1. INTRODUCTION

Affordability and availability of essential medicines has always been a great challenge for the healthcare provider world over, and especially in the developing countries like India. Considering access to essential medicines as an integral part of the right to health, (Hogerzeil et al., 2003) it is global obligation to ensure the availability and affordability of essential medicines, to the public at large. However, as per the World Health Organization one third of the world’s population lacks access to the essential medicines (www.haiweb.org/medicineprices). The situation is still grave and disheartening in poor countries where a large proportion of their population lives in poverty and their condition is characterized by high rate of mortality, morbidity and disability.

Everyday millions of people throughout the world go without treatment because they cannot afford the medicines they need. Up to 90% of the population in the developing countries have to buy medicines through ‘out of pocket’ payment as opposed to around 20% in high income countries. Rapidly rising cost of healthcare and high prices of medicines are a growing concern worldwide and a major barrier to the use of medicines and better health of the public. The challenge therefore, for the governments is to choose mechanism to curtail increase in healthcare costs without further disadvantaging those who need medicines for ongoing healthcare.

The medicines are essential commodity (drugs are covered under the definition of ‘essential commodity’) as defined under section 2(a) (iva) of the Essential Commodity Act, 1955 in India (Malik, 2010). It is the only commodity in the world where the decision regarding the purchase thereof is taken not by the consumer but by a third party. Further it is a unique commodity whose need is immediate, obligatory and involuntary. Purchase or non-purchase based on price may mean choice between life and death. Often, the patient does not have any knowledge of the medicine purchased by him and is on the mercy of prescribing physician or dispensing pharmacist.

As a matter of fact, most of the developing countries do not have well-defined policies on medicine prices; therefore, they suffer because of price variations within the country and also among such countries. It has also been shown that there are wide variations in medicine prices among developed and developing countries. The price of same medicine vary from country to country depending upon, source of its procurement,
government policies, the form in which it is marketed (branded /generic/bulk pack/dosage form etc.) and the facilities from which the patient procures. In many countries duties, taxes, mark-ups, and other costs are high thus making the medicines unaffordable for larger section of the society. Inadequate and poor distribution system of medicines also affects its availability (Pecoul et al., 1999).

While people in developed countries generally have insurance or other subsidies that cover most of the cost of their medicines, those in poorer countries with under developed health care system have to pay the full cost of almost all their medicines themselves. India is one of the countries in the world where people incur over 80% 'out of pocket' expenditure in seeking healthcare (Creese et al., 2004). After dowry, medical care is the second major cause of rural indebtedness in India, which is pushing its people in to debts, premature death and disability. Thus, price of medicines is a crucial determinant in the management of the healthcare system of the citizens.

India is the 4th largest producer of medicines and 10th largest exporter of pharmaceuticals in the world, and has contributed to making generics at low prices worldwide. But the medicines within India are overpriced and unaffordable, as majority of its population lacks access to the essential medicines, (Creese et al., 2004) a glaring silent violation of human rights that gives sleepless nights to millions of patients leading eventually to their misery and penury. Making available essential medicines to the common man still remains a burning issue in spite of the tremendous growth of pharmaceutical industry in the country during past two decades.

The public health system in India is in a high state of disrepair. The public hospitals and health programs, except in few states, are ill funded and poorly managed. The inadequate budgetary allocation for drug purchases coupled with poor and inadequate system of medicines in the public facilities leads to a situation where the drugs are usually 'out-of-stock'. The patients visiting the public facilities are therefore, forced to purchase medicines from the market. Eventually, a significant proportion of them drift to the private practitioners on whose rationality there is little control: a vicious circle of poverty, ill-health, poor planning and poorer regulations, thus sets in. A decaying public health system and a market riddled by overpriced, irrational, unscientific and therapeutically useless medicines aggravates the lack of access and affordability. It is estimated that most of the medicines prescribed are irrational or in essential or hazardous or a combination of the
three. This acts as a major drain on the finance of the poor and further compromises their access to the medicines they actually need (Gupta, 2007).

High costs of medicines have always been an area of great concern to the health authorities in providing healthcare to the mankind. Efforts are made globally to provide quality medicines to the ailing mankind at affordable prices. To achieve this goal, States are moving towards the use of cost effective generic medicines at a very fast pace, in view of their advantage over innovator/ patent drug product. Since generics are alternative products with same composition & therapeutic action, their comparatively lower cost provides additional benefits to the healthcare providers. The use of generic medicines has been steadily increasing internationally as a result of economic pressure on pharmaceutical budgets and the expiry of patents on widely used medicines. Generic drugs are indispensable in the world over including the developed nations like United States, UK etc.; although the actual costs associated with these medications are less than 13% compared with their branded counterparts (Shrank et al., 2009).

Generic medicines provide the opportunity for major savings in healthcare expenditure because of its substantially lower cost than the counter-part innovator medicines (Janodia et al., 2007). Its popularity can be adjudged from the fact that as on day, majority of the prescriptions filled in U.S. are generic only. Further, in view of the high cost of patented medicines and the fact that most of the essential medicines are going off patent, generic medicines are replacing the patented one speedily throughout the world including the developed countries like U.S.

Procuring medicine with generic name, prescribing lower cost and equally effective generic medicine and dispensing generic medicines will be potentially an important cost saving mechanism in future. Therefore, healthcare professionals have a vital role in promoting use of quality generic medicines through good treatment choices, good communication with consumers and collaboration with each other (Hassali et al., 2004).

The extent to which generic medicines are prescribed and dispensed varies widely among the countries throughout the world. The countries with highest penetration of generics are the U.S., United Kingdom, Denmark, Germany, Netherlands and Canada where generics are promoted and are considered as a tool to contain rising healthcare
costs. In other countries like Spain, Greece, Italy, France etc. where the prices are low, generic products are not actively promoted by the health insurance organizations.

In U.K., all residents are covered by the National Health Services (NHS) and access to medicines is subsidized directly, leaving only a minor role for private health insurance and a nominal charge to be borne by the patient. The health insurance is voluntary in U.S. and in the hands of profit driven private insurance companies leaving a residual role for public health insurance as a safety net for those not able to pay the insurance premium. Thus, health insurance in U.K. is government controlled while it is by and large market driven in U.S. In contrast, there exist no such insurance system in developing countries struggling with growing population and diseases such as HIV-AIDS and the burden of disease is carried by the individual patient and other family members, as a result the patient go without treatment due to financial constraints.

Different countries have framed their own regulatory policies fostering generic diffusion in the pharmaceutical market. The enactment of Hatch-Waxman Act in 1984 was a landmark and major up-trust in the history of American as well as global pharmaceutical generic industry. Its pro-generic provisions led to the overall reduction in the health care expenditure by providing cost effective affordable medicines to the Americans and also increased penetration of generics throughout the world. A major breakthrough of the 1984 Act is that bioequivalent drug products are therapeutically equivalent and, therefore, interchangeable. Presently, majority of prescriptions in US are dispensed as generics illustrating the impact of the US generic promotion policies. Substitution by the dispensing pharmacist is allowed under the US laws to promote low cost generics. FDA also maintains an up to date list of all approved marketed drug products popularly known as ‘Orange Book’ which serves as the primary source for generic equivalency.

European Commission has passed regulations to promote use of low cost generics, *e.g.*, generic prescribing, generic substitution, patient co-payment, incentives to physician, pricing and reimbursement. Importance of generic medicines can be seen in the fact that in 2006 generic medicines represented three fourth of all the new applications finalized under the Mutual Recognized Procedure. In UK the generic market has been successfully developed through financial incentives to physicians and pharmacists and other generic promotion schemes of the government. Although, generic substitution is not permitted, yet
more than 65% of the prescriptions are in fact written now generically, thus allowing for dispensing of the cheapest products.

In Denmark, the use of generics is stimulated through generic substitution, officially publicity campaigns, to promote the use of generic medicines and non-financial incentives for the physicians and pharmacists. The substitution is mandatory if the cost effective generic is available. Most of prescriptions in Europe are written in brand name. In countries where INN prescribing is compulsory, only in Portugal are physicians obliged to do so for all the medicines when a generic product is available. In Germany, generic penetration is driven largely by generic substitution, reference pricing and the setting of prescribing budgets for the general practitioners, making doctors and consumers price conscious.

The Netherlands has implemented a variety of measures including reference pricing, non-financial incentives for healthcare professionals, generic substitution, teaching generic prescribing at universities, and financial incentives for pharmacists who are allowed to retain 33% of the price difference.

Japan, the second largest pharmaceutical market in the world after US, is implementing measures to expand the use of generics amongst the people to cut healthcare costs. The National Health Insurance (NHI) drug price revision in April 2010 has included price cuts for long listed drugs or off-patent medicines for which generics are available. The prices of off patent drugs will drop significantly after the patent period expires due to promoting the uptake of generics in the market. The government is planning to switch around 30% of its prescription medicines to low cost generics by 2012. This new generic focus by the Japanese government will now spur growth of Indian drug majors. Generic companies will outgrow brand drug companies with the support of the government; however, they will intensify mergers and acquisitions among them for survival (Osama, 2006). The acquisition of Ranabxy – a popular Indian company by Daiichi Sankyo is the latest example of the growing popularity of generic in Japan.

Canada adopts a wide range of policies to encourage the use of generic medicines including generic substitution, which is mandatory in most of the provinces, incentives to the pharmacists and physicians and a reference pricing system. The generic medicines on an average provide 40-50% savings as compared to the branded. The generics are
dispensed to fill about 50% of all the prescriptions and the sale of generics is on rise at the rate exceeding 10% annually. The Canada’s Patent Act has Bolar Provisions, as it allows research and development as well as application for regulatory approval of a generic product prior to patent expiry.

China, having 20% of the world population, has only a small portion of the global drug market. The indigenous drug manufacturers produce 97% of the total production as the generic medicines and traditional Chinese medicines. The pharmaceutical market in China is expanding like anything and is expected to capture the global market soon. China is presently known for the producer of cost effective medicines in the world. China has agreed to implement the Trade Related Intellectual Property Agreement of the Uruguay Round. After China’s WTO entry all global pharmaceutical companies have completed their accession in to Chinese market and intend to shift their focus to research and development. China offers abundant human resources and less expensive medical and clinical trials to the global pharmaceutical companies.

Under the Brazilian law it is mandatory for the generics to display the international non proprietary name (INN) in the package, as well as the words ‘Generico’(generic) inside on a yellow strip visible for patients as identification mark to distinguish from branded. The legislation provides for interchangeability of reference drug with a generic medicine. The year 2009 marks the 10th anniversary of the Brazilian generic law that introduced the concept of unbranded generics in the country to facilitate access to reliable medicines for Brazilians. Today four of the six largest pharmaceutical companies in the country are Brazilian and all of them are producing generic medicines. Almost 90% of the generic market is dominated by the Brazilian companies. Branded generics are not allowed. Bio-equivalence test and GMP certification of the manufacturing facility is mandatory. Brazil is the 11th largest drug market in sale-wise and 6th in volume wise in the world. Prices of the generics are about 80% of the price of their counterpart branded medicines. Brazil, like US, also adopts one of the best policies to promote generics in the world.

The generic market in the developing nations is playing important role in creating tough competition in the global medicine market. India, China, Brazil and Russia are making all out efforts to challenge the super powers as far as generics are concerned, and are moving in positive direction. India has made tremendous progress during last few
years to upgrade its contribution to the world generic market and eyes of the entire universe is focused towards India for cost effective quality generics. In view of its established potentials of quality medicines producer, the Indian generic companies are being acquired by the multinational companies, world over to exploit its low cost generic medicine production capabilities.

In India, both the branded as well as generic versions of a drug can be approved simultaneously for manufacturing and marketing purposes by the regulatory agencies as per its federal provisions. Both the versions are subjected to identical quality control tests before marketing. The price control regulations under the ‘Drugs (Price Control) Order 1995’ which regulates prices of selected numbers of drugs in India also apply uniformly on both these versions. Substitution of Schedule H medicines is prohibited and constitutes a criminal offence under the Drugs and Cosmetics Rules 1945. INN labeling is mandatory for both generic as well as branded medicines. Medicines in India, by and large, are sold under a brand (trade) name and are termed as ‘branded medicines’. The medicines manufactured and sold under generic or international non-proprietary name are termed as ‘generic medicines’. Generic medicines have been replaced by and large with the branded-generic medicines in India which are simply generic medicines marketed under a brand name. Many pharmaceutical companies in India manufacture both the versions of same molecule, i.e., ‘branded drug’ which they promote and push through doctors and their ‘branded-generic’ version, which they expect retailers to push in the market.

The Indian Patents Act, 1970 was amended in the year 2005 to gain admittance to World Trade Organization (WTO) and become compliant with Trade Related Intellectual Property Rights (TRIPS), an important WTO regulation. India has joined the developed countries by amending the said Act and agreement to TRIPS.

India is well known for its prolific pharmaceutical industry that offers low cost generics to the world. At home India faces the challenge of equal access to affordable and quality essential medicines for its own people (Kotwani et al., 2007). Despite tremendous pharmaceutical growth in last two decades, access to essential medicines remains an issue for common citizens. Affordability continues to be an important barrier to access of medicines for the poor population (Falkingham et al., 2007). The Indian pharmaceutical industry has become the third largest drug producer (22%) in the world in terms of volume and ranks 14th in term of value, at over Rupees one lakh crore. It has grown from a humble
of Rupees 1500 crore turnover in 1980 to approx Rupees 100611 crore in 2009-10. India exports to the tune of US$ 8 billion to 200 countries including US/EU, accounting for 41% of the exports with total 10560 pharmaceutical units including 2390 bulk drugs units (Chaudhary, 2010; Jharwal, 2010).

Around one in four of all Abbreviated New Drug Applications (ANDAs) in the USA are filed by Indian companies. India ranks second to US in ANDA filing and holds more than 2100 DMF [document filed by the drug maker to register active pharmaceutical ingredient (API's) in the US market] filed with US FDA accounting for 29.25% of the global DMF filed with US FDA. For example, while Ranbaxy ranks around eighth or ninth among the global generic companies in term of sales, it ranked much higher in the number of US ANDA fillings. There were 105 USFDA approved manufacturing facilities in India in 2004 compared with just one in 1990. The figure has arisen to over 170 as on May 2010 and there are 153 European Directorate of Quality Medicine (EDQM) approved facilities which is a testimony of the fact that pharmaceutical products exported from India are of the impeccable quality. No other country in the world has anything near to 100 FDA approved facilities except India. It is generally accepted that cost of doing research in India is between one fifth to one seventh of the cost of doing research in Europe or the USA. Therefore, pharmaceutical companies are looking to India for their drug discovery research as well as generic pharmaceutical research.

Despite the increased interest in lower cost generic medicines in developing and transitional countries, evidence of the effect of generic medicines policies in such countries is sparse. Lack of effectiveness of generic policies in term of lowering the prices and in turn increasing the market share of the generic medicines is particularly attributed to their inability to consistently demonstrate medicine quality. The misconception among the public as well as the physician that the innovator/branded medicine is safer and better than generic; further exaggerate the situation and tends to result in greater use of expensive branded product, however no scientific explanation can be given for the same. Although the generic medicines are bio-equivalent to their innovator counterparts and are produced in similar facilities according to good manufacturing practices (Davit, 2009) yet it is widely believed and perceived even in developed world by patients, as inferior in their therapeutic efficacy and quality to branded products (Shrank, 2009; Hassali et al., 2004). Apprehensions about their quality and therapeutic efficacy also haunt the minds of the
prescribing physicians throughout the world. Marketing practices adopted by the manufacturers of branded medicines also propagate the belief that generics are of inferior quality, as reported from countries in Central and Eastern Europe and independent countries emerged from former Soviet Union (Joncheere et al., 2003).

Extensive comparative bio-equivalence studies on generics and their branded counterpart have demonstrated that the generics are therapeutically bio-equivalent to their innovator counterparts (Davit, 2009). During a systematic review study comparing clinical characteristics of generic and brand name drugs used in cardio-vascular diseases it was found that the generics as well as generic branded cardio-vascular drugs are similar in nearly all clinical outcomes (Kesselheim et al., 2008).

Worldwide, generics have the potential to provide substantial reduction in costs of health care, to the government, insurance agencies, hospitals, and most important, patients. However, there exist many myths / misconceptions regarding the generics, some of which are discussed below:

- The quality and therapeutic efficacy of generics have been compromised to make the less expensive products.

- Generic medicines take longer time to work as compared to their branded counterpart.

- Generic medicines are manufactured under compromised facilities.

- Lack of parity of regulations on generic vis-à-vis branded medicines.

- Generics have different (reduced) efficacy than the branded products, since they may have different colors, flavors or combination of inactive ingredients than the branded products.

Keeping in view the huge price variations between the generic and branded medicines and also the pro branded perceptions of the physicians, a detailed comparative evaluation study on the quality of generics vis-à-vis branded medicines was planned. The study envisaged to know if the quality of a medicine is related to its price and also if a branded medicine is better than its generic counterpart and as to whether the physicians know that drug manufacturer adopts similar quality control parameters while producing
these different variants of same molecule. The study also aimed to explore as to why there exist enormous variations in the prices of generic and branded medicines if their quality is at par. Such studies have not been carried out in the past, in India, and also in several other countries. This research work is aimed towards exploring the truths behind the myths / misconceptions about the quality and efficacy of generic medicines prevalent among the healthcare providers especially the prescribers. The work is aimed specifically towards exploring the regulatory guidelines concerning the use of branded versus generic drugs, with a specific focus on USA and India. Further, attention has been focused in the State of Haryana, wherein the prescribing habits of physicians have been explored, with a view to seek their views on the generics versus branded products. The role as well as perceptions of retail pharmacists, who act as direct sellers to the patients, has also been explored, in a survey in the State of Haryana, in the area of generic versus branded products. To actually verify the truth behind the above mentioned myths / misconceptions, marketed samples of some generics / branded products were picked up, from the market, and tested as per pharmacopoeial standards. Lastly, samples of some generics from “Jan Aushdhi Stores”, a chain of medical stores promoted by Government of India to offer quality medicines at much lower prices, were also picked up and tested as per pharmacopoeial standards, comparing them with their branded counterparts available in the market. The results conclusively disapprove the above myths / misconceptions and strongly substantiate the quality of generic products, in spite of their lower costs. Regulatory guidelines of several countries have been analyzed, with a view to provide useful recommendations, for improvement in the Indian laws, regarding the use of generic drugs.