROVING RATIONAL USE OF MEDICINES - RESULTS FROM A TERTIARY CARE TEACHING HOSPITAL IN NEPAL

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INTRODUCTION: Irrational drug use is a common problem in developing countries like Nepal. The objective of the project study was to evaluate the impact of educational and managerial intervention on improving rational

use of medicines in a tertiary care teaching hospital. Adverse drug reactions (ADRs) are one of the outcomes of irrational medicine use. The most common type of ADRs is dose-dependent and predictable and usually occurs as a result of drug-drug, drug-disease or drug-food interactions and, therefore, could be preventable. Lack of educational programs for the doctors and pharmacists, improper dispensing practices further worsen the drug use pattern in developing countries like Nepal. The objective of the present study was to evaluate the impact of educational and managerial intervention on improving rational use of medicines in a tertiary care teaching hospital.

METHODS: The cross sectional study was carried out at Manipal Teaching Hospital (MTH), Pokhara, Nepal in two phases (247 patients each). The Pre-intervention phase (10th June to 19th August 2004) analyzed the out patient prescriptions for rational prescribing and dispensing using INRUD indicators. Following this, intervention was carried out through Drug and Therapeutics Committee (DTC), detection of medication errors, continuing pharmacy education (CPE) and personnel discussion with the pharmacists. Two years after, the post-intervention phase with the same type of patient distribution pattern was carried out.

RESULTS: Average drug per prescription was 2.91 (pre-intervention) and 2.53 (post-intervention). Generic prescribing was 15% (pre-intervention) and 16.38% (post intervention). Fixed dose combinations were 21.67% (pre intervention) and 18.08% (post-intervention). Before intervention 40% drugs were from the Essential drug list (EDL) of Nepal and 29.44% from the WHO EDL. After intervention, 37.09% and 31.06% were from the Nepal and WHO EDLs respectively. The average cost per prescription was 241.11 Nepalese rupees (US$ 3.25) (pre-intervention) 224.83 (3.03 USD) (post intervention). The labeling of the medication envelopes improved to 100% following the intervention. Before intervention, only 53.8% knew both the duration of the therapy and administration time of drugs which increased to 100% after the intervention.

CONCLUSION: Multidisciplinary educational intervention can improve rational use of medicines in hospital settings.

ID-18

PATTERN OF DRUG INTERACTIONS IN INTERNAL MEDICINE WARDS OF MANIPAL TEACHING HOSPITAL, POKAHARA, NEPAL

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INTRODUCTION: Drug-drug interaction (DDI) is known to be an important cause of adverse drug reactions (ADRs). The objective of the present study was to categorize the DDIs based on their severity, onset, and documentation status and to study the association of DDIs with various parameters like age, sex, smoking, alcohol consumption disease state, number of drugs per prescription, patient history etc.

METHODS: A prospective study was conducted for 3 months in Medicine wards of, Manipal Teaching Hospital, Pokhara Nepal. Admitted patients were followed during their hospital stay and details were entered in a structured patient profile form. Drug interaction details were analyzed using 'Micromedex' software.

RESULTS: Out of 435 patients admitted, 229 (53.0%) of them had at least one DDI and nearly half (53%) of them were males. Age group 71-80 years experienced 69% of the DDIs. Smokers and alcoholics were found to encounter 66% and 57% of DDIs respectively. Nearly one third (36%) of the DDIs occurred

in patients with cardiovascular diseases. The average number of drugs per prescription of the patients who encountered DDIs was 8.53. Majority of the DDIs were 'moderate' and 59% had a delayed onset. Documentation status was good in 70% of DDIs. Pharmacokinetic mechanism was responsible for 45% of the DDIs. Furosemide responsible for 9% of the DDIs. The DDI between calcium channel blockers and beta blockers was the commonest (6%). A total of 355 (29%) drugs were found to be of narrow therapeutic index.

CONCLUSION: More extensive and interventional studies may minimize the occurrence of DDIs.

ID-20

SAFETY EVALUATION OF ANTITUBERCULAR THERAPY UNDER REVISED NATIONAL TUBERCULOSIS CONTROL PROGRAMME

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INTRODUCTION: The World Health Organization declared tuberculosis a global emergency in 1993. To intensify the efforts to control TB, Government of India gradually replaced NTP by the Dirctly Observed Treatment Short cou.se (DOTS) programme and is known as Revised National TB control programme (RNTCP). The present study was carried out to evaluate the safety of DOTS therapy by monitoring ADRs. All the patients of TB admitted in department of tuberculosis and respiratory diseases, DOTS center Manipal and Udupi were enrolled as per the study criteria and were monitored for ADRs.

METHODOLOGY: The prospective study was conducted over a period of eight months at Dept. of Tuberculosis and Respiratory Diseases, DOTS center Kasturba Hospital, Manipal and DOTS center Government Hospital, Udupi. All the patients who are on DOTS are included for the study and patient performa of all these patients were maintained. These patients were monitored for ADRs from their day of admission to day of discharge and follow-up was done during each visit. ADRs were identified by various methods. Reported ADRs were documented in the reporting form, documentation form and monitoring chart of ADRs. These ADRs were evaluated for the following parameters like gender, age, distribution of ADRs as per type of DOTS treatment, most common ADRs, predisposing factors, type of ADRs, time of onset, management, outcome, patter of dechallenge and rechallenge, number of drugs involved in reported ADRs. ADRs were also evaluated for causality (WHO probability scale, Naranjo's algorithm), and severity (Hartwig et. al).

RESULTS: Of the 94 patients, a total of 21 ADRs were reported from 16 patients. Majority of them were males and falling into the age of group 18-40 years. Most of the patients were of new types (43.61%), 96% cases were of pulmonary tuberculosis and remaining were of extra pulmonary tuberculosis. 56% patients were started on category II DOTS treatment. Out of 94 patients 87 patients were transferred to their local DOTS center. The overall incidence of ADRs was 17.02%. More ADRs were observed in males (95%). Most of the patients below the age of 60 years were affected by ADRs (18). As per distribution of type of DOTS treatment CAT II comprise of 47%. Most commonly reported ADRs were gastritis (33.33%) followed by skin reactions (14.28%) and hepatitis (9.52%). Multiple drug therapy was the most common predisposing factor. 6(28%) were of Type A and remaining were of Type B. 76.18% of ADRs occurred within first four weeks of the treatment. Management of ADRs by withdrawing drug was done only in 3 cases and whereas in other cases drugs are continued. Upon causality assessment it was found that

most of the ADRs belonged to category 'possible' according to WHO probability scale (47) and Naranjo's scale (54). 51% of ADRs were of moderate severity and belongs to Level-3 and 49% of the ADRs were of mild.

CONCLUSIONS: Although incidences of ADRs were high as 17.02%, most of them were mild and moderate, which shows that DOTS therapy, is safer as compare to daily regimen. However monitoring of ADRs is needed for drug safety and patient compliance in DOTS.

ID-21

PRESCRIBING PATTERN AND PHARMACOECONOMICS OF SELECTIVE SEROTONIN RE -UPTAKE INHIBITORS IN PSYCHIATRIC PATIENTS

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Introduction: The current complexity of civilization, the rapidity of change and the loss of some traditional religious and familial values are creating new conflicts and anxiety leading to depression for individuals. Anxiety is most common problem in psychiatry ,the current and one year prevalence rates have been reported to be 3.2 % and 8.4% respectively. Selective serotonin reuptake inhibitors (SSRIs) are the choice of drugs used these days in anxiety and depression. Therefore, an epidemiological and pharmaco-economic study of this class of drugs in outpatients department of psychiatry, was undertaken by department of pharmacology, S. N. Medical college, Agra.

METHODOLOGY: A total of 507 patients were randomly examined, out of which 76 (Approx. 15%) patients were diagnosed to be under depression. Out of these 76 patients 44 patients (Approx. 58%) were prescribed SSRIs. From these 44 patients 20 patients were prescribed Sertaline (Tab. Zosert, 50 mg., OD, HS, Cost Rs.2.60/tab.) and 10 were given Fluoxetine (Tab. Prodep, 20mg. OD, HS, cost Rs. 2.50/tab). Amitriptyline (Tab. Tryptomer, 25mg., OD, HS, Cost Rs. 2.16/tab) and Dothiepin (Tab. Doreme, 25mg, OD, HS, Cost Rs. 1.22/tab) were prescribed to 5 patients each. The Escitalopran (Tab.Nexito, 10 mg., OD, HS, Cost Rs. 5.27/tab.) was prescribed to 4 patients.

RESULTS AND CONCLUSION: All patients on any of 5 drugs had almost the same complaints. In the study 92% patients complained of sexual disturbances, 65% of gastritis and 42% had anxiety. As only one dose was required per day, the pharmacoeconomics was not a matter of concern to the patients except the patients on Escitalopran which was twice as costly as other drugs.

ID-26

LYCHEE JUICE INERACTION WITH QUINOLONES

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INTRODUCTION: Lychee juice produces mechanism-based inhibition of intestinal drug metabolism when consumed in normal quantities. This can produce clinically important increases in oral drug bioavailability when co-administered with substrates of cytochrome P450 3A4 (CYP3A4) that undergo high presystemic metabolism. Lychee juice is a well-known potent inhibitor of cytochrome P450 3A4 activity. Our aim is to develop a model based on mean residence time for better understanding the effect of lychee juice on the metabolism of quinolones.

METHODOLOGY: Owing to clinical relevance of lychee juice-drug interactions, an investigation of drug interactions of two quinolones, ciprofloxacin and ofloxacion with lychee juice was studied in vitro at human body temperature. These experiments were carried

out with different concentrations of juice ranging from 1–10 % and aliquots were analyzed for the drug content by UV spectrophotometric and HPLC-UV technique. As all the fruit juices contain ascorbic acid in them, the potential interaction of ascorbic acid with these drugs was also assessed simultaneously.

RESULTS: This study shows that lychee juice increases the drug concentration of quinolones substantially thereby interfering with its metabolism. It is likely that lychee also contains cytochrome P450 (CYP3A4) like grape fruit and many other juices, which is involved in the metabolism of quinolones. In case of both quinolones, ascorbic acid was also depleted indicating formation of charge transfer complexes. The binding capacity of both quinolones were of the order of Ciprofloxacin> Ofloxacin.

CONCLUSIONS: In order to avoid such drug interactions, it is recommended not to co-administer these drugs with lychee juice.

ID-33

ADVERSE DRUG REACTION MONITORING AND EVALUATION AT A PRIVATE CORPORATE HOSPITAL

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INTRODUCTION: The occurrence of adverse drug events in hospitalized patients can lead to an increase in the length of hospital stay and to excess costs. In order to prevent the adverse outcome of drug therapy insight into the occurrence of adverse drug events during hospitalization is important. The objective of the present study was detection and documentation of suspected Adverse Drug Reactions Assessment of Severity, Predictability, Preventability and Causality of the suspected Adverse Drug Reactions Active reporting of Suspected Adverse Drug Reactions, issue of alert card and guideline preparation to minimize the incidence of ADR.

METHODOLOGY: A prospective study was made on the patients admitted in the department of General Medicine of the study Hospital, over a period of 6 months. The study was divided into three phases, the first phase included detection and documentation of the Adverse Drug Reaction, and the second phase included assessment of severity, predictability, preventability and causality of the noticed Adverse Drug Reactions, and the third phase is reporting to the physicians of the study department. An ADR reporting form was designed to aid reporting and collection of ADR and was taken for regular ward rounds in General, Special and Deluxe wards of the department of general medicine along with the Physicians by the author. Alert cards were prepared and given to patients of high risk. The causality relationship between the ADR and the suspected drug therapy was assessed using the Naranjo algorithm and WHO scale. Severity, Preventability, and Predictability were also assessed using standardized Scales.

RESULTS AND DISCUSSION: Of the total 21 adverse drug reactions reported 8 (32%) were hospitalized due to an adverse reaction as compared to 13 (62%) that were affected by after hospital admission. System most commonly affected by adverse reaction was the skin in 8 (39%) and gastrointestinal system in 6 (29%) patients. The drug class mostly associated with adverse reaction was NSAIDs in 10(48%) patients followed by Antibiotics in 3 (15%). Causality assessment was done using the Naranjo and WHO scales. The results interpreted using Naranjo scale reveled that in 1 (5%) patients the reactions was definite, probable in 18 (86%), possible in 2 (10%) while that using WHO scale were 1 (5%) certain, 16(77%) probable, and 4 (19%) possible. Rate of reporting by various health professionals were observed as Physicians

13 (62%), 7 (34%) by Pharmacists and 1 (5%) by nurses. As part of the management in 19 (91%) of the cases the drug was withdrawn, dose altered in 1 (5%) of the cases and no change was made in1 (5%) cases. Adverse reactions encountered were treated and the final outcome was measured. About 16(77%) of the patients recovered, while in 5 (24%) of the cases the adverse reactions decreased. No fatal cases were reported. The results obtained by the study were compared with other foreign studies and literatures and observations were made.

CONCLUSIONS: Active reporting of ADRs from individual hospital settings by the clinical pharmacists should be made mandatory to ensure rational drug therapy and complete patient care. In near future the Clinical Pharmacists will play a vital role in assimilating the data regarding the adverse reactions to drugs. This can be successfully achieved if a continuous monitoring of adverse events is practiced. Each and every hospital will ultimately need a clinical pharmacist to maintain database on ADRs and function as a mediator between the physician and the patients, to ensure rational drug use.

ID-37

INFLUENCE OF CYP2C9 POLYMORPHISM ON PHENYTOIN TOXICITY IN INDIAN EPILEPTIC PATIENTS

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INTRODUCTION: Phenytoin is a very commonly prescribed drug for epilepsy. It is metabolized in the body by CYP2C9, a cytochrome 450 enzyme located in the liver. It has been reported to cause side effects like ataxia, nystagmus, gingival hyperplasia at toxic doses. However in some patients these side effects appear at normal doses. CYP2C9 has been shown to exhibit polymorphism. It's activity may be decreased in some subjects leading to enhanced toxicity of drugs metabolized by this enzyme. So theoretically patients who are poor metabolisers with respect to CYP2C9 activity may have phenytoin toxicity. To the best of our knowledge, no studies have been reported regarding the influence of CYP2C9 genetic polymorphism on phenytoin toxicity in Indian epileptic patients, as this population ethnically differs from other population groups. The objective of the present study was to find out the frequency of mutant variants of CYP2C9 gene in South Indian epileptic patients and to study the influence of CYP2C9 genetic polymorphism on phenytoin toxicity

MATERIAL AND METHOD: The study was done in 186 patients (123males and 63 females) who were taking phenytoin for the treatment of various types of epileptic seizures. The clinical diagnosis of phenytoin toxicity was made based on the neurological signs of toxicity (headache, drowsiness, giddiness, ataxia, nystagmus, difficulty in walking, diplopia) and gingival hyperplasia. The degree of gingival hyperplasia was recorded according to the following criteria grade 0: no sign of gingival overgrowth, grade1: overgrowth covering the cervical third or less of the anatomic crowns of the anterior teeth, grade2: overgrowth extending anywhere in the middle third of the anatomic crowns of the anterior teeth, and grade3: overgrowth covering more than two thirds of the of the anatomic crowns of the anterior teeth. A sample of 6 ml blood was collected for measurement of plasma phenytoin level. Genomic DNA was extracted from the peripheral leucocytes using standard phenol chloroform method. The DNA samples were analyzed using polymerase chain reaction (PCR)-restriction fragment length polymorphism (RFLP) method. PCR amplification of Arg144Cys (CYP2C9*2) and Ile359Leu (CYP2C9*3) variant alleles was done using the forward and reverse primers. The amplified

PCR products were digested with Ava II , Nsi I enzyme and separated on a 8% polyacrylamide gel. The plasma concentration of phenytoin was determined by a modified HPLC method. A liquid-liquid extraction method was used for preparation of sample. An LC-10AD Pump was used. The drug was separated on a C18 column with a mobile phase of methanol, acetonitrile and phosphate buffer (21:14:65, pH 7.4) at a flow rate of 1.5 mL/min. Sample detection was done using a UV detector set at 196 nm (Range 0.005 Aufs, SPD-10Avp detector).

RESULTS: Of the 186 patients, 41 patients were clinically diagnosed to have phenytoin toxicity. Patients with phenytoin toxicity had significantly ($p<0.005$) higher level of phenytoin concentration and dose corrected phenytoin concentration (C/D) than with patients without toxicity. There was significant difference in frequency of mutant alleles of CYP2C9 between patients with and without toxicity ($p<0.005$). There was significant association between the genotype and plasma phenytoin concentration and between genotype and C/D. When compare with wild type genotype, individual with mutant allele particularly CYP2C9*3 have 4 times risk to develop phenytoin toxicity.

CONCLUSIONS: There was significant influence of CYP2C9 genetic polymorphism on phenytoin toxicity. Hence, Screening of CYP2C9*3 allele will help in preventing phenytoin toxicity.

ID-43

ADVERSE REACTIONS TO ANTIMICROBIALS

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OBJECTIVE: To determine the number and nature of suspected adverse drug reactions (ADRs) associated with antimicrobials.

MATERIALS AND METHODS: The Pharmacovigilance cell, department of Pharmacology from January 2006 to August 2006, carried out the study. The details of the patients manifesting with reactions to antimicrobials were collected both from inpatient and outpatient departments of R.L.Jalappa hospital attached to Sri Devaraj Urs Medical College. The parameters included patient age groups, sex, indications for antimicrobials, type of reaction and the outcome of these reactions. The causality assessment of the ADRs was done as per the directions provided by WHO collaborating centre.

RESULTS: The number of adverse reactions to antimicrobials reported was 31. Age distribution is as follows: 16% in pediatrics (0-18years), 80% in adults (19-60years) and 3% in geriatric (>60years). Males were 12 in number and females 19. The antimicrobials, which caused adverse reactions in our study were fluoroquinolones (36%), cefixime (13%) and other cephalosporins, INH (13%), ampicillin+cloxacillin (7%) and macrolides (7%). The most common indication for the use of these antimicrobials was upper respiratory tract infection. Antimicrobials caused both cutaneous and systemic ADRs. The cutaneous and systemic ADRs observed were 77% and 23% respectively. The most common manifestation was maculopapular rash (79%) in which fluoroquinolones contributed to 42% followed by cefixime 21%. Vasculitis (9%) was due to ampicillin+cloxacillin and Ceftazidime. Stevens – Johnson syndrome (SJS), erythema multiforme and drug induced photo aggravated melanoderma was caused by cotrimoxazole, INH and dapsone respectively. Among systemic ADRs, insomnia (44%) was most commonly seen due to ofloxacin. Prolonged QT interval by fluconazole, increased SGPT/SGOT and altered liver function tests by INH. Maculopapular rash subsided within 2-3 days, vasculitis in 3-4 days, prolonged QT interval and erythema multiforme in 5 days, SJS in 6 days. By causality assessment,

52% were probable and 48% possible.

CONCLUSION: In our study, antimicrobials contributed to both cutaneous and systemic ADRs. Cutaneous ADRs were more common followed by systemic. Cutaneous manifestations were in the form of maculopapular rash, which subsided within 2-3 days. Interestingly, systemic unwanted effect we observed was insomnia due to ofloxacin. Majority of the reactions were probably due to the drug.

ID-49

DEVELOPMENT OF COMPUTER BASED SELF-HELP TOOL ON MEDICINE FACTS

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Summary

INTRODUCTION: Information technology (IT) is concerned with the use of technology in managing and processing information. Pharmacy with its huge database of information is an ideal field for the use of IT. More and more effort is being made to compile and store the data on medicine in a way which will help its easy access and retrieval. Packages like Micromedex, IBase, IOWA are an attempt towards this. But the students are still in need of easy and affordable databases. We are here attempting to do the same by questioning the student's knowledge on medicines. Objective of the study were to help the students of pharmacy assess their knowledge about medicines and to help clinical pharmacists use their knowledge skillfully in their field of work.

METHODOLOGY: In this study, softwares Visual Basic 6.0 and Oracle 9.i are being used. The front-end has been created with the use of Visual Basic 6.0 which works hand in hand with Oracle 9.i, which is one of the most sophisticated backend tool. The information for the database has been obtained from authorized books such as Harrisons Principles of Medicine, Herfindal's Textbook of Therapeutics, and American Hospital Formulary System (AHFS). The study poses a set of 15 to 30 questions on the medicines at time. The student has to fill in the Category, Adverse Drug Reactions, Medicine Interactions for the medicine in question. On submitting, the answers will be scrutinized and the score will be displayed in the end.

RESULTS: The outcome of the study is to assess and improve an individual's knowledge.

CONCLUSION: Medical database is huge and increasing day-by-day with new medicines being added everyday. With this package, we aim to help the future pharmacists in assessing their knowledge about medicines.

ID-51

ROLE OF PHARMACIST IN IMPROVING THE QUALITY OF TREATMENT IN INPATIENT

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ABSTRACT: Medicines are probably the most commonly used form of medical intervention globally. People now a days are prescribed multiple medications for any ailment, sometimes inappropriately, hence ensuring that a patient gets maximum benefit from medication, has become a major challenge to health care professionals. A clinical medication review is a structured, critical examination of patient's medicines with an objective of reaching an agreement with the patient about treatment, optimizing the impact of medicines, minimizing the number of medication related

problems and reducing waste. Other issues, such as compliance, actual and potential adverse ffects, interactions and the patient's understanding of the condition and its treatment also considered. This study is initiated by the students of Department Of Pharmacy Practice in two hospitals where clinical pharmacy

services are provided. This study is a part of an on going process, to delve into issues such as impact of medicines. A total of 41 cases (10 from Victoria Hospital and 31 from St. Martha's Hospital) have been collected during ward rounds from 15th September to 28th September. A thorough review of each case is done by clinical pharmacists, by checking the relevance of medication regimen prescribed with the diagnosis. Results in the study indicate that review of the prescribed medication by clinical pharmacist can improve patient outcomes by helping the prescribers to make more informed decision about therapy undertaken as well as to the patients by counseling them to manage their medication better.

INTRODUCTION: The role of pharmacists is developing rapidly to meet the needs of modern healthcare system, equally important is to advice other healthcare professionals on safe and rational use of medicines and to accept responsibility to ensure that medicines are used safely and effectively by those to whom they are prescribed so that maximum therapeutic benefit is derived from the treatment. Medication chart Review by a clinical pharmacist can improve patient care by reviewing drug treatment and making relevant drug changes. The objective of the study was to find out if we can minimize the medication errors to prevent drug-drug interaction and adverse drug reactions.

METHODOLGY: This study is an ongoing study of 7 weeks which started from 15 September 2006. The cases were collected randomly from medicine ward of St Martha's hospital and Victoria hospital during the ward rounds. Patient's medication charts were reviewed and drug history interview were conducted reading through the medication chart particular attention was given to the following sections,

- Procedure notes: (diagnostic) to look at the narrative sections for correlation with symptoms.
- Physician progress notes: for indication in any changes in plan of care related to effects of medications,
- Laboratory reports: looking for laboratory results indicating the disease and progress of disease,
- Physician orders: to correlate with the symptoms and indications. Discharge counseling was done to patients regarding their medication and diet.

RESULTS: A total of 41 cases (10 cases from Victoria and 31 cases from St Martha's hospital) were collected during ward rounds; a thorough review of each case was done, with aim to know the relevance of the medications with the diagnosis. Following was observed from the study: 6 cases were found for which treatment of the patient does not correlate with the indication, in 7 cases doctor had prescribed drugs without indication, in 4 cases dose and duration were not specified, in 8 cases drug-drug interactions were cited, in 2 cases the symptoms did not correlate with indication, in 6 cases the laboratory investigations was not conducted to confirm the indication, finally 3 cases had no detail discharge summary.

CONCLUSIONS: Patient outcomes can be positively affected by the pharmacist identifying drug related problems, monitoring treatment outcomes, individualizing medication regimens and minimizing the risk of medication errors via medication chart review. The role of pharmacist in the health care system is vital in promoting the quality use of medicines, as they are the "medication managers".

ID-58

A SURVEY ABOUT THE KNOWLEDGE , ATTITUDE AND PRACTICE OF ADVERSE DRUG REACTION REPORTING AMONG DOCTORS IN BANGALORE CITY.

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INTRODUCTION: The national pharmacovigilance programme will complete two years of its existence on November 23, 2006. The short term objective of the programme was to foster a culture of notification in the first year of operation. This study was aimed to find reasons for under-reporting and to suggest methods to improve the reporting culture.

MATERIALS AND METHODS: The survey was conducted among 100 doctors including dentists practicing in different hospitals, nursing homes and clinics in Bangalore using a Questionnaire.

RESULTS: Adverse drug reactions are commonly encountered in clinical practice. Dermatological and Gastrointestinal manifestations were very common and nausea/ vomiting is the commonest presentation. The common causative drugs were Antibiotics followed by NSAIDs. 84 respondents had seen ADRs and ... respondents had seen serious adverse drug reactions in the past year. Only one of the respondents had reported to the Pharmacovigilance centre.

Only 11 respondents were aware of the National pharmacovigilance programme and only 1 of the respondent knew where the nearest pharcovigilance center. The most important cause for not reporting was not being aware of the pharmacovigilance programme (89 respondents). All respondents thought that maintaining a database of ADRs were important and all (99 %) of them are willing to report if ADR forms are made available to them. Submitting a printed form was preferred by 62%, online submission is preferred by 22 % while 16% felt both were convenient.

CONCLUSION: Though all doctors felt maintaining a database of ADRs is important and are willing to report, there is lack of awareness about the national pharmacovigilance programme and where to report. This can be solved by awareness programmes for practicing doctors and undergraduate students as well as by providing easy access to ADR reporting forms.

ID-60

PHARMACOVIGILANCE- EXPERIENCE OF THE PERIPHERAL CENTRE, BANGALORE

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INTRODUCTION: Pharmacovigilance is the pharmacological science relating to the detection, assessment, understanding and prevention of adverse effects, particularly long term and short term side effect, of medicines. Adverse Drug Reaction (ADR) is any response to a drug that is noxious and unintended and that occurs at doses normally used in humans for prophylaxis, diagnosis or therapy of disease or for the modification of physiological function. Age, gender, race, co-morbid conditions, multiple drug therapy, drug dose and duration are the predisposing factors for developing an ADR. The objective of the present study is to contribute to the assessment of safety, risk and effectiveness of medicines as a part of the nationwide programme and to monitor the adverse events of drugs reported to the department and to assess the causality. We do make an attempt to create awareness among the healthcare professionals about pharmacovigilance issues and foster the culture of reporting suspected adverse events

METHODS: The data for the study was collected by first distributing the ADR forms in the major wards. The pharmacist then collects the reports during ward rounds. Outpatients were referred to department with completed forms for evaluation in case of a suspected ADR. The clinical pharmacist then collects the case and medication history by interviewing the

patients or the carer. The reported adverse events were then scrutinized and appropriate interventions and suggestions sent to the reporting physician. The causality assessment was carried out as per the Naranjo ADR Probability Scale and WHO Scale. 'Alert Cards' were prepared and issued to patients who showed definite and serious reactions to the drug, through the concerned doctor.

RESULTS: A total of 114 adverse events were reported to the department from Jan 2006-Sep 2006 from Victoria and Martha's Hospital. Out of the total 57.9% of ADRs were observed in the males among the age group of 21-30 yrs. The causative agent in majority of ADRs were due to antimicrobials (32.33%), followed by analgesics (25.56%) and CNS drugs (12.03%). The ADRs were reported mainly from the skin department as skin was the major organ system affected., Both Naranjo and WHO Scale rated most of the ADRs to be possible.

CONCLUSIONS: This ongoing programme was found to be beneficial to the physician and helps to gather more information on the incidence of such events in Bangalore.

ID-71

PRESCRIPTION AUDIT AND STUDY OF ADVERSE DRUG REACTIONS IN LUNG CANCER AT CURIE CENTRE

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INTRODUCTION: We have analyzed the prescription pattern of drugs in Lung Carcinoma and studied for common Adverse Drug Reaction.

MATERIAL AND METHODS: Lung Carcinoma patients consecutively admitted at the Curie Centre during September 2001-Aug 2006 were included in this retrospective observational case record study. Data collected on a specially designed Proforma was subjected to descriptive analysis.

RESULTS: Of the 68 patient treated, male female ratios were 2.5:1. Age range was 34-77years, mortality was 25%. Surgical resection followed by chemotherapy was the most common modality of treatment. Total prescription were 206, Anticancer drugs accounted for 26% with cisplatin and carboplatin 54%, gemcitabine 37%.Other drugs included in the prescription were Antiemetic 18% and Steroids 16%. A total of 80% of the treated patients experienced an ADR of Type A, and 60% developed more than one ADR, majority with Blood dyscarsias 65%, gastrointestinal system 18%and Dermatological manifestation of 7%.

CONCLUSIONS: Smokers show predominance for lung carcinoma. Adverse drug reaction is very common with drug induced blood dyscarsias being predominant type.

ID-79

A STUDY TO MONITOR ADVERSE DRUG REACTIONS OF THEOPHYLLINE IN PATIENTS OF OBSTRUCTIVE AIRWAY DISEASE

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INTRODUCTION: In recent years, the use of theophylline has emerged in the treatment of obstructive airway disease. This methylxanthine, the use of which was restricted due to its narrow therapeutic index and potential to induce toxicity, is now used as an useful adjuvant in the treatment of bronchial asthma and COPD. Though much lower concentrations are needed for the beneficial anti-inflammatory and immunomodulatory effects, the possibility of untoward effects are still a major concern and cannot be totally discounted. Hence the rationalization of Theophylline therapy is of great significance in contemporary therapy. The

present study evaluated the adverse effect profile associated with the oral usage of theophylline in patients of bronchial asthma and COPD.

After obtaining the necessary ethical clearance, outpatients of bronchial asthma and COPD were selected after following the exclusion/inclusion criteria and the ADR profile was recorded as per the proforma of the National Pharmacovigilance Programme (CDSCO). Causality assessment was done by using the Naranjo's scale.

Out of the total number of 120 patients enrolled for the study, 63 patients were prescribed theophylline (43 with COPD and 20 with bronchial asthma). 70% of the patients diagnosed as bronchial asthma (14 out of 20) and 46% with COPD (20 out of 43) complained of one or other adverse effect. The common ADRs with theophylline were: anxiety, tremor and palpitation (64%), dyspepsia (61%), spasm of muscles (38%), insomnia (32%), paresthesia (18%). Other adverse effects included theophylline withdrawal constipation, dizziness, etc. Analysis of the ADR data by Naranjo's scale revealed that most adverse effects fell in the 'probable' category, with anxiety and muscle spasms qualifying in the 'highly probable' category. These results show that theophylline use in obstructive airway disease can result in a variety of adverse effects and pharmacovigilance could be of great significance for devising strategies for preventing them and rationalizing the use of this drug in obstructive airway disease.

ID-4

STATIN REDUCES THE ABILITY OF CLOPIDOGREL TO INHIBIT PLATELET AGGREGATION: POSSIBLE NEW DRUG-DRUG INTERACTIONS.

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INTRODUCTION: Clopidogrel is an orally administered thienopyridine agent that selectively and irreversibly inhibits ADP induced platelet aggregation. The drug is inactive in vitro and requires in vivo oxidation by hepatic/ intestinal cytochrome P450 isoenzymes. Clopidogrel inhibits platelet aggregation. It decreases the incidence of coronary artery stent thrombosis and is approved for reduction of myocardial infarction, stroke, and vascular death in patients with atherosclerotic vascular disease. American College of Cardiology/American Heart also recommend co-administration of clopidogrel and statins in patients with acute coronary syndromes (ACS). The objective of the present study was to define which statin might interfere with the antiaggregation property of clopidogrel.

METHOD: Published Clinical trail articles, data collection and Statistical analysis

RESULTS: Several recent ex-vivo platelet function studies have suggested that clopidogrel's effectiveness in inhibiting platelet aggregation is diminished if given together with statins metabolised by cytochrome P450 3A4 (CYP3A4), whereas other studies have shown no interaction. CYP3A4 metabolises statins include lovastatin, simvastatin, cerivastatin, and atorvastatin. Non-CYP3A4 metabolised statins such as pravastatin, fluvastatin, and rosuvastatin should not interfere with clopidogrel's antiplatelet activity.

Certain statins which are substrates of the CYP3A4 isoform competitively inhibit the metabolic activation of clopidogrel. As a result the relative clopidogrel induced platelet inhibition (P-selectin-expression) is diminished — but still there is a relative clopidogrel effect of more than 80% in the maintenance phase. It may be reasonable to test the therapeutic efficacy of clopidogrel in those patients who require long-term treatment. However one study result that CYP3A4 statin plus clopidogrel was had no

significant difference in clinical benefit between a CYP3A4 statin and a non-CYP3A4 statin when used in conjunction with clopidogrel. This suggests that the proposed interaction is probably an ex-vivo phenomenon and may not be clinically relevant. Prodrug clopidogrel was less effective in inhibiting platelet aggregation with co-administration of atorvastatin during point-of-care platelet function testing. Because atorvastatin is metabolized by cytochrome P450 (CYP) 3A4, we hypothesized that clopidogrel might be activated by CYP3A4.

CONCLUSIONS: Use of a non-CYP3A4 statin and point-ofcare platelet function testing may be warranted in patients treated with clopidogrel with statin metabolized by CYP3A4.

ID-19

HERBAL PHARMACOVIGILANCE: TOWARDS SAFER USE OF HERBS

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ABSTRACT: Pharmacovigilance and regulation for herbal remedies is just as important as that for orthodox medicines, yet it appears not to be taken seriously in India. The problem in the lack of proper Pharmacovigilance profile of herbal product includes: lack of knowledge about the product being used, variable manufacturing standards (particularly of unlicensed products), error or deliberate intent; and drug interactions with herbal medicines. Four types of actions are involved in phytopharmacovigilance: Identification of risk, assessing the risk, monitoring the risk and managing the risk. Communicating effectively is a vital part of risk management. It is important that patients and consumers are prompted during a consultation to reveal if they are using herbal medicines because they often forget to volunteer the information. Pharmacists could also intervene during the over-the-counter purchases of herbal products in Pharmacy and offer advice when appropriate. There is an increasing awareness at several levels of the need to develop pharmacovigilance practices for herbal medicines. Awareness has arisen in part because of the extensive use of herbal medicines, and also because in recent years there have been several highprofile herbal safety concerns which have had an impact on the public health. Pharmacovigilance for herbal medicines is in the early stages of its development in India. An understanding of traditional approaches to safety with regard to medicinal plant use can serve in the implementation of programs combining scientific and traditional knowledge and practice to enhance the safety and efficacy of medicinal plant use.

ID-22

SAFETY PROFILE OF NEWER ANTIEPILEPTIC DRUGS

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INTRODUCTION: An epileptic patient forms a major part in neurology and they require treatment for longer period. Therefore we have studied the adverse effects of newer antiepileptic drugs on these patients.

METHOD: The study was carried out by department of pharmacology in collaboration with neurology unit of department of medicine of S.N. Medical College and associated hospitals, Agra. A total 490 patients were randomly selected from out patient and inpatient department of neurology during two years. The patients were randomly divided into four groups. Group I included 310 patients who were given Oxcarbazepine , Group II (88) patients Lamotrigine , Group III (62) patients who had taken Topiramate and Group IV (40) patients on Gabapentin respectively. These drugs were

given to the patients and their doses were gradually increased, depending upon the severity and control of seizures. It was observed that all adverse effects were dose dependent and group I (310 patients) Oxcarbazepine (group 1) showed somnolence in 30%, hyponatremia in 25%, rashes in 23% and headache in 15% whereas the patients on Lamotrigine (Group II, 88 patients) showed rashes in 17%, diplopia in 15% and headache in 13%. It was also observed that patients on Topiramate (Group III, 62 patients) showed somnolence in 21%, dizziness in 17% and anorexia in 12% whereas patients on Gabapentin (Group IV, 40 patients) had somnolence in 19%, fatigue in 18% and dizziness in 9%.

CONCLUSIONS: It can be concluded that somnolence and hyponatremia is the most common adverse effect found in the patients on newer antiepileptic drugs. The doses of the drugs may be increased until effective epileptic control is achieved but a balance between therapy (administered doses) and adverse effects should always be kept in mind.

ID-28

PRESCRIBING HABITS OF PHYSICIANS IN RURAL AND URBAN AREAS OF MAHARASHTRA

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INTRODUCTION: Now a days to meet global standards, pharmacist is expected to advice and also caution the patients concerning dosage regimen and possible adverse effects including contraindications. The examination of the extent to which conditions congenial to bring about the expected trends in pharmacy practice was studied.

METHODS: The prescription samples obtained from the pharmacists were evaluated to see the extent to which they comply with the standard norms laid down by textbooks and 'Good pharmacy practices'.

RESULTS: A survey and audit of 554 prescriptions revealed some alarming facts. Only 0.40% prescriptions complied with the Textbook format of prescriptions. Normally missing from the prescriptions is the information concerning Age, Sex, diagnosis and history of other pathophysiological symptoms. About 20% prescriptions are illegible even to practicing pharmacists. 34% prescriptions had to be categorized as irrational. About 10% prescriptions contained more than two antibiotics. Prescriptions containing, cough sedatives and NSAIDs more than one antispasmodics, laxatives, antidiarrhoeials, antimalarials were also in good number. Dose abnormalities were found in 27% prescriptions. Drugs being given for inadequate duration were also seen. More than one gastric irritant were also prescribed in many prescriptions. Combination of Antimalarial and Antibiotic together has become a normal practice. A few prescriptions contained three vitamin (same) preparations. Steroids are used irrationally Based on the study we suggest a cohort system has to be developed by Physicians and Pharmacists in order to prevent these irrational prescriptions. Most of the prescriptions lacked the information, which is vital from the point of view of pharmacists. The information, which was commonly, and conspicuously missing from the prescriptions was sex (84%), age (89%) and address (82%) of the patient, diagnosis (82%) made by the physician, pathological (such as blood pressure, diabetes etc.) and physiological (such as pregnancy) status of the patient. Out of the 15 points, which are essential in the prescriptions, only 4 points were complied with. In many cases incomplete names of the patients were mentioned so that identification of the patient become difficult. On several prescriptions the usual sign of Rx was missing.

Names, addresses and telephone numbers of physicians appeared on most of the prescriptions but qualifications and Registration numbers were missing from many. In a few cases abbreviated designations of retired medical officers followed the names of the practitioners so they may be taken as degrees. In a few cases some certificate or postal courses were used to indicate degree. 28% prescriptions did not even bear the signature of the physician.

About 10% prescriptions contained advertisement of a prescriber in some form or other. The prescription blank (pads) are provided by retail medical shops in some cases. In a few cases a common pad is used by husband and wife, one with allopathic degree and the other with some other pathy. Even a person without formal training in allopathy was found to claim on the prescription head to be a specialist in a field like gynecology etc.

There were a few prescriptions on which physicians name was missing while on several prescriptions physicians' registration number was not mentioned.

In contrast to above a good number of prescriptions giving detailed instructions to patients were also observed. Such prescriptions were mostly from specialists in modern medicine with postgraduate degrees.

ID-31

TOXICOLOGICAL EVALUATION OF SOME BLEACHING AGENTS ON ANIMAL SKIN

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INTRODUCTION: Bleaching treatment for skin and hair is very common and may alter the physiology of skin leading to irreparable damage to hair. The most common formulation referred to as bleaching paste consist of bleaching powder with hydrogen peroxide (20 vol.) and liquid ammonia. It is simple to prepare and apply. Although, the composition depends on the skin texture and sensitivity the common user finds it easy to formulate and use. In fact many times bleaching alters the physiology of skin and may cause irreparable damage to hair. However, in spite of these drawbacks, skin-bleaching creams have a considerable worldwide sale in the United States, Africa and Asia. These creams are purchased mostly over the counter without a doctor's prescription. To our knowledge no report is available describing histological effect of bleaching paste in experimental animals. The present study provides information about the histopathological changes and skin sensitivity to the bleaching agents like bleaching powder, hydrogen peroxide and ammonia using albino rats and New Zealand white rabbits.

METHODS: The study included the primary irritation testing & superficial and histological changes in skin. Thickness of epidermis, dermis, diameter of hair follicles and sebaceous glands were recorded by using occulometer (0.01mm). Histopathological study revealed prominent changes in epidermis, severe obliteration of connective tissue in dermal region, reduction in diameter of hair follicles and atrophy of sebaceous glands. Erythema and edema was observed after treatment with hydrogen peroxide and bleaching paste.

RESULTS: Staining with deep blue colour, erythema and a superficial dry slough at the test site, which contains cell debris and dead tissues were observed in some animals after treatment with ammonia.

CONCLUSIONS: Therefore, present study indicates that use of bleaching agents should be optimized in all cosmetic preparations for safety parameters

ID-35

CLINICAL STUDY: EFFECT OF PHYTOTHERAPEUTICAL ON SKIN REGENERATION AND BARRIER PROPERTIES OF HUMAN SKIN

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INTRODUCTION: The present study was carried out to assess the skin regeneration and barrier properties of topically applied phytotherapeutical on human volunteers. Based on traditional knowledge and experience, Berberis aristata (Daruharidra) mentioned in Indian System of Medicine was selected for the present clinical evaluation.

METHODS: Topical formulation of hydroalcoholic extract (1:1) was prepared in suitable o/w cream base and applied to volar forearm of 20 subjects (Age group 20-25 yrs and 40-45 yrs each). To assess skin regeneration activity, time required to decline the florescent intensity of Dansyl chloride (a fluorescent marker) treated with proposed formulation was measured till the fluorescence completely disappeared. Skin barrier properties were assessed by measuring biophysical parameters like moisture content, skin sebum and skin pH before and after 1, 3 and 4 hours of application by sebumeter-corneometer-pH meter combination unit (Courage+Khazaka, Koln, Germany).

RESULTS: Proposed topical formulation showed significant skin regeneration activity. In case of skin barrier properties, skin showed increase in moisture content when compared with base value; acidity and sebum content were in the desired range. It was further observed that addition of sodium pidolate in formulation enhanced the rate of skin regeneration.

CONCLUSIONS: It might be possible that significant antioxidant activity (carried out by in- vitro methods) of Daruharidra extract and its proposed formulation is playing a key role in skin regeneration properties of human skin. From feedback obtained from participating human volunteers, proposed topical formulation of Daruharidra didn't evoke any untoward effects (irritation, itching, redness of skin etc.), hence considered to be safe.

ID-36

PERIPHERAL EDEMA DUE TO CALCIUM CHANNEL BLOCKERS-EVALUATION OF ITS PATTERN FROM SPONTANEOUS REPORTS RECEIVED IN AN ADR REPORTING UNIT

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INTRODUCTION: Even though dose dependent peripheral edema is one among the most well recognized adverse drug reactions (ADRs) of calcium channel blockers (CCBs), it may be clinically significant in many instances. The objective of this study was to evaluate the pattern of reports on peripheral edema due to CCBs received in an ADR reporting unit.

METHODS: Reports on peripheral edema with CCBs received in the ADR reporting unit of KH (a 1,400 bedded tertiary care teaching hospital), Manipal was selected for evaluation. Evaluation was done for patient characteristics, drug characteristics, reaction characteristics, management and outcome. Assessment for severity and causality was also done.

RESULTS: Twenty six reports of peripheral edema due to CCBs included for evaluation accounted for 55.3% of ADR reports to CCBs. Peripheral edema due to CCB was the reason for hospital admission in (34.6%) of reports. Greater number of reports were in females (76.9%) and in the age group of elderly adults (61-75); (42.3%). Majority of the reports were for amlodipine (69.2%), followed by nifedipine

(23%) and diltiazem (7.7%). Onset of the manifestation after administration of the drug, as noticed, ranged from 3 days to 3 years. Drug was withdrawn after the development of the reaction in majority (65.4%) of reports. Among the cases where in the drug was withdrawn or dose was reduced, definite improvement was noticed in 41% of reports, while the final outcome was not known in 52.9% of reports. Sixty five percent of the cases was clinically relevant. Upon causality assessment, majority of the reports were probable (53.8%). Majority of the reactions were mild (53.8%) in severity followed by moderate (46.1%).

Conclusions: Even though a well known and common ADR, CCB induced peripheral edema is clinically significant and causes patient discomfort in many instances.

ID-38

NEED AND DESIGN OF COMPUTERIZED ADR PREVENTION SYSTEM

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INTRODUCTION: Disastrous episodes caused by sulphanilamide syrup in 1935, thalidomide in 1961 and digitoxin in 1970 prompted the emergence of Pharmacovigilance and Toxicovigilance to monitor safety and efficacy of medicines. In the state apex hospitals that maintain nearly 200 odd drug inventories for in patient use, it is not possible for the pharmacist to remember all possible ADR'S or DRUG INTERACTIONS for efficient prescription validation.

METHODS: To prevent drug interactions, a computerised prescription order entry and alert system may be implemented at the nodal points in a hospital to avert the ADRs or drug interactions. The main stages at which there is a major possibility of adverse drug reactions or drug interaction occurrence are prescription, transcription, dispensing and administration.

RESULTS: The system proposed mainly targets the elimination of errors at all the four stages from drug ordering to delivery. The system is very efficient in that it can decrease the errors at ordering or prescription stage to an extent of about 56% and at transcription stage to an impressive 86%. This can be achieved by the better coordination between pharmacist, physician, nurses and the patient database mainly through greater connectivity of health centers, hospitals, etc with local/nearest pharmacovigilance and toxicovigilance center, preferably through web, and ultimately networking to national data base which will ensure integration of ADR reports and drug interaction incidents to the world database maintained and updated by UPPASALA CENTER. Most importantly pharmacists must be trained and oriented to identify important drug interactions and should subsequently be encouraged by hospital authorities to apply their knowledge in prescription validation.

CONCLUSIONS : In India, this is particularly required to establish a meaningful clinical role of pharmacist as an important member of the health team, and not merely dispenser of drugs. The starting database should consist minimally of the WHO recommended essential dugs, their ADR's, known and potential interactions (drug-drug, drug food, drug-herb interactions). More funds should be made available to build up of a nation wide database of drug interactions, which should be made freely available to ensure the lofty goal of "**HEALTH FOR ALL**"

ID-40

PRESCRIBING PATTEREN FOR RESISTANT MALARIA IN SIRSA DISTRICT OF HARYANA

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INTRODUCTION: Antimalarial drug resistance is a major health problem in the path of controlling the malaria.

METHODS: The statistical analysis of survey for prescribing pattern for the treatment of resistant malaria in Sirsa district of Haryana State was done. Resistant malaria can be seen in any age group i.e. in a new- born or in a very old person with almost equal frequency.

RESULTS: This disease affects equally both the sexes but found more in rural areas or unhygienic conditions and in no way is related to literacy. The common drugs or first line treatment drugs prescribed in malaria are Quinine sulfate; Pyrimethamine plus Sulfonamide; Mefloquinine. Second to these is Artesunate, which is used when malaria is resistant to first line drugs. Prescription also involves combination of Artemether and Lumofantrine, which is also second line drug. High fluid intake is prescribed during the treatment. The duration of therapy lasts for 3 to 14 days depending on the type of drugs used for treatment.

ID-41

A CLINICAL STUDY ON FOLLOW UP OF HEPATITIS B PATIENTS FOR THEIR CARRIER STATE

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INTRODUCTION: The present study is mainly focused to evaluate the incidence of chronic active hepatitis or chronic carriers from acute hepatitis who were treated with the combination of antiviral drugs.

METHODS: The incidence of chronic active hepatitis or chronic carrier state of hepatitis B infection is about 10% and the other 90% cases recover spontaneously. The above 10% of patients may go in for cirrhosis of liver and carcinoma of liver. When proper anti-viral therapy is given for all acute viral hepatitis B patients, we will be able to prevent them going in for the above said dreaded complications. If we find any patient suffered from chronic hepatitis or carrier state during the follow up study, the treatment should be modified to 100% cure.

For our follow up study we selected hepatitis B positive patients who had suffered 2 to 12 years back. Those patient's MEDICATION CASE SHEETS had been perused and they were contacted through letter and by personal visit to their home and official addresses. Those patients who were all came for review, their blood samples had been collected for laboratory investigations like HBsAg, Anti-HBs, Anti-HCV and Total serum protein, Albumin and Globulin.

RESULTS: Patients who got normal report are asked to take regular checkup for every one year and patients those were positive for HBsAg are asked to undergo the sophisticated test named HBV DNA polymerase chain reaction (PCR).If HBV DNA showed positive patients must undergo treatment, if negative patients advised for regular check up on every one year to assess how long they are going to harbour the HBsAg.

Conclusions: From our study it was observed that 2 patients who showed surface antigen positive in their sera and found to be negative in HBV DNA by PCR assay. so these patients may be called as FALSE CARRIERS and they will not transmit the disease to their family members and others as well.

ID-42

CLINICAL STUDY ON THE ADVERSE DRUG REACTION OF SOLIFENACIN

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INTRODUCTION: Objective of the study was to evaluate the adverse drug reaction of SOLIFENACIN in urinary incontinence patients.

METHODS: Solifenacin was evaluated for safety in patients with urinary incontinence. Expected side effects of anti-muscarinic agents are dry mouth, constipation, blurred vision, urinary retention and dry eyes. Out of 65 patients34 patients were under treatment with 5mg of solifenacin and 31 patients were under treatment with 10mg once daily of solifenacin.

RESULTS: The adverse drug reaction was observed from the 65 patients for 12 weeks. From the 12th week of observations the solifenacin 5mg once daily treated patients ,25% of the patients complained gastrointestinal disorders like dry mouth, constipation, nausea, dyspepsia and abdominal pain. It was doubled in the patient taking 10mg once daily.2% of patient's in both doses complained central nervous system disorder like dizziness,3.8% in 5mg dose level and 4.8% in 10mg dose level reported that vision is blurred. Dry eyes, urinary retention was observed only in 10mg.The most common adverse event reported in patients treated with solifenacin was dry mouth, constipation and blurred vision. The incidence of these side effects, were highest in the 10mg when compared to the 5mg dose of solifenacin.

ID-44

ROLE OF VITAMIN C IN REDUCTION OF BLOOD PRESSURE AND C REACTIVE PROTEIN LEVELS

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INTRODUCTION: Vitamin C, an effective anti-oxidant reduces nitric oxide destruction, which commonly occurs in oxidative stress situations in hypertensive patients. Hence vitamin C supplementation along with standard anti-hypertensive therapy significantly reduces blood pressure by preventing nitric oxide destruction.

METHODS: In present study, vitamin C along with standard enalapril 5 mg BD is given to patients with mild to moderate hypertension of both sexes and blood pressure and C reactive protein levels are evaluated at the end of 1st, 3rd and 6th months of study. Vitamin C given at dose of 500mg/day along with enalapril 5 mg significantly reduces blood pressure when compared with enalapril 5 mg group.

RESULTS: Vitamin C also reduces C reactive protein levels to significant level when given at the dose of 500mg/ day. These significant differences are seen within the period of 3 months. Vitamin C is well tolerated at this dose with significant reduction of blood pressure and C reactive protein levels at the end of 3 months and 6 months.

CONCLUSIONS: Hence Vitamin C can be added as a supplementation to standard anti-hypertensive therapy since it prevents future cardiovascular risks associated with increased blood pressure and C reactive protein levels.

ID-46

RETROSPECTIVE EVALUATION OF THE HEPATIC ADVERSE DRUG REACTIONS REPORTED IN A TERTIARY CARE HOSPITAL.

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INTRODUCTION: The manifestations of drug-induced hepatotoxicity are highly variable, ranging from asymptomatic elevation of liver enzymes to fulminant hepatic failure. It is important to evaluate the pattern of hepatic adverse drug reactions occurring in a hospital set up. The objective of the present study was to evaluate the pattern of hepatic adverse drug

reactions reported in the ADR reporting unit of a tertiary care teaching hospital.

METHODS: Reports on hepatic adverse drug reactions received in the ADR reporting unit of Kasturba Hospital, Manipal over a period of 4 ½ years was selected for evaluation. Reports were evaluated for patient characteristics, drug characteristics, reaction characteristics, management, outcome and severity. Total of 44 ADRs affecting the hepatic system was selected which constituted 2.9% of the total ADRs reported in the ADR reporting unit.

RESULTS: More number of reports were in males (65.9%) and in the age group of 16-30 (29.5%). Drug class most commonly involved in the reaction was antitubercular drugs (59%) followed by antibacterials (13.6%). Non antitubercular drug with highest number of reports was cotrimoxazole (6.8%). In 59.1% of reports there was symptomatic hepatitis with elevation of liver function tests. In many (38.63%) of the reports the hepatic manifestations occurred within 1week to 2week of the initiation of the therapy. The suspected drugs (s) were withdrawn in 88.6% of reports. In 65.9% of reports there was complete recovery from the reaction. Majority (88.6%) of the reactions were of moderate severity. On assessment it was found that in 34.09% of reports, ADR was the reason for hospital admission. Event though hepatic adverse drug reactions accounted only for a small percentage of the total ADR reports in the hospital, majority of them were of moderate severity. Monitoring for the effects of drugs with hepatotoxic potential is of utmost importance. hospital, majority of them were of moderate severity. Antitubercular drugs accounted for majority of the reports. Monitoring for the effects of drugs with hepatotoxic potential is of utmost importance.

CONCLUSIONS: Educating the patients regarding early detection of hepatotoxic manifestations is equally important. Study has provided with useful information regarding the pattern of hepatic adverse drug reactions in our hospital set up.

ID-50

ARTIFICIAL NEURON NETWORK AS A TOOL IN DRUG DISCOVERY

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INTRODUCTION: This article comprises a tutorial view,introducing the fundamental ideas of rapidly growing field of Artifical Neural Network(ANN) and its application in drug discovery. Here, we have focussed on the introductory part of ANN and its complexities, which have been deliberately avoided and emphasis is laid to the operational details of what goes into neural network and what comes out of it. And also some details about neural network architecture, neural network design and learning process. Artifical neurons are similar to human neurons and are more accurately called as

Artifical Neuron Network (ANN).They are computational models that consists of simple processing units that communicates by sending signals to each other over a large no of weight connections.Neural networks are part of a new era of evolving computer technology in which a computer system has been designed to learn from data in a manner emulating the learning pattern in the brain. They are typically used when there are a large number of observations and when the problem is not understood well enough to write a procedural program or expert system.

The use of ANN in chemistry has further expanded into the analysis of spectral data, harmaceutical development, classification of anti-cancer compounds, prediction of chemical reactivity, physical properties, electrostatic

potential, ionization potentials as well as QSARs. It has wide range of applications in QSAR studies, which rely heavily upon statistics to derive mathematical models, which relates the biological activity of a series of compounds to one or more properties of molecules. These properties or descriptors, may be derived from numerous sources including refractive index, octanol/water partition coefficient or spectral data.

ID-53

PREDICTION OF SELECTED BIOPHARMACEUTICAL PROPERTIES AND SPECTRA OF SOME HYPOTHETICAL EPALONS

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INTRODUCTION: Epalons are defined as a unique class of synthetic and naturally occurring pregnane steroids with high specificity for a novel allosteric modulatory site on the GABAA receptor complex (GRC). Their ability to allosterically potentiate GABA action at the GABAA receptor with high potency and specificity provides the basis and rationale for their potential use as CNS therapeutic agents. Animal and human studies suggest that epalons plays an important role in several disorders including premenstrual syndrome, anxiety, memory impairment, etc. The clinical attraction of steroid anaesthetics includes the advantages of good overall safety, lack of toxicity and a relatively rapid metabolism by the liver that promotes a short duration of action. Their use in clinic has, however, been hampered by problems in formulation stemming from their solubility in water. A well know example was alphaxalone which enjoyed a widespread clinical use as a principle anaesthetic component of the formulation "Althesin" in 1970's, but anaphaloctoid reactions associated with the vehicle Cremonphor EL led to the compound's demise as an anaesthetic in man.

METHODS: In an effort to develop a water-soluble steroidal intravenous anaesthetic retaining the advantages of alphaxalone, a series of hypothetical molecules were generated based on the structure of alphaxalone and their biopharmaceutical properties, QSAR parameters and spectra were predicted using ACD/I Labs software v 6.0. The aqueous solubility of hypothetical molecules was predicted by empirical and analytical approaches, ASER and in-silico QSPR methodologies.

RESULTS: Among all hypothetical molecules few were predicted to be water soluble and orally active.

ID-56

CRITICAL ANALYSIS OF SOME PRESCRIPTIONS BY PHYSICIANS OF OTHER THAN ALLOPATHIC SYSTEM OF MEDICINE.

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INTRODUCTION:

METHODS: A study was carried out in which prescription containing the drugs belonging to allopathic system are prescribed by the physician who has no qualification in allopathic system of medicine were analyzed. Several prescriptions were critically examined for their compliance with respect to standard format of a prescription.

RESULTS: The analysis showed interesting results like absences of most important parameter like age, sex, weight in the prescription. In some cases improper date (absence of year) was observed. The history of the patient and diagnosis was missing from all the prescriptions. In many cases improper dose and improper dosage

regimen was prescribed. There was lack of direction for use to the patient in most of cases. Some prescriptions have multiple drugs with same therapeutic action prescribed together. Above all signature & renewal instructions have been missing in few cases. It was also observed that antibiotics and antimalarials were prescribed together and most importantly the spelling mistakes were abundant.

CONCLUSIONS: From these observations it is clearly noted that the physicians do not restrict their prescriptions in the system in which they are trained. Under these circumstances it would be difficult for pharmacist to perform his duties as required in present days. Joint consultation of the various health disciplines may help in arriving at the solution.

ID-57

INVESTIGATION OF MEDICINE USE BEHAVIOUR OF THE URBAN POPULATION OF HISAR

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INTRODUCTION: The present study was conducted to evaluate the medication use behaviour of the urban population of Hisar with regard to self-medication sources of information for drug use and their medication storage practices. The data was collected retrospectively.

METHODS: A total of 50 individuals aged between 18-65 years selected randomly were interviewed using a carefully designed and validated questionnaire. The observations were recorded in a schematic manner and data were analysed.

RESULTS: The analysis of the data revealed that only 26% of the individuals preferred to consult physicians for their first line of treatment. It was observed that 26% of the individuals obtain the information for self medication from community pharmacist, 30% from family and friends, 19% of the people treat themselves using older prescriptions. Further it was observed the frequency of drugs for self-medication ranked in the order-Analgesics and Antipyretics > cold/cough remedies > Antidiarrhoeals > Antacids > Antiallergics > Multivitamins >Antibiotics. It was observed that about 84% of the urban population checks expiry date before administration. Study revealed that 60% population read the label. It was observed that 74% of the population store medicines away from a child reach. The study also revealed that 46% of population use eye drops over one month after opening. It was observed that 24% of the people medicated themselves with antibiotics and only 6% of them knew the proper usage of antibiotics. One of the most dangerous result came out that 47% of people use Non-OTC drugs without prescription. Improper usage and storage of drugs, overuse of drugs and self-medication are the various problems in the medicine use, widespread in society. The main reasons for self-medications include –High consultation fees of doctors, unavailability of a doctor in nearby locality, ready availability of drugs at medical stores etc. Steps should be taken to educate people about the proper usage and storage of medicines at home. Also the danger of self-medication with prescription drugs should be explained to them.

ID-59

NICOTINIC ACID: AN INSTITUTIONAL EXPERIENCE WITH DRUG USAGE AND SAFETY

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INTRODUCTION: Xanthinol nicotinate, a nicotinic acid derivative is used in the management of peripheral vascular disorders

for 40 years. Although the drug is obsolete in western countries it is still prescribed in South East Asian region including India. Wide range of adverse effects is associated nicotinic acid and its derivatives. It is not clear to what extent the incidence of adverse reactions is same as that encountered with its derivatives.

METHODS: A case of bullous eruptions due to xanthinol nicotinate and institutional experience with drug usage are studied along with literature review. A PUBMED, MEDSCAPE search from 1965 to July 2006 (Key search terms, xanthinol nicotinate and bullous eruptions) did not reveal any case associated with the said reaction. Prospective study for duration of two years was done to evaluate the rational behind the prescription of the said drug in our set-up.

RESULTS: Analysis of causality of adverse drug reaction (ADR) revealed a probable reaction with a severity level M3. Timely intervention by team of Surgeons, Dermatologist and Clinical Pharmacist helped in effective management of this rare ADR. Xanthinol nicotinate is among the mainstay of therapy in our institute for peripheral vascular disease, venous pressure and hypercoagulation states in case where surgery is not a feasible option.

CONCLUSIONS: Nevertheless, it is important to assess the drug under routine treatment conditions in order to learn which adverse drug reactions can be expected and how often, and whether the efficacy claimed by phase III studies can still be seen under routine treatment conditions.

ID-61

PHARMACOVIGILANCE – DENTAL PERSPECTIVE

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INTRODUCTION: Rapid progress in dental pharmacotherapeutics requires that dentists constantly update their knowledge of new drugs, drug safety and therapeutic trends. Recent example of bisphosphonate (which is the mainstay of therapy for osteoporosis in India and South East Asian countries) associated poor healing, spontaneous intraoral ulceration and bone necrosis in the oral and maxillofacial region stresses the need for vigilance in spontaneous reporting of adverse events by dental practitioners

METHODS: A retrospective literature evaluation was done with key words, 'drugs in dental set-up', 'drug safety in dentistry' and 'adverse drug reactions" to evaluate the current status of drug safety and awareness about adverse drug reaction monitoring and reporting among the dental professionals from PUBMED, MEDSCAPE, MEDLINE and Cochrane databases during April 1995 till April 2006.

RESULTS: Polypharmacy, adverse drug reactions and interactions were common in the dental arena. Increasing numbers of dental patients were taking medications like bisphosphonates having potential to cause serious adverse drug reactions. There was a need to identify specific adverse drug reactions that were relevant to the therapeutic agents commonly used in general and specific dental practice. Spontaneous reporting culture can help in prevention and management of adverse events associated with drug usage in dental set-up.

CONCLUSIONS: Fostering reporting culture as a part of constant vigil among the dental professionals along with clinical pharmacists and other healthcare team to early identify new problems of a drug therapy, to take measures to minimize the risk is the need of the hour.

ID-62

SCREENING OF PULMONARY TUBERCULOSIS IN TERTIARY CARE TEACHING HOSPITAL

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INTRODUCTION: Tuberculosis is a growing menace worldwide and particularly in industrialized countries. It is said to have infected about 1/3rd of the world population. Tuberculosis infects about 8 million people and clashes two million lives annually. The control of this disease is made more challenging due to the overcrowding leading to massive infection or re-infection and relies chiefly on adequate screening so that effective treatment can be instituted to control the spread of the disease. I am here by presenting my paper on a retrospective study illustrating the sociodemographic details of patients who where tuberculosis positive and who presented for tuberculosis screening in KIM'S a tertiary care teaching hospital. The study was carried out for a period of over 10 months from July 2005 to April 2006 based on the laboratory records stored in the hospital. Overall 833 patients were screened and 103(12.36%) were found to be smear positive. 78(75.72%) accounts for male and 25(24.27%) for female percentages respectively. The male to female ratio was found to be 3:1. The smear positive patient's age ranges from 10-70 years and with an average age group of 30-49(36.89%). The overall smear examined was 265 slides of which 1+ grade was 156(58.86%), 2+ grade was 51(19.24%) and 3+grade was found to be 58(21.88%). The study helps to identify smear positive tubercular patients so that they can be given proper counseling and treatment to their quality of their life and to prevent the spread of the infectious agents.

ID-64

QUALITY EVALUATION OF SOME MARKETED DELAYED RELEASE ASPIRIN TABLETS

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INTRODUCTION: The experiment was designed for the quality evaluation of the delayed release Aspirin tablets.

METHODS: For this experiment market survey was performed and the products were purchased from the market. The expiry dates of the formulations were checked and the formulations which were within this period were used for the experiment purpose. The formulations used were in tablet forms. The different brands of delayed release Aspirin tablets were evaluated for Hardness, Disintegration test, Percentage content and Dissolution test.

RESULTS: Out of six tablets five tablets shows the hardness ranging from 3 to 5 cm/kg2. disintegration test ranges from 5 to 8 min. But one tablet among the six tablets shows very very low hardness and it disintegrated within one min in 0.1N HCl acidic media, which failed the disintegration test. The Percentage content & dissolution test shows the results within USP limits. There are multiple brands of same drugs and very few patients know which brand they received previously.

ID-65

SOCIODEMOGRAPHIC STUDY OF CHIKUNGUNYA

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INTRODUCTION: Chikungunya is a rare form of viral fever caused by an alpha virus that is spread by mosquito bite from the Aedes aegypti mosquito. Disease is characterized by fever with chills and arthritic symptoms. The disease was first described by Marion Robinson and W.H.R. Lumsden in 1952. Chikungunya is not considered to be fatal, however, in 2005-2006, deaths have been reported associated with Chikungunya in South India.

METHODS: To carry out sociodemographic study of the patients suffering from chikungunya a retrospective study of cases was collected from KIMS Hospital and Research Center, Bangalore, Karnataka; and from Government Hospital, Sompura, Bangalore District, and Karnataka, data was collected from medical records; case book study; and from interacting with the physicians, pharmacists, and other health care professionals.A total of 381 patients' case sheets were studied.

RESULTS: Among them, the age group of 1-12 years, 12-30 years, 30-50 years, and above 50 years constitutes for 10%, 30%, 35%, and 25% respectively. We observed from the data that there were no cases of infants diagnosed or admitted with the complaint of chikungunya in the study population.

CONCLUSIONS: The study revealed that the patients in the age group of 40 years and above have shown a very slow recovery period with respect to the arthritic symptoms. We found that most of the patients were from the areas of poor sanitation and exposed sewage systems and there were more number of patients in the age group of 30-50 years.

ID-66

ADVERSE DRUG REACTION MONITORING OF HERBAL MEDICINES

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INTRODUCTION: WHO's Definition for ADR: "a response to a medicine which is noxious and unintended, and which occurs at doses normally used in man for the prophylaxis, diagnosis or therapy of disease, or for the modification of physiological function". In Herbal medicines there are now total of 153 reports encompassing 172 products. These reports cover a range of products, such as echinacea and bee pollen. Hence from July 2002, the term 'herbal medicines' has been widened to 'complementary and alternative medicines' (CAMs), to include any medicines containing plant or animal extracts. The patients and health care professional should also be aware of ADR and interaction between herbal and other prescribed or OTC, medication and also cause unexpected reaction. Many countries need expertise and guidance to develop national regulations and ADR monitoring of herbal medicines. Among consumers, there is a wide spread misconception that natural always means safe and a common believe that remedies from natural origins are harmless and carry no risk. Further, as with all medicines, herbal medicines are expected to have side effects which may be in adverse nature. The present legislation require pharmaceutical companies to demonstrates the quality, safety and efficacy of their products to the relevant competent authority for license medicines. After assessment, the licensing authority may or may not grant a marketing authorization (MA:product license).

The license product (including licensed herbal medicines products) should comply with regulation provision of pharmacovigilance.

ID-67

ADVERSE REACTIONS OF BREAST CANCER CHEMOTHERAPY AND THEIR PREVENTIVE MEASURES IN A CANCER HOSPITAL

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INTRODUCTION: Adverse drug reactions (ADRs) to breast cancer therapy are a limiting factor in the treatment of breast cancer. A prospective study was carried out to assess the ADR'S of breast cancer chemotherapy and preventive measures adopted in a cancer hospital.

METHODS: All breast cancer patients receiving chemotherapy by medical oncology department were included. The data was collected during ward rounds from patient medical records by chart reviews. ADRs were assessed appropriately

for all the four types of chemotherapeutic regimens provided. The total ADRs with "Regimen I" were 26 which included 20(77%) neutropenia, 1(3.8%) vomiting, 1(3.8%) anemia, 2(7.6%) constipation, 1(3.8%) cough and 1(3.8%) pruritis. Total ADRs with "Regimen II" were 7 of which 5(71%) neutropenia and 2(29%) mucositis while ADRs of "Regimen III" were19 of which 9 (47%) neutropenia, 1(5%) febrile neutropenia, 2(10.5%) anemia, 6(31.5%) mucositis and 1(5%) diarrhea "Regimen IV" had 2 ADRs of which 1(50%) hand-foot syndrome, 1(50%) hyperpigmentation.

RESULTS: During the treatment with regimens I, II and III the major ADR observed was neutropenia. All ADRs observed during each regimen, were assessed for causality, severity, edictability and preventability. Majority of the ADRs were Type-A and mild, and classified as probable according to Narinjo's scale and possible with WHO scale and were predictable, but not preventable. Incidence of nausea and vomiting were relatively lower because of the prophylactic medications like 5-HT3 antagonists, prokinetic agents, Lorazepam and dexamethasone which played an important role in preventing ADRs. ADRs of breast cancer chemotherapy are not preventable but the severity of which can be minimized by prophylactic measures.

ID-68

PHARMACOVIGILANCE STUDY IN THE DERMATOLOGY DEPARTMENT OF A TERTIARY CARE HOSPITAL IN SOUTH INDIA

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INTRODUCTION: Pharmacovigilance is an established activity in the developed countries. Pharmacovigilance is a rapidly growing field..

METHODS: This study was carried out from April 2004 to March 2005. ADR Monitoring system was implemented in a Dermatology department of a tertiary care hospital.. ADR Notification forms were provided to all dermatologists. Whenever they come across an adverse drug reaction, they will notify the clinical pharmacist involved in the study. The clinical pharmacist will then interview the patient and get the history of the patient and document all the details in the ADR documentation form. Then the collected forms were subjected to causality assessment using Naranjos Algorithm.

RESULTS: During the study period totally 80 ADRs were reported from the study department. Out of 80 cases 37 were female and 43 were males. Adverse drug reaction related visit was more common cause for the visit in these cases (67 cases). Antibiotics, Anti-convulsants and steroids were the most common classes of drugs accounting for the most number of cases (41 cases). When treatment pattern of adverse reactions were analyzed, stopping the suspected drug was the most important intervention (65 cases). When adverse reactions are subjected to Causality assessment by Naranjos Algorithm, most of the cases were probable (62 cases), followed by Possible (18 cases). None of the cases were assessed as Definite or Unlikely.

CONCLUSIONS: In this study ADRS and their patterns and commonly involved drugs in a Dermatology department were studied and there was a good response to the ADR monitoring system in the studied hospital.

ID-70

INDIA LEADS AMONG SOUTH EAST ASIAN COUNTRIES IN CLINICAL RESEARCH ACTIVITY

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INTRODUCTION: It is now well known that India has emerged as a favorable destination for conducting global clinical trials due to a variety of conditions.

METHODS: The most comprehensive clinical trial registry - Clinicaltrial.gov – was used to assess the evidence for ranking of India amongst South East Asian countries in contributing to clinical research in terms of ongoing numbers of clinical trials.

RESULTS: The WHO covers 11 countries in the South East Asian region namely, Bangladesh, Bhutan, DPR Korea, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand and Timor-Leste. A total of 289 clinical trials are ongoing in this region; and, India – as the most important player - contributes approximately 58% (167) to this. At the second rank is Thailand (28%) followed by Indonesia (6%) in the third place. The remaining 18% contribution comes from Bangladesh, Nepal, Sri Lanka, and other countries in the region. Therefore, this analysis demonstrates the dominant position of India as a major clinical research hub.

The Asian region also contributes significantly to clinical research with Taiwan (432 clinical trials), Japan (256), South Korea (156), China (156) and Hong Kong (85). It can be seen that India leads over Korea, China and Hong Kong. However, the contribution from India to global clinical trials is less than 1%.

CONCLUSIONS: This provides an opportunity to all healthcare professionals, including the pharmacists, for significant participation in clinical trials. Finally, this strong human resource pool will also require sensitization in relevant areas to enhance India's participation in high quality clinical research.

ID-73

HERB-DRUG INTERACTIONS REVISITED

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INTRODUCTION: There is an increasing trend among patients worldwide to resort to herbal medicines, particularly for chronic diseases. The annual global trade in herbal drug is approximately US$ 800 million per year. This is mainly due to low cost, easy availability, wide accessibility of the herbal therapies and popular belief that they are "natural" and hence safe. However, herbal drugs are often potent and contain numerous chemicals, which like any modern medicine have their own side effects. The situation is more complicated and alarming when one considers the scenario wherein the patient is taking modern synthetic medicines concurrently. Often these concurrent therapies go unreported and might lead to significant mortality and morbidity, whose cause remains unexplored. Even the health professionals are not totally aware of the possible implications of concurrent herbal and modern therapy. This is partly owing to the absence of any legal control on the popular herbal remedies and often due to the fact that the constituents of the herbal medicines are not fully known or standardized. There is either scanty or no quality control of herbal drugs worldwide with no importance being attached to their impurity and adulteration profiling.

A drug interaction is defined as any modification caused by another exogenous chemical (drug, herb, or food) in the diagnostic, therapeutic, or other action of a drug in or on the body. Consequently, not only the phytoconstituents present in the herbs, but also their impurities cause significant pharmacokinetic, pharmacodynamic and toxicological sequel in the human body. Several popular herbs such as ginseng, ginkgo biloba, kava, St. John's wort, Milk thistle, glucosamine, prune juice, ephedra, flex seed, and even ginger have been found to significantly interact with a plethora of modern medicines with alarming clinical consequences. Hence the common man as well as the physicians, nurses and pharmacists should become aware of these implications of concurrent modern and herbal (alternative) therapies and should take appropriate measures to curb potential disasters to health and life. Such knowledge is essential for effective

pharmacovigilance and toxicovigilance of herbal medicines.

In this presentation we, therefore, attempt to throw some light on the variety of herb-drug interactions that have been identified and need publicity among the health professionals for the betterment and rationalization of concurrent therapies.

ID-74

ADVERSE DRUG REACTIONS IN THE ICU OF A SOUTH INDIAN HOSPITAL (PSG HOSPITALS)

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INTRODUCTION: Adverse drug reactions (ADRs) continue to be of concern to all health professionals.ADRs contribute significantly to patient morbidity and mortality as well as to costs for health care systems. The aim was to study the pattern of occurence of adverse drug reactions in ICU.

METHODS: The study belongs to a prospective study conducted over a period of 9 months (from Nov 2005 to July 2006) involving 916 patients in the ICU,PSG Hospitals,CBE.The WHO definition of ADR was used.Only spontaneous ADR reported were noted. A total of 38 suspected ADRs were reported and evaluated .

RESULTS:A total of 4% of the ICU patients experienced some form of an ADR.Death was reported in 2 patients (5% of pts with ADR).Life-threatening ADRs were reported in 21.1% of pts. Skin was most commonly involved with ADRs (34.21%).The class most commonly implicated with ADR was antibiotics (60.51%). The prevalence of ADRs in the ICU of PSG hospitals was 4%.Even serious ADRs are under reported in hospitals .

CONCLUSIONS: Higher number of ADRs can be detected by intensified surveillance.

ID-75

A STUDY ON DRUG – DRUG INTERACTION BETWEEN ESOMEPRAZOLE AND SULFONYLUREA

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INTRODUCTION: Drug interaction between Proton pump inhibitors and sulfonylurea was studied. The study was conducted in healthy albino rats, rabbits and alloxan induced diabetic rats to evaluate the influence of repeated administration of esomeprazole on the hypoglycaemic effect of antidiabetic agents.

METHODS: Six groups of animals were selected. Group I, II & III was administered with tolbutamide (40 mg/kg) and groups IV, V & VI were administered with glibenclamide (40 μg/kg). The groups were treated with esomeprazole for 7days. On 8th day, one hour after esomeprazole treatment, group I, II III and IV, V & VI were administered with tolbutamide (40 mg/kg) and glibenclamide (40 μg/kg) respectively. Blood samples were drawn at different intervals of time on both the occasions i.e., before and after esomeprazole treatment and were analyzed for blood glucose levels by GOD/POD method. The same experiment was repeated only with (30 mg/kg esomeprazole) on rabbits and diabetic rats.

RESULTS: Esomeprazole (1.8 mg/kg and 3.6 mg/kg) doses have not influenced the hypoglycemia induced by sulfonylurea in the groups of healthy rats. However, esomeprazole (30 mg/kg) has enhanced the peak effect and duration of hypoglycemia induced by sulfonylurea. Similar results were obtained in diabetic rats also.

CONCLUSIONS: From the study, it was indicated that the isoenzymes of CYP-450 systems that are responsible for the metabolism of sulfonylurea are less sensitive to esomeprazole and hence higher doses are required to inhibit

them and ereby affect the hypoglycemia induced by sulfonylurea. Therefore it seems, there is a need to go for TDM so as to readjust the doses of concomitantly used esomeprazole and sulfonylurea.

ID-76

STUDY OF PERCEPTION OF PHYSICIANS ON PHARMACO-VIGILANCE PROGRAM IN A TERTIARY CARE HOSPITAL IN SOUTH INDIA

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INTRODUCTION: Pharmacovigilance activity in our country is gathering momentum. Physicians are an integral part of the spontaneous reporting system. This study was conducted in a tertiary care hospital in Coimbatore in the year 2005. National pharmacovigilance system was started by the end of 2004 in the study hospital. The study hospital is a peripheral reporting centre. This study was planned to study the perception on Pharmacovigilance activities.

METHODS: A questionnaire was designed to study the issues like physician's perception on Adverse drug reaction, factors preventing the investigation of ADR, methods for confirmation of ADR, important ADRs physicians feel important to report. Totally 22 doctors were interviewed to study their perception. The physicians were from the departments of Dermatology, OBG, Medicine, Cardiology, Pediatrics, Community medicine, Nephrology and Gastroenterology. Majority of the clinicians opined that trivial ADRs, Lack of time, non availability of ADR forms were the reasons for not reporting ADRs.

RESULTS: Majority of the doctors confirmed ADRs with the help of Published Literature and Previous experience. On a Question on the ADRs, which they feel important to report, are ADR leading to death or disability, ADR, which results in permanent or temporary disability, and ADR, which is leading to discontinuation of drugs.

CONCLUSIONS: From this study physician's attitude on various issues related to Pharmacovigilance program could be understood. This situation calls for educating physicians on the importance of reporting all ADRs. Hospital authorities can improve the situation by reducing some workload thereby doctors can devote some time for reporting ADRs. Availability of noticification forms and other logistical issues should be sorted out for the improvement in situation.

ID-77

DRUG SAFETY IN SURGERY SET-UP

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INTRODUCTION: The occurrence of infection in the postoperative wounds continues to be one of the serious complications from the time immemorial. Advancement in pharmacotherapy, emergence of drug specialists has changed the scenario of therapeutics for surgeons.

METHODS: Present study was done to evaluate the safety of prophylactic antibiotics in surgery and to study the importance of adverse drug reaction monitoring in a surgery set-up. A prospective study was done from September 2004 till May 2005 to assess adverse drug reactions with prophylactic antibiotics as one of the secondary objective. Retrospective literature review from January 1986 till August 2006 was done to know the importance of drug safety among the surgeons from PUBMED, MEDLINE, EMBASE, relevant surgery-clinical pharmacy journals with key search terms as "Drug usage in surgery", "Surgery and drug safety" and "Pharmacist role in surgery". A total of 222 cases were evaluated during the prospective study.

RESULTS: Out of total cases, 6(2.7%) patients

developed adverse drug reactions (ADRs) with prophylactic antibiotics. Diarrhea was the commonest (33.3%) of the total ADRs. Cefotaxime, Amoxicillin-clavulanic acid and metronidazole were the prophylactic antibiotics associated with ADRs.

CONCLUSIONS: Literature review revealed antibiotics as the major class of drugs causing ADRs in a surgery set-up. Teamwork involving pharmacist in the surgery team gave a positive impact with respect to drug usage. Need for vigilant approach in monitoring and reporting of adverse drug reactions among the surgeons is highlighted. Drug expertise with safety in specialties like surgery is needed.

ID-85

TOXICITY IN HERBAL MEDICINES AND NEEDED STRATEGY

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INTRODUCTION: 'Herbal Medicine is a hollistic medicine also known as traditional medicine in the history of Indian system of medicine. Now a day's herbal medicines are widely used, to treat chronic disorders; because people believes it has an good therapeutic effect & less side effects. The different varieties of the classification of minerals in herbal medicine added intentionally for the better therapeutic effect. Large quantities of ayurvedic herbal drugs were been exported to many countries. Various studies suggest that 20 percent of herbal drugs are contaminated with heavy metals without following WHO guidelines. The health care department from Canada warned the population not to consume the imported herbal drugs from India, which causes severe toxicity. This may be due to excess amount of metals present in herbal preparations, improper processing methods of the minerals, poor cultivation methods & harvesting, misidentification of herbal plants and interaction of herbal drugs with allopathic medicines.

CONCLUSIONS: The study gives the information about the factors influencing herbal drug toxicity and the remedies, which should be adapted by manufacture in companies and strategies taken using protocols to avoid herbal drug toxicity. Which was declared by the Government of India. So that we can improve the international marketing of herbs mineral drugs. This ample information states that the factors of herbal - drug toxicity, and the remedies that have to be adapted by the manufacturers of the herbal products. It also emphasizes the protocols for avoiding herbal drug toxicity, which was declared by the Govt. of India. So that we can achieve the international marketing of herbc-mineral drugs. The results of this study highlights to follow WHO guidelines.

ID-86

REGULATORY REQUIREMENT FOR THE DEVELOPMENT OF COSMETIC PRODUCTS.

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INTRODUCTION: Regulatory status of the manufacturing, sale and import of cosmetics may necessarily not be same in India as in USA, Japan, Australia, European Union or Canada and vice versa. The regulatory developments of cosmetic are required to minimise the compliance burden on industry while maintaining and enhancing human health, safety and environmental standards. The regulation of cosmetic products in India will be the same with international regulatory standards and therefore minimise trade barriers. At present regulatory challenges of cosmetics are different from other industrial chemicals. Until now, it was regulatory practice for a product to be deemed a cosmetic if it was not a therapeutic good. Some products are currently lying at the regulatory interface between cosmetics and

therapeutic goods. The description of such products as a medicine or a cosmetic is not easy, and a decision often involves some subjectivity. To improve regulation at the interface for identified product types, including changes that could enhance the transparency and useability of existing regulatory documents. The present regulatory arrangement for regulating products at the cosmetic-therapeutic interface is inadequate. There is an urgent need for clarity in the demarcation between cosmetic products and medicines. Industry and government organisations are to be supportive for regulatory development. The affected parties, i.e. Government, industry and the community were involved from the outset and are expected to play a significant role in the implementation phase. Hereby the implementation of regulatory policy is required to provide clarity and transparency for industry, Government and consumers, as well as enhance environmental and occupational health and safety aspects of cosmetic.

ID-87

POTENTIAL DRUG INTERACTIONS AMONG ANTIMICROBIALS AND NSAIDS - THEIR IDENTIFICATION AND SOFTWARE ASSISTED INTERVENTION

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INTRODUCTION: A survey was conducted on the potential drug interactions among freely supplied antimicrobials and NSAIDs maintained in the Pharmacy of a large tertiary care hospital. Several potential drug interactions are often encountered in various prescriptions, but remain unnoticed, because hospital Pharmacists are unable to play the role of prescription auditor/ validator. It is alarming that both the inpatients and outpatients are at considerable risk of adverse reactions due to drug interactions. Out of the drugs studied, Rifampicin was found to interact with most other freely supplied antimicrobials and NSAIDs, followed by aspirin, diclofenac, chloroquine, doxycycline, metronidazole, quinine, erythromycin, ampicillin, benzyl penicillin, ibuprofen, and cotrimoxazole, in the order of decreasing frequency of interactions. The inherent drawback of hospital pharmacists in India is lack of Clinical Pharmacy training and skill in identifying, recognizing and initiating intervention in such situations. Obviously, computer assisted prescription validation may be an important way out.

METHODS: Hence, pilot software incorporating the database of drug interactions among these agents have been devised to demonstrate that the system, if implemented at the dispensing counters, might reduce the risk of drug interactions due to polypharmacy practice and may serve as an essential tool in disseminating Drug Information.

RESULTS: It is envisaged that the digital system may subsequently incorporate ADRs, allergies and other details about the drug and might be integrated with patient medical records to efficiently curb the potential of serious drug interaction consequences.

CONCLUSIONS: This might also lead to a practical starting point for the clinical role of the hospital pharmacists in rational therapeutics.

ID-89

A SURVEY ON THE PREVALENCE OF BACTERIAL INFECTIONS AND THE TREATMENT PATTERN OF CHILDERN IN HISAR DISTRICT OF HARYANA

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INTRODUCTION: Many children are affected by bacterial infections. These are dysentery, enteric fever, septicemia, pneumonia, and lower respiratory tract infections. A survey was done on the prevalence of bacterial infections and the treatment pattern in children in Hisar district of

Haryana.

METHODS: An enquiry form was used to collect the data using case sheets of children suffering from bacterial infections. The survey was of about four months.

RESULTS: The main reasons for the poor health of the children were found to be malnutrition and poor sanitary conditions. From this study it was found that more than 48% of the children were suffering from dysentery. Other prevalent diseases among the children were found to be lower respiratory tract infections (22.45%), septicemia (13.55%), pneumonia (8%), enteric fever (6%) and tuberculosis with meningitis (2%). The antimicrobial drugs usually prescribed by the physicians are fluoroquinolones, cephalosporins, amikacin, ampicillin, gentamycin, INH, rifampicin, streptomycin, pyrazinamide, ethambutol, thiacetazone, kanamycin, ethionamide, cycloserine and chloramphenicol. The other co-prescribed drugs alongwith antimicrobial drugs were frusemide, dexamethasone, prednisolone, mannitol, rantadine, paracetamol, domperidone and metaclopramide. Generally the order of the dosage form prescribed was syrups followed by injections. It was also found that the treatment pattern for the same diseases by different physicians was found to be varying.

CONCLUSIONS: It is concluded that furthermore studies are needed to analyze the motives of the prescribers and to plan for improving the prescribing practices.

ID-90

STUDY OF PREVALENCE OF SELF MEDICATION WITH NSAID'S IN TWO DISTRICTS OF HARYANA

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INTRODUCTION: Self-medication is the treatment of common health problems with medicines without medical supervision. It has long been a feature of the lay health system. Lack of adequate knowledge about the drug, poor legislation, easy availability etc., plays a major role for the same. The present study was conducted to assess the prevalence of self-medication with NSAID's in two districts (Sirsa and Hisar) of Haryana.

METHODS: 100 families having 563 members were selected. A semi structural questionnaire was used for collecting information from family members. The prevalence of self-medication with NSAID's was found to be 39.4%. and it was more in men (41.7%) than women (37.5%). Higher the educational status, higher was the prevalence (59.8%).

RESULTS: It was found to be higher in families having income more than 1 lack per annum (51.04%). 87.8% of persons were using these drugs for treatment of headache, followed by fever (68.5%) and muscular pain (47.7%). Paracetamol was the choice of drug for majority (82.4%) followed by Diclofenac sodium (68.5%). 60.4% were aware of name of drug while other identified the drug by its physical appearance. Previous prescription and advices from others are the sources of self-medication.

CONCLUSIONS: Nearly 40% of sample population is on self-medication and this has to be minimized o reduce the hazardous effects.

ID-48

EFFECTIVENESS OF DOTS THERAPY IN TUBERCULOSIS PATIENTS IN BANGALORE RURAL DISTRICT

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INTRODUCTION: The world is in the midst of a remarkable resurgence of tuberculosis. In India, approximately 5,00,000 people are affected by tuberculosis each day. There are 5,000 people infected by tubercle bacillus. Also, in some developing countries, rates of active tuberculosis have doubled. DOTS (Directly Observed Treatment Short course) is a

comprehensive strategy for systematic diagnosis and effective treatment of tuberculosis Obejective of the of the study have the Survey of tubercular patients in Bangalore rural district undergone for DOTS therapy and study the effectiveness of DOTS therapy and its importance.

METHODOLOGY: It is a retrospective study; the data was collected from four different tuberculosis units of Bangalore rural district from January 2003 to August 2006.

RESULTS: A total number of 47,819 patients were diagnosed as tubercular patients among 51,92,049 patients who visited outpatient department. Among them, 3,954 patients were sputum positive. A cumulative statistical data of each year including follow-up data of patients was prepared, which includes sputum diagnosis, different treatment phases given to patients.

CONCULSION: The study revealed that the DOTS therapy is effective in Bangalore rural district tubercular patients. We observed that DOTS therapy is more effective and the outcome is better.

ID-54

PREDICTION OF SELECTED BIOPHARMACEUTICAL PROPERTIES AND SPECTRA OF FEW HYPOTHETICAL EXCITOTOXINS

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INTRODUCTION: Neurodegenerative disorders such as Alzheimer's disease, Hungintons chorea, Parkinson's disease, AIDS dementia, epilepsy and amyotropic lateral sclerosis are examples of progressive diseases, where compounds interacting with the GABAergic and/or glutamergic receptor systems may be of therapeutic value. The prominent symptoms of Alzheimer's patients are cognitive impairment, memory deficits, etc. Glutamate receptors play an important role in synaptic plasticity associated with learning and memory functions, and these aspects open interesting therapeutic possibilities for glutaminergic receptor ligands to improve cognition and memory in Alzheimers patients. Oral administration of drugs is the most preferred, easiest and compliance route of administration. To be orally active, they must possess sufficient water solubility, partition coefficient (logp), π(pi) values and other biopharmaceutical properties. Prediction of these biopharmaceutical properties before synthesizing the drug molecule is essential for cost effective drug designing and ultimately reduce the overburden laid on common man. The water solubility of the drug molecule greatly influences the routes of administration, its pharmacokinetic parameters and ultimately formulation. Both early in structure based drug designing and later on in clinical development sufficient aqueous solubility is critical. Spectral studies play an important role in structural elucidation. Glutamic acid was taken as a lead molecule and few hypothetical molecules were generated as possible glutamate partial agonists for which bio pharmaceutical properties and oral activity were predicted by "emperic" & "analytical" approaches and " Lipinskis rule", respectively. Both IR and NMR (C13 &H1) spectra were predicted by using ACD IR NMR ilabs Software(V.6.0). Among 40 hypothetical molecules some were predicted as water soluble and orally active.

ID-55

PHARMACOVIGILANCE: A TOOL TO MONITOR ADVERSE DRUG REACTIONS

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INTRODUCTION: Drug disasters such as sulfanilamide elixir tragedy, thalidomide tragedy, Practolol tragedy and phenformin tragedy ask about a hidden question, whether

drug breeds death or drug buys time. Obviously drug must buy time and save lives. But at the same time world is also aware about the word Adverse Drug Reactions (ADRs), which must be monitored precisely as it comes under the preview of pharmacovigilance. Pharmacovigilance is the science and activities relating to the detection, assessment, understanding and prevention of ADRs or any other medicine related problems. There is dire need of pharmacovigilance all over the world and particularly in India, in order to promote rational medicinal use in the community and to eradicate unhealthy pharmaceutical practices. It is now the requirement of time to strengthen pharmacovigilance in order to shut down the counters selling banned medicines, so that mortality rate because of use of such drugs could be reduced to the level of zero. Pharmacogenomics is offering new areas of drug research and may prove itself as helping tool to Pharmacovigilance in monitoring ADRs as it involves the entire genome. Various genomic technologies may be applied to the new drug discovery and further characterization of older drugs, which may lead to the development of patient-tailored drug therapy that hopefully would be more efficient and will result fewer adverse drug reactions. Thus pharmacovigilence will certainly be boosted as a tool to monitor ADR.

ID-63

DRUG SAFETY AND PHARMACOVIGILANCE METHODOLOGY IN UNANI TRADITIONAL MEDICINE

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INTRODUCTION: The safest drugs are essential tools for preventive, curative and rehabilitative health care. Unani Medicine, which is an ancient Traditional system of Herbal medicine and more commonly practiced in Asian countries. Study of Unani Medicine in relation with drug safety and quality assurance is thus imperative. Following rules and procedures must be taken into account to avoid any obnoxious effects before the start of treatment by Unani Drugs:

1. The drugs are classified into four degrees, according to their potencies, temperaments and actions, which help in minimizing adverse drug reactions.
2. Detoxification (Mudabbar = shudhikaran) of 3rd and 4th degrees drugs before their use. (A unique procedure and treatment of raw drugs with specific material)
3. Selection of drugs before prescribing
4. Conformity in the principles of treatment with opposite quality of drugs
5. To follow the contraindication of drugs.
6. To choose 'substitution' of drugs in the context of ADRs.
7. Carefully selection of drugs according to weather and climatic conditions.
8. To decide drugs according to the age and physical condition of a patient.
9. To change the route of drug administration if required, e.g. rectal route.

Despite the above precautionary measures, some cases of ADRs are still being reported due to mis-identification The increase in reports reflects a rising awareness that these natural products may also cause harm.

ADR reporting systems for traditional medicines particularly from the traditional practioners must be generated.

Instructions for Authors

Aims and Scope:
The Journal of Pharmacovigilance & Drug Safety (JPDS) is an official, and peer reviewed journal of Society of Pharmacovigilance, India (SOPI), that aims to encourage the practice and research in rational drug usage drug safety and Pharmacovigilance. Hence the journal invites submission of original research articles, reviews, commentaries and case reports on rational drug usage, therapeutic drug monitoring, drug safety, Pharmacovigilance, pharmacoepidemiology, drug surveillance, community medicine, community pharmacy National or International Drug Policies and related issues. Journal will not consider basic drug research in animals unless they have direct relevance to the above-mentioned topics.

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Introduction: It should provide background information providing rationale of the study giving pertinent reference. Introduction should always end with objective of the study/ article.

Methods: One should describe selection of the observational or experimental subjects (Patients including controls) clearly. The age, sex and other important characteristics of the subjects should be identified. The definition and relevance of race and ethnicity should be ambiguous. Give references to established methods including statistical methods.

Results: Present your results concisely and in logical sequence in the text, tables and illustrations. Tables and figures should be devised in such a manner that the findings are accurately conveyed. The same data should not be used for more than one figure or table. Interpretation of the data should be given in the discussion only.

Discussion: The discussion must interpret the results and relate them to existing knowledge on the topic in as lucid a manner as possible, avoiding repetition or duplication of information. Include the implications of the findings and their limitations, including implications for future research. Relate the observations to other relevant studies. It should always end with concluding remarks. Link the conclusions with the goals of the study but avoid unqualified statements and conclusions not completely supported by the data. Recommendations, when appropriate, may be included.

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Organization as author: The Cardiac Society of Australia and New Zealand. Clinical exercise stress testing. Safety and performance guidelines. Med J Aust 1996; 164:284-4.

Books and other Monographs: Personal autor(s): Ringsven MK, Bond D. Gerontology and leadership skills for nurses. 2nd ed. Albany (NY): Delmar Publishers; 1996

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Acknowledgments: The author should acknowledgment advice from colleagues, financial/ technical assistance, gifts etc. after obtaining consent from the people whose assistance is acknowledged. Any other footnotes may be given here.

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