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 a 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 and are often treated not only inappropriately, but also resorting to polypharmacy. (3)

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 irrational use of antibiotics (5) 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, septicemia, 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. (4) 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 1 month 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 revealed 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>
<thead>
<tr>
<th>Group of antimicrobial</th>
<th>No</th>
<th>%</th>
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<tbody>
<tr>
<td>Penicillin group</td>
<td>122</td>
<td>14.56</td>
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<tr>
<td>Cephalosporin group</td>
<td>385</td>
<td>45.94</td>
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<tr>
<td>Aminoglycoside</td>
<td>276</td>
<td>32.94</td>
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</tbody>
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Table 2: Distribution of different group of antimicrobial.

Table 1: WHO recommended Prescribing Indicators N=500

<table>
<thead>
<tr>
<th>Average number of drugs prescribed per day</th>
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<tr>
<td>3.21</td>
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<thead>
<tr>
<th>Percentage of the drugs prescribed by generic name</th>
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<td>24.39%</td>
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<tr>
<th>Percentage of the drugs prescribed from essential drug list</th>
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<tr>
<td>96.38%</td>
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<tr>
<th>Percentage of the drugs supplied from hospital pharmacy</th>
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<tr>
<td>65.71%</td>
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<tr>
<th>Percentage of injectable drugs prescribed per day</th>
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<tr>
<td>67.60%</td>
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<th>Percentage of prescription containing antimicrobial agent</th>
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<tr>
<td>94%</td>
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CONCLUSION:
The results of this study have provided strong evidence for the irrational high use of antibiotics and injection, which lead to increase treatment cost.
Others  55  6.56  
Drug  No  %  
Penicillin  1  0.82  
Amoxicillin  19  15.57  
Amoxicillin  15  12.30  
Amoxicillin + clavulanic acid  77  63.11  
Piperacillin + tazobactam  10  8.20  
Cephalosporins  No  %  
Ceftaxoxone  140  36.36  
Ceftaxoxone + Sulbactam  30  7.79  
Ceftaxoxone + Tazobactam  18  4.68  
Cefotaxim  122  31.69  
Cefepime  49  12.73  
Cefpodoxime  5  1.30  
Cefoperazone + Sulbactam  10  2.60  
Cettuzidime  11  2.85  
Aminoglycoside  No  %  
Amikacin  117  42.39  
Gentamycin  126  45.65  
Niltimycin  32  11.39  
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”[1][2]. 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[3]. There is enough evidence to demonstrate that prescribing of drugs has shifted from generics to branded and prescribing out of NLEM[4][5][6].

The present study was aimed to find out the irrational use of medicines and subsequent ADR events. Since inadequate period of time, and at the

The results of studies help policy makers to develop policy regarding rational use of drug in a health facility[7][8][9]. 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 Kathmandu, Bajracharya et al. 17.2% [13] Haute Garonne in France, Benjamin et al.15.6%[14] and Cameroon Volk et al. 48.9%[15]. JUHSH 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[16]. The high prevalence of antibiotic use in this study was due to high prevalence of severe, serious infectious disease such as LRTI, sepsis, CNS infection. Empirical treatment of different severe 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 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[17]. 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 [17] 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 (14.33%) prescriptions. Three antibiotics were observed in 213 (31.84%) prescriptions. Among different class of antimicrobial agents Cephalosporin (45.94%) was commonly used group of antibiotic followed by Aminoglycoside (32.94%) and Penicillin (14.56%) which was comparable to Moradabad city study[17]. 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[17]. 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 [18]. 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 from 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 asphyxia & sequel, where age distribution mostly neonatal (less than 28 days). Gentamycin and Ceftriaxone most common used systemic antimicrobial combination, which was used in LRTI. In the study of Moradabad city 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.

CONCLUSION

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 which can be used to improve 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


