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AN AUDIT OF PRESCRIPTION FOR ANTIBIOTIC IN A TERTIARY CARE HOSPITAL IN KOLKATA, INDIA

Anjan Adhikari[1], Shailendra Singh[2], Sharmistha Biswas [3], Tarit Bhowal [4], Kanchan Kumar Mondal[5], Anup Kumar Das [6] and Susanta Kumar Bandyopadhyay [7]

ABSTRACT: Antibiotics are most commonly prescribed drugs in tertiary care hospitals; more than 30% of the hospitalised patients were treated with antibiotics. Rational use of antibiotics is very important to ensure the optimum treatment outcomes and to limit the emergence of bacterial resistance. Present study is a hospital based cross-sectional study carried out for a period of three months in different clinical departments of a tertiary care hospital to find out the antibiotics prescribing pattern. Out of total 551 evaluated prescriptions, an antibiotic was prescribed in 45.5% cases. The most commonly prescribed antibiotics were Moxifloxacin 19.5%, Metronidazole 10.4% and Amoxicillin+Cloxacillin 10.2%, broad spectrum antibiotics usage was higher & 87.7% of the antibiotics were prescribed by brand names. The appropriate use of antibiotic is a greatest need of the current situation all over the world. The rising antibiotic resistance is a global problem which is directly related with the irrational prescription of antibiotics.

Key words: Antibiotics, Tertiary care hospital, Rational drug use.

INTRODUCTION

Infectious diseases are responsible for increased rate of mortality, it represents one fifth of the total global deaths (World Health Report 2012). Antibiotics are one of the important component of modern medicine,

[1] *Associate Professor and Coordinator, ADR monitoring centre, Department of Pharmacology, R.G. Kar Medical College & Hospital, Kolkata, West Bengal, India.*

[2] *Research Fellow, Institute of Clinical Research India (Cranfield University), New Delhi, India.*

[3] *Associate Professor, Department of Anatomy, N.R.S Medical College, Kolkata, West Bengal, India.*

[4] *Research Fellow, Department of Pharmacology, R G Kar Medical College & Hospital, Kolkata,West Bengal, India.*

[5] *Associate Professor, Department of Ophthalmology, R.G Kar Medical College & Hospital, Kolkata, West Bengal, India.*

[6] *Professor & Head, Department of Pharmacology, R G Kar Medical College & Hospital, Kolkata,West Bengal, India.*

[7] *Director of Medical Education & E.O. Secretary, Department of Health & Family Welfare, Govt. of West Bengal, Swasthya Bhavan, Kolkata, India.*

plays a vital role in both treatment and prophylaxis of infectious diseases (Abula and Kadir 2004, WHO 2002).

Pathogenic bacteria are becoming resistance to antibiotics at frightening rate due to irrational and improper use of antibiotic (ISNA 2006). Excessive and uncontrolled use of antibiotics created resistance in microbes which cause serious health hazards to human beings (WHO 2008). World Health Organization (WHO) considered antibiotic abuse & development of resistance as a serious international concern and recognised antibiotic use as a priority in their rational drug use campaign (WHO 2001, Abula and Kadir 2004).

Antibiotics are most commonly prescribed drugs in tertiary care hospitals, more than 30% of the hospitalised patient were treated with antibiotics (Shankar *et al.* 2003). Medically ineffective, improper, and economically distressing, use of antibiotics is observed all over the world in healthcare system, responsible for development of antibiotic-resistance (Laura and Lucieni 2004). Rational use of antibiotics is very important to ensure the optimum treatment outcomes (Shankar *et al.* 2003). Several authors have reported about the expensive, indiscriminate and excessive use of antibiotics that results in antibiotic resistance (Kollef 2001, Niederman 2003, Pulcine *et al.* 2006).

Increased antibiotic-resistance compelled researchers to develop new antibiotics to fight against pathogens. One single research for development of new antibiotic can cost US $500 million dollars and will take 10-20 years (Sharma *et al.* 2005).

This is the main reason for need of more research. Monitoring of antibiotic use in the prescription in a teaching hospital in Kolkata will evaluate the status of antibiotic use. Strategies can be developed, depending on the prescription pattern, to achieve rationality in terms of antibiotic, which ultimately help the beneficiaries.

MATERIALS AND METHODS

This is a hospital based observational, cross-sectional study carried out for a period of three months from June to August 2012, in different outpatient department of R.G. Kar Medical College & Hospital, tertiary care hospital in

Table 1: Distribution of study population according to age (n=551).

Age group (Years)	Number	Percentage
<12	67	12.2
12-20	52	9.4
21-30	89	16.2
31-40	112	20.3
41-50	114	20.7
51-60	73	13.3
>60	44	7.9
Total	**551**	**100**

Kolkata. The study was cleared from the Institutional Ethical Committee. The participants enrolled randomly in the study, involved patient attending the out-patient department. The participants enrolled in the present study only after taking their written informed consent. Permission of the guardian was taken in case of minors. Photocopy of the prescription was collected for audit & an interview was also conducted. The collected samples were screened for legibility. Only the legible prescriptions were evaluated for antibiotic prescription pattern.

RESULTS AND DISCUSSION

A total of 700 patients were included in this study .Out of total 700 collected prescriptions 149 were illegible so only 551 were selected for evaluation. Among the total 551 patients whose prescriptions were selected 40.7% were male while 59.3% were female. The mean for the patient age was 36.5 while median and mode were 37 and 40 respectively. The age distributions of the selected patients were given in table 1.

It was found that out of total 551 audited prescriptions an antibiotic was found in 245 prescriptions *i.e* 44.5% of the cases. In present study antibiotics accounts for 23.3% of the total 1432 prescribed drugs in 551 prescriptions and the number of antibiotics per prescription was 0.6 while number of drug per prescription were 2.6.

Several antibiotics had been prescribed to the patients, but the most commonly used antibiotics were Moxifloxacin 19.5% (65), Metronidazole 10.4% (35), Amoxicillin+Cloxacillin 10.2% (34), Ciprofloxacin 6% (20) followed by the other antibiotics. The most common class of antibiotic were quinolones 28.25% (94) followed by Penicillin's 17.4% (58) and Antifungal 15.3% (51). Other antibiotics includes Cefpodoxime, Hydroxy-chloroquine, Azithromycine, Ofloxacin+Ornidazole, Terbinafine, Nitrazoxanide+Ofloxacin, Cefadroxil, Gentamicin, Sulphamethoxazole+ Trimethoprim, Erythromycin etc.(Fig.1).

The use of antibiotics in a tertiary care hospital for both the treatment and prophylaxis of a disease is a justifiable practice however it requires regular review of the chosen antibiotics. Present study revealed that out of total 551 audited prescriptions an antibiotic was found in 245 prescriptions i.e 44.5% of the cases. The data's are similar with other studies

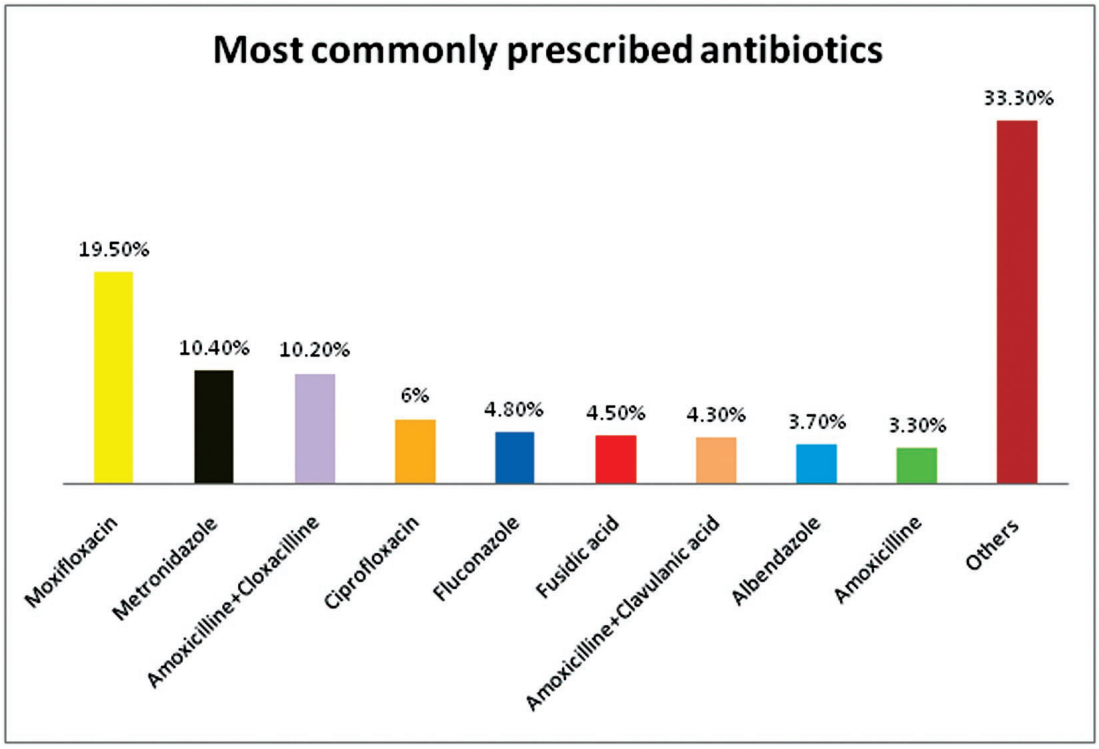
Table 2: Assessment of some drug related parameters (n= 551).

Sl No	Parameter	Events
1	Total numer of drugs prescribed	1432
2	Total numer of antibiotic prescribed	333
3	Percentage of antibiotic prescribed	23.3%
4	Number of antibiotics per prescription	0.6
5	Total numer of other drugs prescribed	1099
6	Percentage of other drugs prescribed	76.7%
7	Number of drug per prescription	2.6

conducted in other parts of India. A study in Karnataka evaluated that, 37.7% of the prescriptions contained antibiotics (Ganguly *et al.* 2005, Abula and Kedir 2004, Tunger *et al.* 2009).

In present study antibiotics accounts for

Fig. 1: Categories of most commonly prescribed antibiotic (n= 333).

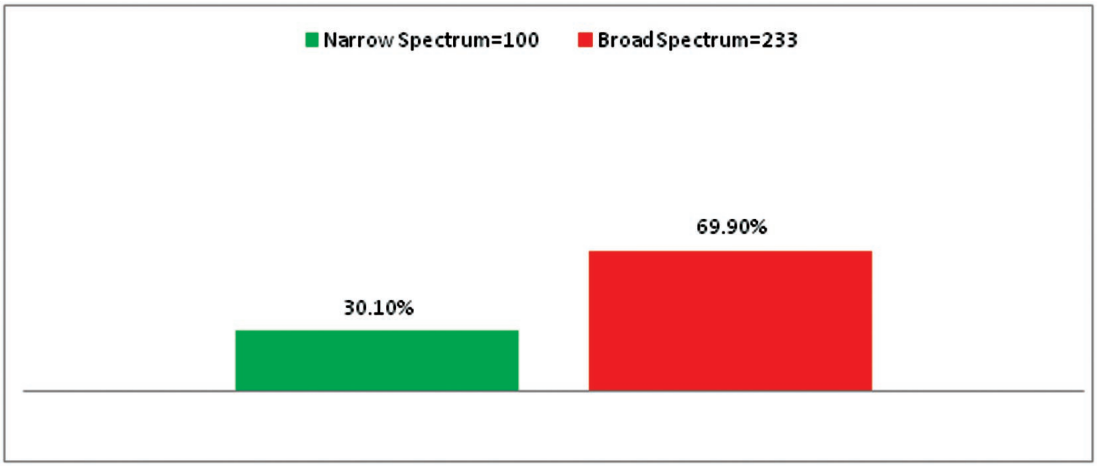


69.9% of the total prescribed antibiotics where of broad spectrum (Fig. 2) and 87.7% of the antibiotics were most commonly prescribed by their brand name (Fig.3).

and Arora 2011). Another study in New Delhi shows that out of 17995, 9205 and 5922 patient visiting retail pharmacy, public facilities and private clinic 39-43% of the patient were prescribed an antibiotic (Kotwani and Holloway 2011). International studies in Turkey, Northeast Ethopia and in Europe, it was seen that an antibiotics was present in 37%, 42% and 23% of the respective cases (Goosens 23.3% of the total 1432 prescribed drugs in 551 prescriptions, number of antibiotics per prescription was 0.6 which is lower than those in other reports (Crosseley 1984).

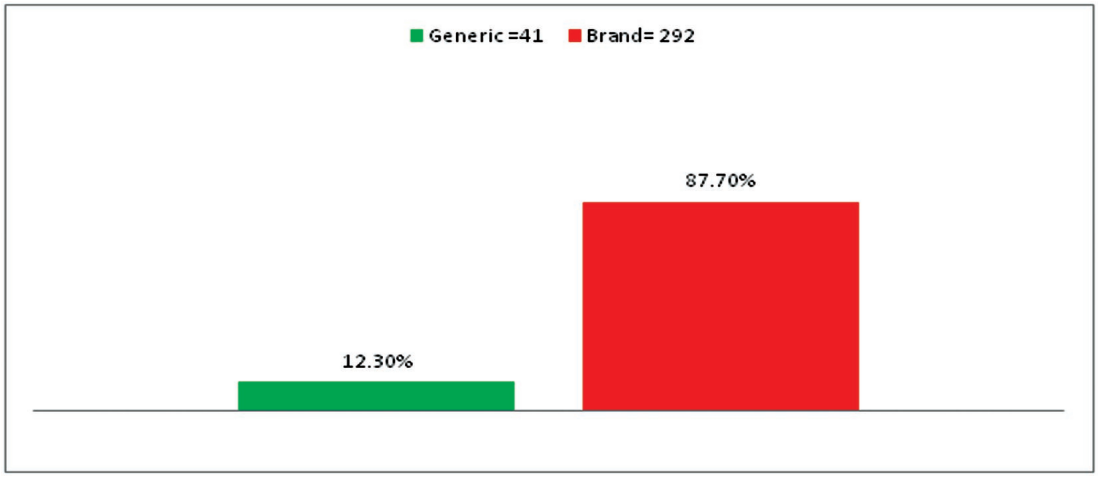
In the present study it has been demonstrated that Moxifloxacin (19.5%), Metronidazole (10.4%), Amoxicillin+Cloxacillin (10.2%), Ciprofloxacin (6%), Fluconazole (4.8%) and

Fig. 2: Pattern of antibiotic prescription according to the spectrum of activity (n=333).



The present findings revealed that in 33.1% of the prescription audited, dose was missing while frequency and duration was not mentioned in 14% and 22% of the cases. It was also found that diagnosis, any one of the findings and history of the disease were not mentioned in 58.8% of the cases.

Fig. 3: Analysis of antibiotic prescribed by generic names (n=333).



Interview of the patients with predesigned & pretested questionnaire revealed that, 23.4% of the patients were using self-medication of antibiotics for common ailments like fever, cough etc. 53.1% of the patient were unable to understand the instruction by doctors and 58.7% of them don't understand the dosing schedule while 43.2% forget to take it as per instructed schedule. 23.7% of the patient answered that they did not complete their course of medication prescribed by their doctors.

Fusidic acid (4.5%), were the most commonly prescribed antibiotic in all the OPD of R. G. Kar Medical College followed by Amoxicillin+Clavulanic Acid (4.3%), Albendazole (3.7%) and Amoxicillin (3.3%) and some other antibiotics. Other antibiotics include Cefpodoxime, Hydroxy-chloroquine, Azithromycin, Ofloxacin+Ornidazole, Terbinafine, Nitrazoxanide+Ofloxacin, Cefadroxil, Gentamicin, Sulphamethoxazole+ Trimethoprim, Erythromycin etc. The most common class of antibiotic in this study were quinolones (28.25%) followed by Penicillin's (17.4%) and Antifungal 15.3%. A study in Karnataka, India showed that quinolones and nitroimidazoles were the most frequently prescribed antibiotics followed by amino-penicillin combinations (Ganguly and Arora 2011). A similar study in Panjab, India conducted in a hospital showed that antibiotics, Amoxicillin (18.04%), Ciprofloxacin (15.9%), Ofloxacin (14.7%) and Erythromycin (11.5%) (Takhar *et al.* 2011) were commonly prescribed.

However a survey conducted by National Hospital Ambulatory care in USA during eight year period (1992-2000) it was seen that penicillins, tetracyclines, sulphonamides, azithromycin, clarithromycin and quinolones were the most frequently prescribed antibiotics (McCoig *et al.* 2003). Study in northwest Ethiopia, the antibiotic usage in the in-patient department of a teaching hospital for a period of three months showed that Ampicillin was the most commonly prescribed drugs for prophylaxis and treatment (Abula and Kedir 2004). Study in Turkey indicates that more than one third of the hospitalized patents were received antibiotics. β-lactam, quinolones and third generation cephalosporins were most frequently prescribed drugs in hospitals of Turkey (Tunger *et al.* 2009).

In this study it was found that prevalence of broad spectrum antibiotic (69.9%) is higher than the narrow spectrum antibiotic (30.1%). Except some countries like Sweden, Norway and Denmark, the data's are very similar in all over the world (Crosseley 1984, Durbin *et al.* 1981, Topno 2012) including India, increased use of broad spectrum antibiotics has been reported in various studies. This is contrary to the rational use of antibiotics. 3rd generation Cephalosporins were used mostly (Ganguly and Arora 2011, Kotwani and Holloway 2011) in hospital just because of their broader spectrum of activity. 3rd generation Cephalosporins must be used cautiously in OPD of a tertiary care hospital as it's over or under use leads to irrationality.

In the present study it was found that 87.7% of the antibiotics were prescribed by brand name while only 12.3% were prescribed by generic names which is very similar to a study conducted in a tertiary care hospital in Pondicherry, India which indicates that 11.96% dugs were prescribed by generic name while 88.04% were prescribed by brand name (Isabella *et al.* 2012). Similar study conducted in Madhya Pradesh (India), showed that 45% of the drugs were prescribed by the generic name (Bhartiy *et al.* 2008). International studies reported by Yasmeen *et al.*(2011) showed similar results.

Evaluation of prescription in the present study revealed that, diagnosis, findings and history of the disease were not mentioned in 58.8% of the cases. It was also observed that in 33.1% of the cases dose was missing while

frequency and duration was not mentioned in 4% and 22% of the cases. The condition is very much same in the other part of the country, like Pondicherry, India showed that dose was not mentioned in 8% of the cases while duration was not mentioned in 25.5% and frequency in 9.5% cases (Isabella *et al.* 2012).

CONCLUSION

The appropriate use of antibiotic is a greatest need of the current situation all over the world. The rising antibiotic resistance is a global problem which is directly related with the improper use of antibiotics. This study has shown that antibiotic is widely prescribed in all the department of the tertiary care hospital of study. Majority of the antibiotics were prescribed by the brand name which may increase the healthcare cost. In majority prescription, indication for antibiotic use was not mentioned. Present study identified the status of antibiotic prescribing pattern in a tertiary care hospital. Without a proper antibiotic policy, it will never be possible to reduce the irrational use of such important drugs. Regular prescription auditing along with implementation of standard protocol can only improve the situations, especially in third world countries.

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