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APPROACHES AND ROLE OF PHARMACIST TO CONTROL INAPPROPRIATE MEDICATION USE AMONG INDIAN CITIZENS

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ABSTRACT

This article attempt to emphasis on medication misuse in Indian health care settings and citizens, discusses the medication misuse and medication errors, and try to explain the steps, approaches and strategies that could be taken to minimize and prevent these medication errors. Simultaneously, a brief explanation about present pharmacy practice scenario, the present role of pharmacist in India, services and responsibilities in preventing these medication errors in public as well as in health care settings is included.

Key Words:- Medication Errors, Pharmacist, Pharmacy Practice, India.

INTRODUCTION

Medication misuse is growing problem worldwide particularly in India due to increase number of prescriptions and OTC drugs, easy availability of medications, low health literacy rate, alternate use by traditional drugs, more population, lack of basic facilities in hospitals because more than 72% population residing in villages. India is second most populated country in the world, with over 1.21 billion people (2011 census), more than a sixth of the worlds population. Already containing 17.5% of the world's population, India is projected to be the most populated country by 2025, surpassing china, its population reaching 1.6 billion by 2050 (BBC News, 2004; US Census, 2011). Its population growth rate is 1.41%, ranking 102nd in the world in 2010 (WBID, 2012). As per the CIA, A World Fact book demographic statistics estimated 30.8% of Indian population between 0-14 (2009 est). As per the national institute of aging 16% of Indian population is 50 and above and 5.3% 65 (2009 est). Children and old age population are frequently visits to

clinics. Most of the old age people daily take about three to four drugs. In USA having the population of 310 million (as per UN 2011) prescription dispensed in 2005 is 3.4 billion (Anonymous 1). There is no official data available in India, but we can imagine the prescription dispensed in India would be higher as compare to USA because of more population and less health literacy rate.

As per the pharma knowledge base website Indian pharma market, which is branded and generic mixed market have 70000 (Miller L, 2006) brands and this number is growing every year. As per the institute for safe medication practices USA market have more than 10000 brands⁶. The growth of the Indian over-the-counter (OTC) market (non-prescription medicines) has outperformed globally. Globally, the Indian pharmaceutical industry ranks third in terms of volume and 14th in terms of value. As of 2011, the Indian OTC market estimated to be worth 9,000Crore (\$1.8billion) with annual growth rate of 23%. Indian Pharma industry estimated to be 95,000 Crore (\$19 billion) in FYO9.

Deaths in India due to adverse drug reactions are estimated to be 400,000 annually and 720,000 drug reactions every year (Anonymous 2). (A report from Institute of Medicine states that in USA 44,000 to 98,000 deaths were reported due to preventable medical errors;

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Nov 1999). Six out of ten patients visit doctors in India receive prescription for inappropriate medications. It causes injury, suffering and highest death rate in India. The question is how inappropriate medication use can be controlled. What is clear is that, inappropriate medications use is caused by human failure and negligence when the medications are in the hands of health care providers, patient or consumers. WHO estimated that 50 % of drugs prescribed are useless. 2.3 % of person go below poverty line are due to cost of treatment (Ranjit R, 2011).

Importance of Reporting and Monitoring Medication Misuse in India

In India, officially very few data is available regarding improper medication use or medication errors. Several well planned and design studies should be carried out in India to determine the depth of problem and to develop effective strategies to solve such problems in future. Such official studies are required also because of the following reasons:

1. India is second most populated country in the world where more than 72.2% of population in India residing in about 638,000 villages and reaming 27.8% lives in 5100 towns and cities (Rural-Urban Distribution, 2001). This indicates a low health and education literacy.
2. Nationwide approximately 500,000 ((Rural-Urban Distribution, 2008) sale premises and more than 80% pharmacy stores running by diploma holders or normal person who does not have degree in pharmacy so there is no proper system for medication and dispensing practices.
3. Nationwide there is no system to report and alert the medication errors and any hazardous situation that arise from misuse of medications.
4. Nationwide including hospitals there are no strict and compulsory rules regarding medication errors.
5. Inadequate facilities in healthcare systems.

Causes or Contributing Factors for Medication Misuse

1. As mention above in India there are more than 70,000 mixed and generic branded drugs and no official data about number of OTC products available, that include natural and herbal products, and this number is increasing annually. So increased growth in the number of available medication may leads to more consumption and potentially greater risk for medication misuse. A recent study in US indicates that the number of paracetamol toxicities is growing and accounts for more than 40 % cases of acute liver failure because of different and confusing brands of paracetamol on over the counter (Anonymous 3).
2. Advertisement through television, magazine, newspapers, internet and social media networking has

become a leading form of marketing done by pharmaceutical companies to promote new medications. Overwhelming positive advertising claims on such media lead to improper or excessive medication use, since many drugs advertised through such media may not be right for consumer specific condition or illness. For example advertisement shows disprin (contain aspirin) relive headache within fifteen minutes but advertisement never shows what type of patient contraindicated for this drug. After watching this advertisement if an asthma or heart patient who is already on clopidogrel and aspirin combination, take this medication, chances of bronchoconstriction and bleeding can occur to these patients respectively.

3. Through nationwide it has been observed that, the general stores who is running by non-pharmacy persons who does not have any knowledge of medicines involved in sales of schedule H drugs (substance specified in schedule H shall not be sold by retail except on and in accordance the prescription of registered medical practitioner).

4. On paper every pharmacy store must have a pharmacist either diploma or bachelor of pharmacy onsite and drugs should be dispense by pharmacist or if any other person is assisting the pharmacist who is not holding any degree of diploma or bachelor of pharmacy should not dispensed medication directly to the patients unless and until it is double checked by pharmacist. In practice few pharmacist are onsite in the pharmacies and dispensing undertaken by the owner, assistant or attendant of the owner. Relative or cousins of pharmacist encase if the pharmacy is run by pharmacist. A study conducted in 2005 found that about 50% pharmacies in India function without pharmacist (Larsen AM *et al.*, 2005).

5. Low health literacy rate in India is one of the major problems. Health literacy is different from literacy. "Health literacy represents the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand, and use information in ways which promote and maintain good health".

"Health literacy means more than being able to read pamphlets and make appointments. By improving peoples' access to health information and their capacity to use it effectively, health literacy is critical to empowerment. As per the national literacy mission, the literacy rate of India is increased to 74.04% (as per 2011 census) even though the figure is less than the world literacy rate of 84% (Basak SC *et al.*, 2005), no government policy is mainly focussing on health literacy rate, however multiple government reports on health issues such as tobacco use, health equity, non-communicable diseases, the use of information technology for health refer to the importance

of health literacy. Poor health literacy can lead to consumers misusing their medications, less likely to adhere to prescribed treatment and often fail to seek preventive cares. The studies show that those individuals having low health literacy rate than adequate have more risk of hospitalisation (Crossette, Barbara, 2009).

6. Most of the people in India think that only allopathic medications have the side effects or adverse effects and traditional medication most of these derived from herbs are free from side effects. Patients who have been taking traditional herbal remedies may develop adverse drug reactions. It is not always easy to identify the responsible plant or constituents. In Indian market most of the herbal remedies sales without any evaluation studies, scientific data and license approval from the central or state drug regulatory organization that is by CDSCO or state Drug control departments. In USA the studies shows that nearly 12 million people have experienced side effects or adverse reaction from using herbal remedies (Wolf MS *et al.*, 2006).

7. About 30.8% of Indian populations are in the age of 0-14 (as per 2011 census) and about 5.3% above 65 years. Children and old age people are more prone to medication misuse and many medication errors are possible in children and old age people.

Many medications are not indicated for children's use for minor ailments. Parents do not seek advice of physician and give these medications to their children and when problem become severe they go to the physician that leads to hospitalization and increases the cost of the treatment and sometimes it may be fatal and leads to permanent injury or death. Most of the parents are confused about measurement of liquid medication and measuring devices. They do not understand difference between a teaspoon and tablespoon. A study demonstrated that 47 % of parents give their children an improper dose of OTC fever medicine (Eisenberg D *et al.*, 1998).

About 15% of elderly people in India admitted to hospitals are due to adverse drug reactions and non-compliance (McMahon S *et al.*, 1997). The old age people frequently visit and take on average four or more drugs, so the chances of adverse drug reactions and drug – drug interactions are common.

Medication Misuse in Clinical Health Care Settings

Medication errors are a well known worldwide phenomenon. It is a big problem in health care industry. In India officially there is no estimation of cost related to morbidity and mortality that occurs due to medication errors in health care industry but in USA this figure is about \$177 billion (Malhorta S *et al.*, 2001). There is at

least one death per day and 1.3 million people are injured due to medication errors (Ernst FR, 2001).

The national coordination council for medication error reporting and prevention (NCCMERP) define medication errors are "any preventable event that may cause or lead to in appropriate medication use or patient harm while the medication is in the control of health care professionals, patient or consumers" (Anonymous 4).

Medication use is a step wise process that include, medication prescribing, order processing, dispensing, administration and effects monitoring – any one of which could leads to medication errors.

Common causes of medication errors include wrong diagnosis, prescribing errors, drug –drug interactions, inappropriate dose calculation, wrong drug administration, lack of patient education and counseling, wrong or unreadable labeling, sound alike and look alike packaging of medications etc. Most medical errors do not result in medical injury, though some do, and this injury, is termed as adverse medication events.

So, adverse event is defined as "an injury caused due to medication errors, rather than by the underlying disease or condition of the patient" (Anonymous 5).

Medication errors that can leads to adverse events are wrong drug, wrong dose, wrong frequency, wrong route, wrong time, wrong preparation, wrong documentation, omitted dose of drug, allergy information missing, inappropriate monitoring, etc (Jonathen RN *et al.*, 2004).

Approaches and Strategies to Prevent Improper Medication Use

1. As mention above too many drugs are available in the market. So every pharmacist before dispensing any medication should be thoroughly double check and read the label when dispensing look alike and sound alike packaging drugs. Use of electronic technology is an advanced method in the medication error prevention and management. Now most of the countries are using bar code dispensing system. The machine read the bar code of strips and displays the name, batch and expiry date of medication. The drug regulatory organization in India should instruct all the pharmaceutical companies to put bar code on strips (same like what we are seeing today on soaps; creams etc).

2. The patient education programs should be start to give awareness regarding not to use the advertisements drugs unless and until consult by physician and expert pharmacist and the government should banned those advertisement who is claim false results.

3. The state drug control department should take a legal action about those general stores who is involved in

selling schedule H drugs, so that they should not repeat the mistake again.

4. It is the responsibility of every state drug control department to inspect the pharmacy stores and inquire about the presence of pharmacist. A legal action should be taken if pharmacist is not present onsite of pharmacy.

5. Health literacy rate can be enhancing by providing adequate education on disease and appropriate medication use. Healthcare professionals should educate the patients regarding correct medication use, potential risks of medication, storage of medication and future consultation. The health professionals and government should design such a program and mission that improve patient safety and reduce medication errors.

6. Health care professionals should educate the people regarding use of traditional and herbal medications. They should give awareness to inquire the constituents, indications, drug-drug interactions and use of herbal remedies.

7. Education program about proper use of medication should be started among elderly patients and parents of children. Health care professional should show practically the difference between teaspoon and tablespoon and metric measurements such as millimetres, one gram become how many milligrams etc. The parents should not allow their children to take self medication; they should give the medications under their guidance.

8. The approaches and strategies employed to prevent medication errors in health care settings is by providing proper training and guidelines to their staffs and adopting new technologies like e-prescribing, dispensing of medication through barcode code system, automatic dispensing machine (e.g., Pyxis Medstation), through unit dose system etc. The Institute of Medicine (IOM) 2006 report recommends two technologies to improve dispensing process in health care industry (Reddy LKV *et al.*, 2009).

One is electronic prescribing or e-prescribing or computerized prescription order entry (CPOE) and secondly electronic health records (EHR).

Implementing these two techniques in health care industry could remove lot of medication errors. For example implementing e-prescribing removes errors from illegible and poorly hand written errors, ensuring proper terminology and approved abbreviations, e.g., the drug should give by IM, IV, sc, Oral etc, Ambiguous orders, omitted information. Newer COPE softwares available in India, allows physicians to order prescription with accurate patient information.

Electronic health records helps pharmacist and doctors to review prescription, potential drug-drug interactions, medication allergies, over and under dose, any medication

events that may happen later on etc. By using these techniques medication errors can be reduced and patient safety can be improved in health care settings.

Role of Pharmacist in Medication Error Management

Effective medication therapy and patient safety requires cooperation by all members of the health care team of physicians, nurses, pharmacist and other health care providers.

But unlike other developed countries the public perception in India about pharmacy and pharmacist is very weak. In India the pharmacist are not much involved in drug selection, patient care and in clinical practice. The general population thinks and imagine, pharmacist as a drug traders and obviously not better than the general stores owners.

Patients and consumers consider a visit to pharmacy same like a visit to grocery shop to purchase food items. With introduction of pharmacy practice and Pharm D programmes in India, windows are open for pharmacist to apply their knowledge and skills to prevent medication misuse and to create a safer health care environment.

Pharmacist can prevent medication errors to a greater extent by several means like by providing current and updated information on medication use to other health care provider's. This would greatly minimize the medication errors in clinical health care settings. The other most important service of pharmacist that lacking nationwide is, counseling the patients about safe and proper use of medication. This minimizes the medication errors especially patient /consumer related medication errors. In clinical health care setting, pharmacist can contribute his service in collaborative drug therapy management (CDTM). This is a multidisciplinary process that involves selecting proper medication therapies, educating patients, providing drug therapy monitoring and continually assessing outcomes of therapy. But to do this, pharmacist must shift from dispensing centred focus, to focus on patient care services. The activities of a pharmacist in CDTM may include initiating, modifying, monitoring, ordering and performing laboratory and related tests, assessing patient response to therapy, counselling and educating patients on medication and administering medications. A study in US estimated that \$76 billion could be saved and 120,000 deaths per year could be prevented if pharmacist were fully utilised in health care settings (Cannon E, 2006).

Another important service the pharmacist play a key function rule is in, hospital pharmacy and therapeutic committee and also can involve in planning and conducting research in the area of patient safety.

SUMMARY AND CONCLUSION

Medication misuse is a growing problem worldwide but India faces massive challenges in providing better health care for its vast and growing population due to low health literacy rate, easy availability of medication, growth in number of medications in Indian market and above mention problems. Medication misuse is a major threat to patient safety. Its increased hospital stay, cost of treatment, disability, morbidity and mortality. Therefore, identifying the causes and attempting to prevent medication errors are vital in public and clinical health care settings. As most of the medication errors are avoidable and can be prevented by interventions. In among all these, pharmacist plays a key role by adopting various strategies in preventing medication errors. Improved knowledge, adequate training and commitment of healthcare professionals are important in improving the patients' safety and minimising /preventing the medication errors.

In India, among health care profession, the pharmacists are portrayed as assistant to doctors. This is not surprising because the national health policy 2002 (Johnson 1995), while declaring current health care professionals levels, maintain a stoic silence about pharmacist. The Indian public health formulated under the national rural health mission (NRHM) also does not place much emphasis on the role of pharmacists as compared to other health care professionals such as nurses and laboratory technicians. In union government sixth pay commission report, pharmacist has been placed in the lowest band and structure along with other non technical persons (National health Policy, 2002).

In nutshell, Indian health care management is advancing and growing, with rapidly occurring changes in the health care delivery, it is hoped that pharmacy practice will change accordingly.

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