ABSTRACT

Objective: To study antibiotics use in a tertiary care hospital in Karachi, Pakistan for assessing the extent of overuse or polypharmacy.

Methodology: A descriptive study with convenience sampling was conducted from May to August 2014 in three different wards of Civil Hospital, Karachi, Pakistan. Results: Three different wards (Pediatrics, Cardiology and female Medicine wards) were visited and patients’ medication records were studied. In Paeds ward, n=54 patients’ medication records were studied (age 6 months to 12 years). Most commonly prescribed antibiotics were found to be ceftriaxone (59.25%), Amikacin (33.33%) and Metronidazole (24.07%); overall 24.07% cases of overuse/polypharmacy were identified. In cardiology ward, n=51 patients’ medical profiles (age 30-80 years) were studied to whom Ceftriaxone and Amoxicillin clavulanate were the most commonly prescribed drugs (64.70% and 19.60% respectively); 11.76% cases of drug overuse/polypharmacy were found. In female medicine ward, 71 patients’ medication records (age 25-70 years) were studied to whom Amoxicillin clavulanate and Ceftriaxone (26.76% and 16.90% respectively) were the most prescribed antibiotics; 12.67% cases of drug misuse or underuse were spotted. Conclusion: Standard treatment guidelines should be followed by the practitioners to promote rational use of drugs. In pediatrics, 3rd generation cephalosporins should be prescribed with care since there is information of growing resistance of micro organisms.

KEYWORDS: Antibiotics, Cephalosporins, Amoxicillin Clavulanate, Amikacin, Polypharmacy.
INTRODUCTION
The appraisal of quality of health care is getting international consideration (Marry et al., 2006) and medicines are significant and vital factor that give integrity to the health care delivery system (Odusanya and Bamgbala, 1999).

The doctors write the prescription for healthcare delivery (Rochon and Gurwitz, 1998) and they have the liberty to prescribe various types of drugs that are required. The selections of drugs by the prescribers that are most beneficial to the patients replicate their professional skills in the healthcare system (Crockett, 2005). Studying prescribing patterns is a measure of medical assessment through which prescribing habits can be monitored and may be altered if required so as to promote rational and cost effective use of drugs (Srishyla et al., 1994). Drug use requires being suitable in terms of safety, efficacy and accessibility at all stages (Duke, 1993). Since all the drugs are potentially hazardous in nature; hence must be used with maximum care.

Antibiotics are most commonly prescribed in most of the developing countries. They are easily available and sold in some places even without prescription and therefore are misused often (Calva and Bojahi, 1996). This may cause an enhanced level of microbial resistance and it has been reported that around 30% of hospitals’ budget is spent on antimicrobial use; almost one half of all hospitalized patients are prescribed an antibiotic (Vlahovic-Palcevski et al., 2005). Appropriate drug use has shown an enormous impact towards worldwide drops in morbidity and mortality with its succeeding gains (Tefarra et al., 2002). Upgrading antibiotic prescribing to decrease microbial resistance and regulate medical budgets is a budding precedence, although the procedure to achieve this is not well-defined. Globally, the overuse of antibiotics is recognized up to much extent.

Unsuitable prescribing practices are found to be related to International medical graduates, prescribers with high- volume work and those who were in practice extensively (Genevieve and Robyn, 2007).

Much of the antibiotics are used for viral or instinctively determining bacterial infections. In a report from The Centers for Disease Control and Prevention (CDC) it was documented that almost 100 million antibiotic courses per year are prescribed by physicians in whom around one-half are needless (Dowell et al., 1998). It was concluded in a study on prescribing patterns of physicians by Fahey et al (1998) that nearly 50% of patients having colds and
upper respiratory tract infections and 80% of patients with acute bronchitis were prescribed antibiotics. Although it was known that antibiotics should not be used to cure viral diseases but such prescribing patterns continued (Fahey et al, 1998).

Improper use of antibiotics is seen in many ways; not only giving it when not indicated but also with wrong frequency, wrong combination hence minimizing efficacy and maximizing unwanted effects (University of Washington, 2000). Therefore, irrational antibiotic prescribing enhances microbial resistance that affects both developing and developed countries. Numerous aspects causative for increase in antibiotic resistance have been recorded in an article by the University of Washington (University of Washington, 2000) that included over use of antibiotics, even in viral infections, partial period of antibiotics use, availability of antibiotics without prescription, poor counseling of patients about antibiotic use and patients purchasing only inexpensive medicines. There is inadequate counseling of patients regarding drug use when drugs are dispensed by persons other than pharmacy personnel and patients could not be highlighted to follow and complete the course of antibiotics. Another issue that may cause antibiotic resistance is prescribing a single agent when a combination is necessary to cure some infections. This may happen if the drugs are not cost effective for the patients or if the prescribers are not meeting continuous medical education regarding certain conditions and their treatment (University of Washington, 2000). It is a new para so line spacing should be proper from the previous para due to expensive and new medicines is seen worldwide (Chetley, 1993) including a developing country like Pakistan. The prescribers write newer and costly medicines to the patients even if they are not better than the conventional ones and even they prescribe some unnecessarily (Jones et al., 1996). Inclination of many consultants is seen towards prescribing the newest, the more costly and greatly sponsored drugs as principal treatment (Jones et al., 1996). Despite of the presence of better, conventional and cost effective drugs. It should be noted that around 30% Pakistani population is living under poverty line (The Daily Jang Quetta, 1999). Both the prescribers and consumers are required to be educated regarding cost-benefit notion of medicines.

The custom of large computerized databases that permit connection of drug use data to diagnosis is contributing to the study of drug utilization, despite of some characteristic restrictions. Prominence of drug use studies in pharmaco-epidemiology has been cumulative due to their close link to further capacities like public health, pharmaco-economics etc. The
present study was conducted with primary objective to evaluate the prescribing patterns of physicians in for antibiotics in public healthcare segment in Karachi, Pakistan. The estimation of drug utilization is essential for medical, informative and monetary purposes (Upppal et al., 1984).

**Methodology**

In this descriptive study, the data regarding antibiotics prescribing patterns was collected with convenience sampling method from May to August 2014. Patients’ medication records were studied and data was collected from three different wards (Pediatrics, Cardiology and female Medicine) of Civil hospital, Karachi, Pakistan. The collected data was then analyzed for assessment of use of antibiotics in these wards.

**RESULTS AND DISCUSSION**

Drug utilization studies are important tools for measuring prescribing hitches in healthcare facilities, identifying zones for improving drug recommending practices (Bharity et al., 2008). The policy makers, healthcare professionals and the public claim facts and figure on quality of healthcare provision (Pont et al., 2004). Principles of standard treatment guidelines should be followed and evaluation of the quality of care should be part of routine clinical activities (Patterson, 1986).

In our study, three different wards (Pediatrics, Cardiology and female Medicine wards) of the hospital were visited to determine the prescribing patterns of physicians as their irrational use gives rise to a number of hitches to both the prescribers and the consumers. The gender distribution in the wards is shown in “Fig. 1”.

![Figure 1: Gender distribution percentages in different wards](image)
Unhindered access and inappropriate use of drugs is very common in many developing states (Siddiqui et al., 2002). Children and Infants signify a big part of the inhabitants in the developing nations (Dubey et al., 2006). It has been documented in many studies that hospitalized children are prescribed antibiotics in irrational manner (Moreland et al., 1978). The most common ailments due to which most of the children visited hospitals for treatment were acute respiratory tract infection, gastrointestinal infections and viral fever as reported by Bharathiraja and co workers (2005) (Bharathiraja et al., 2005). Lower respiratory tract infections were reported to be the primary cause of mortality in children younger than 5 years of age (Ghai et al., 2009). In our study also, the patients in Pediatrics ward were mainly suffering from respiratory tract infections; and also from TB, chronic liver disease, gastritis, typhoid, fungal infections and sepsis for which the most commonly prescribed antibiotics were ceftriaxone (59.25%), Amikacin (33.33%) and Metronidazole (24.07%).

In Cardiology ward, patients were mostly having hypertension, hypertension + diabetes mellitus and cardiovascular diseases/ angina for which Ceftriaxone and Amoxicillin clavulanate were the most commonly prescribed drugs (64.70% and 19.60% respectively). In Cardiology ward, patients received antibiotics less regularly than patients in other wards, which is perhaps due to the non-infectious reason of their hospitalization. It is more possible that elder patients hospitalized in the cardiology ward might suffer from certain prolonged non-communicable ailments like diabetes mellitus and hypertension (Ashworth et al., 2006). Prospective suitable antibiotic use in the ageing population is a serious task if characteristic indicators of infections may be lacking in such patients (Rodriguez-Julbe et al., 2004). In our study nonexistence of co-morbidities calculates reduced use of a right antibiotic. Likewise, hospitalization due to non- infectious causes may be prolonged and increases the possibility of getting various antibiotics. In female medicine ward, most common cases found were of respiratory tract infections, TB, chronic liver disease, diabetic foot and pleural effusion for which Amoxicillin clavulanate and Ceftriaxone (26.76% and 16.90% respectively) were prescribed. This is similar to the findings of Meher et al in which it has been reported that mostly Respiratory tract infections (24%) were indicative for the use of antibiotics like ceftriaxone (30.03%) and co-amoxiclav (22.6%) (Meher, 2014).

It is indicated from our study that antibiotics are the most commonly prescribed medicines in all the wards; prescribing the correct antibiotic with correct dose, correct route of administration and correct combination drugs is very necessary to obtain the required
outcomes from the therapy. It is seen from a previous study that some doctors prescribe larger numbers of certain antibiotics and parenterals when they have a monetary enticement (Trap and Hansen, 2002b). Warranting sensible prescribing is the foremost challenge for the healthcare providers and antibiotics-related complications are a main safety concern for hospitalized patients.

From “Fig. 2” it can be seen that ceftriaxone has been prescribed mostly to the patients especially belonging to age of 6 months to 12 years and in the age group of 30 -80 years, for the treatment of different diseases and infections. These results were in conformance with another study from which it was found that use of third generation cephalosporins, especially ceftriaxone and cefixime, were in current practice for Pediatrics in tertiary health care facilities in Karachi, Pakistan (Meher, 2014).

![Antibiotics v/s Percentages in various wards](image)

**Figure 2: Antibiotics v/s Percentages in various wards**

Overall use of various antibiotics in different wards according to different age groups of patients is illustrated in “Fig. 2” which shows that the most commonly used antibiotic was ceftriaxone and vancomycin in the age group 6 month to one year. It is also depicted from “Fig. 3” that the most commonly used antibiotic in all the wards was ceftriaxone (55%). Physicians usually prescribe antibiotics to the patients as a therapy with swift outcome so as to keep patients’ confidence (Wilkowske, 1991) and antibiotics like Ceftriaxone that offer wider empiric antimicrobial treatment are prescribed usually without laboratory investigations (Wilkowske, 1991).
Figure 3: Most common antibiotics used in various wards.

Polypharmacy/drug misuse was found in more or less all the wards in our study and 24.07% cases of overuse/polypharmacy were identified in Pediatrics ward as shown in “Fig. 4” which is quite higher than that reported from Rawalpindi/Islamabad, Pakistan (2.97) (Najmi et al., 1997), South Africa (2.6) (Karim et al., 1996) and Bangladesh (1.44) (World Health Organization, 1993). Polypharmacy itself is documented to be a causal issue for hospitalizations so it should be avoided (Najmi et al., 1998) and requires some interventions critically to recover the situation (Rehan and Pal, 2002).

Figure 4: Polypharmacy/drug misuse in different wards
It has been observed that antibiotics are prescribed incorrectly by those doctors with high-volume practices or who were in practice for long (Genevieve and Robyn, 2007). Interventions regarding polypharmacy, drug labeling and access to an essential drugs list are crucial for promoting rational use of drugs (Karande et al., 2005). An instructive intervention with an antibiotic guide was found operational in reducing non-adherent antibiotic treatments (Johanne et al., 2007). Replication of interventions consistently may be needed to sustain its efficiency along with policies regarding continuous education for healthcare professionals (Sumant et al., 2008).

CONCLUSION
Polypharmacy itself is regarded as a causal feature for hospitalizations so it should be circumvented. Irrational use of antibiotics may be due to some healthcare providers’ seeming demand and there is a serious requirement for some intercessions to recover the condition. Cognizance of the rational use of antibiotics is obligatory, chiefly intended at decreasing the general prescribing of antibiotics. The current institutional setups should be supported to safeguard patients, improve and establish a suitable regulatory agenda and reinforce the public health care provision.

Study Limitations
This study covers the cases from few wards of a single hospital in Karachi, Pakistan. The study can be stretched to maximum wards and other hospitals of Karachi, also to collect information on the existing prescribing practices and drug use.

Conflict Of Interest
There is no conflict of interest.

REFERENCES


