Drug Utilization with Special Reference to Antimicrobials in a Subhealth post in Western Nepal

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Abstract

Introduction	Antibiotics are a group of drugs with the most potential impact on morbidity and mortality in the developing world. Misuse of antibiotics is a crucial factor in the genesis of microbial resistance.
Objectives	The present study was carried out to obtain information on demographic characteristics, morbidity patterns, prescribing patterns, percentage of encounters with an antibiotic prescribed and to calculate the mean ± SD cost of drugs per prescription.
Methods	A retrospective analysis of outpatient records over a five-month period (15.08.2002 to 14.01.2003) was carried out at the Armala sub-health post, Kaski district. Percentage of drugs prescribed from the Essential drug list of Nepal was calculated and the prescribing patterns were analyzed.
Results	1375 patients made 1464 visits to the sub-health post; 732 patients were male. Acute respiratory infections [277 patients (20.14%)] were the most common illness. 2198 drugs were prescribed; 75.6 percent of drugs were prescribed from the Essential drug list of Nepal. A total of 1395 drugs (63.5%) were prescribed by generic name. An antibiotic was prescribed in 877 encounters (59.9%), the common indications being acute respiratory infections, injuries, skin infections and enteric fever. Mean ± SD cost of drugs was 54.2 ± 38.6 Nepalese rupees with antibiotics accounting for 58.1 percent of the cost. Problems were noted in 138 prescriptions (9.4%).
Conclusions	The percentage of drugs prescribed from the Essential drug list should be increased. Use of antibiotics in predominantly viral infections should be discouraged. Further studies are required.
Key words	Antibiotics, Drug utilization, Primary health care, Prescribing patterns

Introduction

Drug utilization has been defined as the marketing, distribution, prescription and use of drugs in society with special emphasis on the resulting medical and social consequences[1]. Antibiotics, along with vaccines, oral rehydration salts and contraceptives are the group of drugs with the most potential impact on preventable mortality in the developing world[2].

Antibiotics are a commonly prescribed group of drugs and the problem of their overuse is a global phenomenon. Studies from India have shown that the use of antimicrobial agents varies from 24 to 67 percent[3,4]. A study in eastern Nepal had shown that antimicrobials were present in 84 percent of prescriptions and constituted 42.8 percent of the total number of drugs[5]. In Nepal, studies have shown that prescription of large number of drugs, excessive use of antibiotics and injections are common drug use problems[6].

In a study in a teaching hospital the average number of drugs was high and the percentage of prescriptions containing antimicrobials and injections was high[7]. A study in 1992 in 20 health facilities had shown that the average number of drugs per prescription was 2.1 and antibiotics and injections were prescribed in 43 percent and 5 percent of encounters respectively[8]. A study on antibiotic use in clinics and hospitals of the Kathmandu valley found problems in antibiotic use[9]. Drug retailers in Kathmandu were found dispensing antibiotics without a prescription and were engaged in diagnostic and therapeutic behaviour beyond their training[10].

Antibiotics as a group constitute significantly to the drug cost and are claimed worldwide to account for 15 to 30 percent of the total health budget[5]. All antibiotics have the potential to select drug-resistant microorganisms. With the

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widespread use of antibiotics, the prevalence of resistance has increased[10]. Evidence supports the view that consumption of antibiotics is a crucial factor in selecting resistance. However, under use due to various reasons may play as important a role as over use[11]. The primary health care system in Nepal operates at three levels: the primary health centre (PHC), health post (HP) and sub health post (SHP). SHP is the first level of contact of most individuals with the health care system.

The present study was carried out to obtain information on:

a) the demographic characteristics and morbidity patterns of patients attending the SHP during the study period

b) the prescribing patterns, average number of drugs and average cost per prescription

c) percentage of encounters with an antibiotic prescribed and percentage of total drugs constituted by antibiotics and

d) mean ± SD cost of drugs and percentage of the total drug cost constituted by antibiotics.

Methods

The study was carried out over a five-month period (15.08.2002 to 14.01.2003) at the Armala sub-health post, Kaski district, Western Nepal. Out patient records of patients visiting the SHP during the period of study were analyzed.

The age and sex of the patients were noted. The diagnosis in the patient record was noted. The number of old cases was recorded. The drugs prescribed during

the outpatient visits were noted. Information was collected on the most commonly prescribed classes of drugs and on individual drugs. The number of encounters with an antibiotic prescribed and an injection prescribed were calculated. The total number of drugs prescribed was recorded. The percentage of drugs prescribed by generic name was found out. The number of antibiotics per prescription was noted. The mean ± SD number of drugs per prescription and the percentage of total drugs constituted by antibiotics were calculated.

The percentage of drugs and antibiotics prescribed from the Essential drug list of Nepal[12] was obtained. The list for sub health posts was used for calculation. The common indications for which an antibiotic was prescribed were enumerated.

The percentage of total drugs and antibiotics prescribed by injection and the topical route was calculated. The mean ± SD cost of drugs per prescription was determined. The percentage of the total cost constituted by antibiotics was calculated.

Results

One thousand three hundred and seventy-five patients made 1464 visits to the SHP during the study period. Seven hundred and thirty-two patients were male. The age distribution of the patients is shown in Table 1.

Table 1: Age distribution of patients attending the sub health post during the study period

Age	Number (percentage)
< 28 days	10 (0.7)
28 days- 1 year	68 (4.9)
1-10 years	350 (25.4)
10-20 years	263 (19.1)
20-30 years	226 (16.4)
30-40 years	116 (8.4)
40-50 years	131 (9.5)
50-60 years	98 (7.1)

Majority of the individuals [917 (66.7%)] were below the age of 30 years. Acute respiratory infections (ARI) [277 of the 1375 patients (20.14%)] were the most common indication for attending the SHP. Wounds, trauma and injuries [120 patients (8.72%)] were the second most common reason. Acid peptic disease (APD) [84 patients (6.1%)], skin infections [72 patients (5.24%)], dysentery [64 patients (4.6%)], scabies [48 patients (3.5%)] and enteric fever [45 patients (3.3%)] were other common diseases.

A total of 2198 drugs were prescribed during the 1464 visits resulting in a mean number of 1.5 drugs per prescription. Of the 2198 drugs, 1011 (46%) were antibiotics. A total of 1395 drugs (63.5%) were prescribed by generic name. One thousand six hundred and sixty-one drugs (75.6%) were prescribed from the list of Essential drugs for the sub health post level. The percentage of antibiotics prescribed from the Essential Drug list of Nepal was 91.2 percent.

The most commonly prescribed classes of drugs were antibiotics [1011 drugs (46%)] and NSAIDs [612 drugs (27.8%)]. Other commonly prescribed drugs were |antiulcer drugs [109 drugs (4.9%)], antihistaminics [61 drugs (2.8%)], antifungals [53 drugs (2.4%)] and anthelminthics [41 drugs (1.86%)]. Table 2 shows the most commonly prescribed drug classes in the SHP during the study period.

Table 2: Most commonly prescribed drug classes in the sub health post (n=2198)

Drug class	Number (percentage)
Antibiotics	1011 (46)
NSAIDs	612 (27.8)
Antiulcer drugs	109 (4.9)
Antihistamines	61 (2.8)
Antifungals	53 (2.4)
Anthelminthics	41 (1.86)

An antibiotic was prescribed in 877 encounters (59.9%) while an injection was prescribed in 33 encounters (2.25%). Majority of the patients who were prescribed an antibiotic [764 (87.1%)] received a single antibiotic, two antibiotics were prescribed to 92 patients while 21 patients received three antibiotics. The common indications for which an antibiotic was prescribed were ARI (199 patients), wounds and traumatic injuries (111 patients), skin infections (65 patients) and enteric fever (42 patients).

[504 drugs (22.9%)], cotrimoxazole [274 drugs (12.4%)] and amoxicillin [236 drugs (10.73%)] were most commonly prescribed. Injectable preparations accounted for 37 of the 2198 drugs prescribed (1.68%). Procaine penicllin was the most commonly prescribed injectable preparation. One hundred and seventy-one drugs (7.8%) were prescribed by the topical route. Chloramphenicol eye drops, chloramphenicol ointment and applicaps and benzyl benzoate suspension were most commonly prescribed. Nineteen antibiotics (1.87% of the total antibiotics) were prescribed by injection while 58 antibiotics (2.6%) were prescribed topically.

Table 3: Most commonly prescribed drugs in the SHP during the study period (n= 2198)

Drug	Number (percentage)
Paracetamol	504 (22.9)
Cotrimoxazole	274 (12.4)
Amoxicillin	236 (10.7)
Metronidazole	187 (8.5)
Chloramphenicol	162 (7.4)
Ibuprofen	94 (4.3)
Antacid	87 (3.9)
Tetracycline	63 (2.9)

The mean ± SD cost of drugs per prescription was 54.2 ± 38.6 Nepalese rupees (0.73 ± 0.52 US$). Antibiotics accounted for 58.1 percent of the total drug cost. Various problems were noted in 138 prescriptions (9.4% of total). The use of antibiotics in gastroenteritis, in non-infected scabies and in pyrexia of unknown origin (PUO) was observed. Problems were also observed in the use of antibiotics in lower respiratory tract infections (LRTI). The use of tonics and multivitamin preparations was low. The

key drugs were all available in the SHP. In Nepal, oral rehydration solution (ORS), cotrimoxazole tablet, paracetamol tablet, mebendazole tablet, tetracycline eye ointment, ferrous sulfate + folic acid tablet, antacid tablet, amoxicillin capsule, procaine penicllin and benzyl benzoate are key drugs[6]. The availability of key drugs shows an effective drug procurement and supply system.

Discussion

Drug utilization studies are important for obtaining data about the patterns and quality of use, the determinants of drug use and the outcomes of use. The main aim is to facilitate the rational use of medicines in populations[13]. The Armala SHP is manned by a certified medical assistant (CMA). The SHP conducts outreach programs and runs outpatient department from 10 am to 2 pm (Sunday to Thursday) and from 10 am to 1 pm (on Fridays).

ARIs were the most common indication for attending the SHP followed by traumatic injuries. In a study in a health centre in Kathmandu, enteric/viral fever, cut/injury and allergy were the commonest diseases among males while viral fever, back ache and allergy were the most common illnesses among females[14]. The mean number of drugs per prescription is less than that reported previously[8]. The average number of drugs per prescription was 1.5. A previous study had shown that an average of 1.26 drugs were prescribed at the SHP level[15]. A study in Pakistani public sector health facilities had reported a mean of 2.7 drugs per prescription[16]. A study in Iran[17] had reported a mean of 4.4 drugs per encounter while in Jordan the mean number of drugs was 2.3[18]. Increased number of drugs can lead to increased risk of drug interactions, errors of prescribing and non-compliance.

In our study, 63.5 percent of drugs were prescribed by generic name. The number is more than the 44 percent prescribed by generic name in a previous study[8]. In Iran 98 percent of drugs were prescribed by generic name[17]. In an Ethiopian study more than 89 percent of drugs in health centres and 71 percent in health stations were prescribed by generic name[19]. The brand names of drugs used in our study were of Sajha drugs and Royal drugs who were the main suppliers to the SHP in the majority of cases.

75.6 percent of drugs were prescribed from the Essential drug list of Nepal. The percentage is less than the 86 percent reported previously[8]. The percentage is less than that reported from Jordan[18] and Tanzania[20]. Active implementation of an Essential drug list has been recommended as an important measure to improve drug use in developing countries[21].

An antibiotic was prescribed in 59.9 percent of encounters and accounted for 46 percent of drugs prescribed. The number is more than the 43 percent of encounters with an

antibiotic prescribed reported previously[8]. In Pakistan, antibiotics were prescribed in 52 percent of encounters[16]. In Iran and Jordan antibiotics were prescribed in 61.9 percent and 60.9 percent of encounters respectively[17,18]. In Nepal, 52.4 percent of patients received at least one antibiotic in terai districts whereas the percentage was 45.2 percent in hill districts[6]. As already detailed excessive antibiotic use is an important factor contributing to resistance[11]. However, due to varying morbidity patterns and other influences it may be difficult to compare the results from different studies.

An injection was prescribed in 2.25 percent of encounters. This is less than the 5 percent reported previously[8]. A total of 37 of the 2198 drugs were injections. Procaine penicillin [19 of the 2198 drugs (0.9%)], multivitamin [4 (0.18%)], tetanus toxoid [3 (0.14%)] and depo provera [3 (0.14%)] were the common injections prescribed. In Iran injections were prescribed in 58 percent of encounters[17]. In Tanzania[20] and Uzbekistan[22] injections were prescribed in 38 percent and 57 percent of encounters respectively. Previous studies in Nepal had shown that 8.8 percent of encounters in terai districts and 3.2 percent in hill districts had received an injection[6]. Percentage of encounters with an injection prescribed should be as low as possible because of the risk of communicating diseases and the increased use of healthcare resources.

Antibiotics, NSAIDs, antiulcer drugs, antihistaminics were commonly prescribed. Paracetamol, cotrimoxazole and amoxicillin were the most commonly prescribed drugs. In Iran, NSAIDs, antibiotics, CNS drugs, gastrointestinal drugs, corticosteroids and vitamins were commonly prescribed[17]. In India, antibiotics, analgesics and NSAIDs, vitamins, cough syrups and antihistamines were commonly prescribed[23].

The mean ± SD cost of drugs was 54.2 ± 38.6 Nepalese rupees (0.73 ± 0.52 US$). The cost was higher than that reported in a previous study[15]. Antibiotics accounted for 58.1 percent of the total costs. Cost is an important factor governing access to and use of medicines in developing countries.

Use of antibiotics in acute gastroenteritis, pyrexia of unknown origin, non-infected scabies and LRTI were problems observed. The WHO Model prescribing information[24] and the Standard Treatment Schedule[25] were used as reference standards while analyzing the prescriptions.

Our study had a number of limitations. The study was retrospective and seasonal variations were not considered. The patient care indicators were not studied. The study was limited to a single health centre.

Conclusions

The average number of drugs prescribed was lower than that reported elsewhere. This is to be encouraged. The percentage of drugs prescribed from the Essential drug list of Nepal should be increased. Use of antibiotics in predominantly viral infections should be discouraged. Further studies for a longer period of time in a greater number of health facilities are required.

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