ORIGINAL RESEARCH PAPER

VOLUME-6 | ISSUE-7 | JULY-2017 | ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 78.46

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

ANTIBIOTIC PRESCRIBING PATTERN IN-PATIENT PAEDIATRICS DEPARTMENT IN A TERTIARY CARE HOSPITAL OF EASTERN INDIA

Pharmacology

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ABSTRACT

OBJECTIVE: to find out the extent of antimicrobial use in different indication in the paediatric in-patient department of a tertiary care hospital. **METHOD:** After ethical approval, a prospective, cross-sectional, descriptive epidemiological study was commence in October, 2012 - December, 2012 in the paediatric inpatient ward of Burdwan medical college and hospital. All inpatient case records were examined and there was no patient contact in any form. Patient particulars including provisional diagnosis, investigations done and drug data was recorded on a customized data collection sheet. Basic drug indicators were selected to analyze the prescribing patterns. **RESULT:** In the present study, average number of drugs prescribed was 3.21; 24.39% of the medicines were prescribed by generic names. A fair number of drugs (96.58%) were prescribed from the NLEM-2011. This showed that rational drug use in respect to these indicators. In present study 67.60% injection were used. More than 60% drugs were supplied from hospital. In current study, in 95% of prescription antimicrobial drugs were prescribed. On average 1.68 AMBs were prescribed per prescription per day, indicating irrationally high antimicrobial use. Most of the infective disease was treated according to standard treatment guidelines. AMBs were prescribed on clinical judgments in majority of the patients rather than taking the specimen for culture. **CONCLUTION:** The results of this study have provided strong evidence for the irrational high use of antibiotics and injection, which lead to increase treatment cost.

KEYWORDS:

INTRODUCTION

Infants and children are among the most vulnerable population groups to contract illnesses. The use of antimicrobial agents, especially antibiotics has become a routine practice for the treatment of paediatric illnesses [1,2]. The ultimate goal is to achieve rational and cost effective medical care, particularly in the economically developing countries.

Infancy and childhood is a period of rapid growth and development. Compared to adult medicine, drug use in paediatrics is not extensively researched and the range of licensed drugs in appropriate dosage form is limited. Drug therapy is considered to be major component of paediatrics management in health care setting like hospital. Effective medical treatment of paediatric patient is based upon an accurate diagnosis and optimum course of therapy, which usually involves a medication regimen.

Children constitute about 40% of India's population. Infants and children suffer from frequent but usually non serious illnesses. Most of these are self-limiting [3] and are often treated not only inappropriately, but also resorting to polypharmacy[4].

The key role of antibiotics for the treatment of infectious diseases that are prevalent everywhere in developing countries may not be denied. However, there are also reports of an irrational use of antibiotics (5) (6) which may even lead to infections that are worse than the originally diagnosed ones.

The present study was conducted with the objective to find out the extent of antimicrobial use in different indication in the paediatric in-patient department of a tertiary care hospital.

MATERIALS AND METHODOLOGY

This cross-sectional, descriptive study was conducted in the paediatrics in-patient department of Burdwan Medical College and Hospital. Burdwan Medical College and Hospital is a tertiary care centre situated in Burdwan district, one of the largest districts of the state West Bengal. Data were collected on three days of every week during October, 2012 - December, 2012. Study population comprised of patients who were admitted in paediatrics in-patient due to infective cause of illnesses like respiratory tract infection, CNS infection, septicaemia, acute gastroenteritis, as well as seizure, prematurity like non-infective illness. Thus, all the patients admitted on the data collection period were covered and it came to 500 by complete enumeration method. Patient related information (age, sex, diagnosis) and drug-related information (drugs, dose, dosage form, route of administration) were collected in a pre-designed, structured schedule in accordance with WHO criteria for Drug Utilisation Survey and Research [7]. Indoor ticket, treatment sheets, case records of patients, doctors' prescription and notes were other study tools. Study technique was being record review. The study was approved by Institutional Ethics Committee (IEC) of the institute. Data were collected only after having informed verbal consent from the patient or legal guardian (when patient is not able to give consent) after explaining the purpose of the study and the confidentiality of the documents.

Statistical analysis: Collected data were compiled in Microsoft Excel worksheets (Microsoft, Redwoods, WA, USA). Data were presented both in tabular and graphical form. Categorical data were expressed in percentages and continuous data were expressed in mean values. Standard deviation (SD) was computed to see the dispersion of data.

Result and analysis

Out of 500 prescriptions most common age group in the study population was between 1 yr to 5 yr (34%); followed by age group less than 1 month (27%) and 1month to 1yr (27%). Only 12% was more than 5 yr. This distribution was done according to "American Academy of paediatrics". Distribution of the study population according to sex reviled that there was more Male (62.60%) than Female (37.40%) in the study population (Table 1).Distribution of the study population according to religion revealed that Hindu (69%) were more common than Muslim (31%) in the study population. (Table 1).Distribution of the study population according to body weight revealed that 46.80% study population was up to 6 kg; followed by weight group of 6-12 kg (31.20%), 12-18 kg (16.40%)(Table 1).

Table 1: WHO recommended Prescribing Indicators **N = 500**

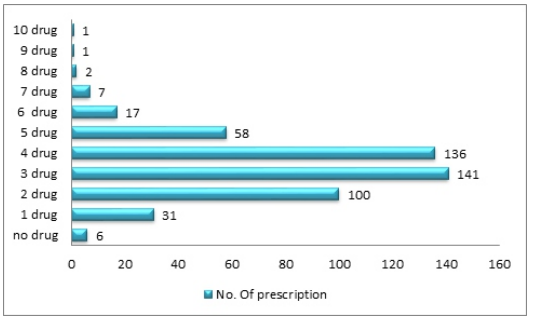
Average number of drugs prescribed per day	**3.21**
Percentage of the drugs prescribed by generic name	24.39%
Percentage of the drugs prescribed from essential drug list	96.58%
Percentage of the drugs supplied from hospital pharmacy	65.71%
Percentage of inject able drugs prescribed per day	67.60%
Percentage of prescription containing antimicrobial agent	94%

Table 2: Distribution of different group of antimicrobial. **N=838**

Group of antimicrobial	No	%
Penicillin group	122	14.56
Cephalosporin group	385	45.94
Aminoglycoside	276	32.94

Others	55	6.56
Drug	**No**	**%**
Penicillin	1	0.82
Ampicillin	19	15.57
Amoxicillin	15	12.30
Amoxicillin+clavulanic acid	77	63.11
Piperacillin + tazobactam	10	8.20
Cephalosporins	**No**	**%**
Ceftriaxone	140	36.36
Ceftriaxone + Sulbactam	30	7.79
Ceftriaxone + Tazobactam	18	4.68
Cefotaxim	122	31.69
Cefepime	49	12.73
Cefpodoxim	5	1.30
Cefoperazone + Sulbactam	10	2.60
Ceftazidime	11	2.85
Aminoglycoside	**No**	**%**
Amikacin	117	42.39
Gentamycin	126	45.65
Niltimycin	32	11.59
Tobramycin	1	0.37

Figure 1: Bar diagram showing Distribution of prescription according to number of drug prescribed



DISCUSSION

WHO defines rational use of drugs when "patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community" [8]. The irrational use of drugs is known to lead to an increase in the cost of treatment, incidence of ADR and development of resistance against antimicrobials [9]. There is enough evidence to demonstrate that prescribing of drugs has shifted from generics to branded and prescribing out of NLEM [10,11,12].

The results of studies help policy makers to develop policy regarding quality of rational drug use in a health facility [13, 14, 15]. A meticulous perusal of the literature reveals that paediatric population faces improper use of medicines and subsequent [10, 11, 12] ADR events. Since paediatric patients are more sensitive toward drugs and ADR. Irrational use of drug can't be tolerated in this age group of population. For that reason drug utilization study on continuous bases must be performed to expose and eliminate such events as much as possible. The present piece of study was started with the aim to find out the prescribing pattern in a paediatric inpatient setting and is an ongoing study.

The study showed that antibiotic prescribing practice was high (94% of prescription) compared with those studies in Katmandu, Bajracharya et al. 17.2% [26]. Haute Goronne in France, Benjamin et.al.15.6% [29] and Cameroon Volk et al. 48.9% [27], JUSH in 2002 42.6% and it was only comparable with a study in Chennai in India 79.4% which was conducted by Delhi society for promotion of drug use concepts and perspectives [30]. The high prevalence of antibiotic use in this study was due to high prevalence of sever, serious infectious disease such as LRTI, sepsis, CNS infection. Empirical treatment of different sever infectious diseases with more than one antimicrobial due to very few culture sensitivity test performed was another cause of higher antimicrobial use. So, for rapid control of the infection antibiotic coverage of all possible bacterial infection was done. If such high antibiotic usage is continued, resistance might be developed that would end up in treatment failure. As high as 92.4 percent of prescriptions were contain at least two drugs. Three drug containing prescription was most common 28.2%,followed by four drug containing (27.2%) and two drug containing (20%) prescription which was similar to the study done in Moradabad [31] . As high as 94 percent prescription contain at least one antimicrobial agent. In most of prescription two AMB prescribed (48.4%) followed by one AMB (34.2%). Prescription without AMB was 6%. Similar study done in Moradabad [31] shows majority of the patients (about 72%) was prescribed with at least one antibiotic. The multiple antibiotics were found in 129 (57.84%) prescriptions whereas the single antibiotic was prescribed in only 32 (14.35%) prescriptions. Three antibiotics were observed in 213 (31.84%) prescriptions. Among different class of antimicrobial agents Cephalosporin (45.94%) was commonly used group of antimicrobial followed by Aminoglycoside (32.94%) and Penicillin (14.56%) which was comparable to Moradabad city study [31]. This shows that irrespective to the study setting antimicrobial use pattern was similar. Among different penicillin Amoxicillin+Clavulanic acid (63.11%) most commonly used followed by Ampicillin (15.57%) and Amoxicillin (12.30%) which was similar to the study of Moradabad [31]. Ceftriaxone (36.36%) and Cefotaxim(31.69%) commonly used cephalosporine,followed by 4th generation Cephalosporine, Cefepime (12.73%) which goes with the study of Agalu and Mekonnen [37]. Gentamycin (45.65%) and Amikacin (42.39%) commonly used Aminoglycoside. Overall most commonly used AMB was Ceftriaxone which prescribe in 140 out of 500 prescription with percentage usage 28, followed by Gentamycin (percentage of usage 25.2), Cefotaxim (percentage of usage 24.4),Amikacin (percentage of usage 23.4) . This frequency was different than previous studies due to difference in study setting, causative organism, AMB sensitivity of causative organism, pharmacy supplied AMBs. Aminoglycoside and Cephalosporine combination was most commonly used systemic antimicrobial combination. Cefotaxim and Amikacin commonly used combination in sepsis and birth asphexia & sequel,where age distribution mostly neonatal (less than 28 days). Gentamycine and Ceftriaxone most common used systemic antimicrobial combination over all study. Amoxicillin+ clavulanic acid and Aminoglycoide was the other combination ,which was used in LRTI . In the study of Moradabad city [31] commonly used AMB combination was Ceftriaxone + Vancomycin followed by Cefpodoxime + Amikacin. This was probably due to different distribution of disease and different antimicrobial sensitivity of causative organism.

CONCLUTION

On comparison with results available in literature, it was found that the antimicrobial use in the present study was irrationally high. Most of the infective disease was treated according to standard treatment guidelines. So, the irrationality was due to prophylactic AMB use in non infective conditions to prevent hospital acquired infection and AMBs were prescribed on clinical judgments in majority (96.58%) of the patients rather than taking the specimen for culture. The results of this study have provided strong evidence for the irrational use of antibiotics and injection, which lead to increase treatment cost. This cost burden mostly taken up by the government, who is the representative of whole community.

References

1. Sanz EJ, Bergman U, Dahlstorm M. Paediatric drug prescribing. Eur J Clin Pharmacol. 1989; 37: p. 65-8.
2. Summers RS, Summers B. Drug prescribing in paediatrics. Ann Trop paediatr. 1986; 6: p. 129-33.
3. Straand J, Rokstad K, Heggedal U. Drug prescribing. Acta Pediatrica. 1998;(87): p. 218-24.
4. Ghai OP, Paul VK. Rational drug therapy in pediatric practice. Indian Pediatr. 1988; 25: p. 1095-109.
5. Principi N. Control of antibiotic therapy in paediatric patients. Developmental pharmacology and therapeutics. 1981; 2: p. 145-55.
6. Schollenberg E, Albritton WL. Antibiotic misuse in a paediatric teaching hospital. Can Med Assoc J. 1980;122: p. 49-52.
7. WHO Expert Commitee. The Selection of Essential Drugs, technical Report Series no.615. 1977. Geneva: World Health Organization.
8. Department Of Health And Family Welfare, Government Of West Bengal. Standard Treatment Guideline For Primary health Care Facilities. 2nd ed. Kolkata; 2011.
9. World Health Organization. Recommendations for management of common childhood conditions Switzerland; 2012.
10. Rational use of medicine. World Health Organisation site. [Online]. [cited 2011 Dec 2]. Available from: http://www.who.int/medicines/areas/ rational_use/en/.
11. Cheraghali AM, Idries AM. Availability, affordability, and prescribing pattern of medicines in Sudan. Pharm World Sci. 2009; 31(2): p. 209-15.
12. Drug utilization. (IUPHAR). [Online]. [cited 2011 Dec 2]. Available from: http://www.iuphar.org/pdf/hum_76.pdf.
13. Adebayo ET, Hussain NA. Pattern of prescription drug use in Nigerian army Hospitals. Ann Afr Med. 2010; 9(3): p. 152-8.
14. Jhaj R, Bhargava VK, Uppal R, Reeta K, Saha L, Kaur N, et al. Drug prescribing in children in a North Indian referral hospital. Pharmacoepidemiol Drug Saf. 2000; 9(5): p. 423-7.

15. Bimo H, Hogerzeil V. How to Investigate Drug Use in Health Facilities- Selective Drug Use Indicator. In WHO Department of Essential Drug and Medicine policy 1999. p. 3.
16. Dimri S, Tiwari P, Basu S, Parmar VR. Drug use pattern in children at a teaching hospital. Indian Pediatr. 2009; 46(2): p. 165-7.
17. Khaled A, Sami M, Majed I, Mostafa A. Antibiotic prescribing ina paediatric emergency setting in central Saudi Arabia. Saudi medical J. 2011; 32(2): p. 197-8.
18. Crooks J, Weir RD, Coull DC, McNab JW, Calder G, Barnett JW. Evaluation of a method of prescribing drugs in hospital and a new method of recording their administration. Lancet. 1967; 1: p. 668-71.
19. Summers RS. Drug utilization in internal medicine wards at a teaching hospital serving a developing community. S Afr Med J 1985;67:C. 1985; 67: p. 549-52.
20. Bergman U, Norlin A, Wihokm BE. Inadequacies in hospital drug handling Acta Med Scand. Acta Med Scand. 1979; 205: p. 79-85.
21. Calvin M, Kunin MD. Rational use of antibiotics. WHO Drug Information. 1990; 4: p. 4-7.
22. Walsh JA, Warren KS. Selective primary health care: An interim strategy for disease control in developing countries. N Eng J Med. 1979; 301: p. 967-74.
23. Grant JP. The state of the world's children 1984 Oxford: United Nations Children Fund and Oxford University Press; 1984.
24. Mohanty BK, Ashwin M, Hasamnis AA. Prescription Pattern in the Department Of Medicine of a Tertiary Care Hospital in South India. JCDR. 2010; 4(1): p. 2047-2051.
25. Adebayo ET, Hussain NA. Pattern of prescription drug use in Nigerian army Hospitals. Ann Afr Med. 2010; 9(3): p. 152-8.
26. Bajracharya S, Narmadahas K, Nagrjan M. A study on drug prescribing pattern in Madurat city. Indian J pharmacol. 2002; 34: p. 361-2.
27. Volk H, Obeni H. Prescribing practice at health center level in south west province of Cameroon with especial reference to drug use indicators. INRUD news. 1994; 4(2): p. 20.
28. Kumari R, Idris MZ, Bhushan V, Khanna A, Agrawal M, Singh SK. Assessment of prescription pattern at the public health facilities of Lucknow district. Indian J Pharmacol. 2008; 40(6): p. 243-7.
29. Benjamin H, Jean-Lovis M, Maryse LM. Adverse drug reaction and off-label drug use in pediatric outpatients in Haute GorreneCounty (southwest France). British J. Clin. Pharmaco. 2002; 5(54): p. 665-70.
30. Delhi society for promotion of drug use concepts and perspectives. November15 2007. Accessed at http:www.despord.org rational.html.
31. Ashraf H, Handa S, Khan NA. Prescribing pattern of drugs in outpatient department of Child care centre in Moradabad city. Int. J. Pharm Scie Res. 2010 August; 3(2): p. 1.
32. Nguyen JK, Fouts MM, Kotabe SE, Lo E. Polypharmacy as a risk factor for adverse drug reactions in paediatric nursing home residents. The American Journal of Paediatric Pharmacotherapy. 2006; 4: p. 36-41.
33. Fulton MM, Allen ER. Polypharmacy in the elderly: a literature review. Journal of the American Academy of Nurse Practitioners. 2005; 17: p. 123-132.
34. Rollason V, Vogt N. Reduction of polypharmacy in the elderly: a systematic review of the role of the pharmacist. Drugs and Aging. 2006; 20: p. 817-832.
35. Koh Y, Fatimah BM, Li SC. Therapy related hospital admission in patients on polypharmacy in Singapore: a pilot study. Pharmacy World and Science. 2003; 25: p. 135-137.
36. Mamun K, Lien CT, Goh-Tan CY, Ang WS. Polypharmacy and inappropriate medication use in Singapore nursing homes. Annals of the Academy of Medicine. 2005; 33: p. 49-52.
37. Agalu A, Mekonnen H. Drug prescribing practice in a pediatrics ward in Ethiopian. Int. Res. J. Pharm. Pharmacol. 2012 June; 2(6): p. 132-6.