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ORIGINAL RESEARCH ARTICLE

Prescribing Pattern of Antimicrobials in the In-Patients Department of Obstetrics and Gynaecology at A Tertiary Care Teaching Hospital at Nepal

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ABSTRACT

Background and Objectives: The study of prescribing patterns is a part of medical audit and seeks to monitor, evaluate if necessary, and suggest modifications in prescribing practices to make medical care rational and cost effective.A prospective study was conducted by audit of prescriptions in the in-patients of obstetrics and gynecology department at B.P. Koirala Institute of Health Sciences, Nepal to evaluate the prescribing pattern of antimicrobial agents (AMA).

Methods: Women from 25years to 45years of age were included in this study. The pattern of prescribing was recorded prospectively from the case records of in-patients of obstetrics and gynecology, from 2nd July 2013 to 2nd August 2013. Data collected on a specially designed proforma consisted of patient and treatment details. Number of prescriptions for a particular drug was used to express the prescribing frequency of that drug. Fixed dose combinations were counted as one. Data was analyzed to find out the pattern of diseased condition in women and prescribing pattern of AMA using WHO indicators.

Results: A total of 199 patients were included, out of which 186 received AMA, with a mean of 1.27 AMA. The drugs were prescribed by generic name. Ampicillin was the most frequently prescribed AMA followed by Metronidazole, Cefazoline, Gentamicin, Cefotaxime and Ciprofloxacin.**Conclusions:** Duration of AMA prophylaxis can be reduced and also the frequency of prescribing AMA may be brought down by prescription audit at regular intervals. As far as possible use of one to two AMA of wider spectrum should be used for prescribing and AMA policy together with therapeutic guidelines should be laid down to guide junior clinicians.

Key Words: Prescribing pattern, Drug audit, Antimicrobial agents (AMA), Obstetrics and gynaecology

INTRODUCTION

Prescribing practices are a reflection of health professional's abilities to discriminate among the various choices of drugs and determine the ones that will most benefit their patients [1,2]. The study of prescribing patterns is a part of medical audit and seeks to monitor, evaluate if necessary, suggest modifications in prescribing practices to make medical care rational and cost effective [3]. In the absence of such studies, the prescriber is left without the benefit of chance to improve.

The major problems behind the maternal death in Nepal are the results of unsafe delivery practices due to ignorance, poor knowledge and illiteracy. The leading causes of maternal mortality in Nepal are post-partum hemorrhage, septic induced abortion and its complications followed by puerperal sepsis and eclampsia etc.[4,5]In order to prevent such complications and to decrease maternal mortality, there is an urgent need to educate the population about antenatal checkup as well as to provide essential antibiotics in cases of infection or prophylaxis of diseases after delivery.

A nested case-control study conducted in Kathmandu, Nepal showed that the low maternal educational level is significant risk factors for home delivery associated with some post natal complications like fever, bleeding and abdominal pain compared to those with higher education [6].

Thus the objective of our study was to evaluate the prescribing pattern of antimicrobials in department of obstetrics and gynecology at B.P. Koirala Institute of Health Sciences and to help the clinicians to make a more rational use of

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antimicrobials to decrease the incidence of antimicrobial resistance among patients.

METHODS

B.P. Koirala Institute of Health Sciences is a deemed university in the eastern part of Nepal. The hospital has 600 beds out of which 15% are for the obstetrics and gynecology department. Women of child bearing age group are admitted under obstetrics and gynecology department. The pattern of drug prescribing was recorded prospectively from the case records of obstetrics and gynecology inpatients for a period of one month from 2nd july 2013 to 2nd august 2013. The data collected on a specially designed performa consisted of patient and treatment details and for any additional information, the doctor in charge or nursing staff were enquired.

Each drug/ drug preparation used was counted as one and the number of prescriptions for a particular drug was used to express the prescribing frequency of that drug. Fixed dose combinations were counted as one . The prescriptions were analyzed with respect to group, number and indications of AMA use and duration of use. Percentage of encounter with generic name with antibiotics and percentage of encounter with injections were determined.Data was analyzed to find out the pattern of obstetric and gynecological diseases and prescribing pattern especially of antimicrobials using WHO drug indicators.

RESULTS

One hundred and ninety nine women were admitted to the obstetrics and gynecology ward during the study period of one month (2nd july 2013 to 2nd august 2013). The mean age of thepatients was 26.39 and average stay of patients in hospital was 878 (4.41) days. Most of the patients were from the nearby districts of eastern Nepal, and the maximum from the Sunsari district (**Table 1**). Total number of prescriptions with antimicrobial agents was 186 (93.47%) and those without AMA were 13(6.53%) (**Table 2**). Among the prescriptions with AMA, one hundred and fifty five cases (77.89%) were with surgical intervention while thirty one cases (15.58%) were without surgical intervention (Table-3). In patients who received AMA with surgical intervention, the most common use was with episiotomy 107 cases(53.77%) followed by lower segment caesarian section 27 cases(13.57%), hysterectomy 11cases(5.53%) (**Table 3**). In patients who received AMA without surgical intervention, the most common use was with abortion 9 cases(4.52%), followed by UTI, pelvic inflammatory disease cases 6 each (3.02%) (Table 3). All 186 patients received a total of 253 AMA with 1.27 mean AMA/patient. Among the patients with surgical intervention 112 (56.28%) received single AMA while 43(21.61%) received combination of AMA (**Table 4**). Among patients without surgical intervention 15(7.54%) received single AMA while 16(8.04%) received combination of AMA. (**Table 5**) shows that 107 patients i.e. 53.77% (among surgical intervention cases) received AMA through oral route while 48 patients i.e. 24.12% received AMA through IV route, it also shows that 7 patients i.e. 3.52%, among non-surgical intervention, received AMA through oral route and 24 patients i.e. 12.06% received AMA through IV route. Ampicillin was the most frequently prescribed AMA while the next in decreasing order were metronidazole, cefazoline, gentamicin, cefotaxime and ciprofloxacin. There was no mortality in the patients in this study.

Table 1: Demographic Data Of Patients (n=199)

S. No	Name of districts	Number (%)
1	Sunsari	123(61.80)
2	Morang	30(15.07)
3	Jhapa	12(6.03)
4	Dhankuta	9(4.52)
5	Saptari	6(3.01)
6	Siraha	4(2.01)
7	Dhanusha	3(1.51)
8	Panchthar	2(1.00)
9	Tehrathum	2(1.00)
10	Khotang	2(1.00)
11	Ilam	1(0.50)
12	India	1(0.05)
13	Bhojpur	1(0.05)
14	Sarlahi	1(0.05)
15	Shankhuwaswa	1(0.05)
16	Udaypur	1(0.05)

Table 2:Prescription Pattern of Obstetrics and Gynaecology In-Patients (n=199)

Bacteriological Data	Number(%)
Prescription with antimicrobial agent	186(93.47)
Prescription without antimicrobial agent	13(6.53)
Culture requested	34(17.08)
Organism isolated	12(6.03)
Organism not isolated	22(11.06)
Organisms (n=12)	Number(%)
Enterococci	4(33.33)
E. coli	2(16.66)
Pseudomonas aeuroginosa	2(16.66)
Streptococcus haemolyticus	1(8.33)
Staphylococcus aeureus	1(8.33)
Acenobacter	1(8.33)
Klebsiela	1(8.33)
Name of most frequently prescribed antimicrobial agents after sensitivity	Number (%)
Ampicillin	156 (61.66)
Metronidazole	59(23.32)
Cefazoline	21(8.30)
Gentamicin	8(3.16)
Cefotaxime	5(1.98)
Ciprofloxacin	4(1.58)

Table 3: Patients with and without Antimicrobial Agents (n=199)

Patients with surgical intervention receiving antimicrobials	**Number (%)**
Episiotomy	107(53.77)
Lower segment caesarian section	27 (13.57)
Hysterectomy	11 (5.53)
Oopherectomy	8 (4.02)
Rupture uterus (Laprotomy)	2 (1.01)
Patients without surgical intervention receiving antimicrobials	
Carcinoma cervix	4 (2.01)
Abortion	9 (4.52)
Urinary tract infection	6 (3.02)
Pelvic inflammatory disease	6 (3.02)
Procedencia	2 (1.01)
Intrauterine death	4 (2.01)
Patients not receiving antimicrobial agents and not undergone any surgical intervention	
Molar pregnancy	1 (0.50)
Labour pain	8 (4.02)
Menorrhea	1(0.50)
Ectopic pregnancy	1(0.50)
Post partum and eclampsia	1(0.50)
Endometriosis	1(0.50)

Table 4:Antimicrobial Data (n=199)

Parameter	**Number of Surgery done (%)**	**Number of Surgerynot done (%)**
Number of antimicrobial agents per prescription	No. of drugs (%)	No. of drugs (%)
0	0	13 (6.53)
1	112 (56.28)	15 (7.53)
2	37 (18.59)	14 (7.03)
3	6 (3.01)	2 (1.00)
C/S requested	27 (13.57)	7 (3.52)
C/S not requested	128 (64.32)	24 (12.06)
Organism isolated	5 (2.51)	7 (3.52)
Organism not isolated	22 (11.05)	0
AMA requested	155(77.89)	31 (15.58)
AMA not requested	-	13 (6.53)
AMA single	112 (56.28)	15 (7.54)
AMA combination	43 (21.61)	16 (8.04)
IV	48 (24.12)	24 (12.06)
Oral	107 (53.77)	7 (3.52)
<24 hours	9 (4.52)	3 (1.51)
>24 hours	3 (1.51)	0
<72 hours	6 (3.02)	0
>72 hours	137 (68.84)	28 (14.07)
Preoperative	10 (5.03)	0
Postoperative	145(72.86)	0
Operation : Clean	46 (23.12)	0
Clean contaminated	107 (53.77)	0
Contaminated	2 (1.01)	0

C/S: Culture sensitivity testing, AMA: Antimicrobial agent, IV: Intravenous

Table 5: Commonly Used Antimicrobial Agents in Obstetrics/Gynaecology (n=186)

Antimicrobial combination	**Clean**	**Contaminated**	**Clean contaminated**	**Surgery not done**
Ampicillin+Gentamicin+ Metronidazole	3	-	-	-
Ampicillin+Metronidazole	13	-	10	4
Metronidazole+Cefazolin	5	-	-	2
Ampicillin+Gentamicin+ Metronidazole	-	2	-	1
Metronidazole+Cefazolin	7	-	-	2
Cefotaxome+Metronidazole+ Gentamicin	-	-	-	1
Ciprofloxacin+Metronidazole	1	-	-	2
Ampicillin+Metronidazole	-	-	-	1
Cefotaxime+Metronidazole	1	-	-	2
Ciprofloxacin+Metronidazole	-	-	-	1
Ciprofloxacin+Metronidazole+ Gentamicin	1	-	-	-
Cefazolin	5	-	-	-
Ampicillin	10	-	97	15
Total no. of patients with AMA	**46**	**2**	**107**	**31**
Total no. of AMA (253)	**81(43.55)**	**6 (3.23)**	**117 (62.90)**	**49(26.34)**

DISCUSSION

The present study was undertaken to evaluate the prescribing pattern of AMA in department of obstetrics and gynecology in the in patients of BPKIHS. Serial studies such as this help to evaluate the changing trend with respect to prescribing patterns.

In developing countries where the infection rate is very high in women patients during or after delivery, the clinicians face shortage of laboratory facilities for investigations like culture and sensitivity tests (C/S) thus making it hard for the clinician to give a more rational medication to the

patient. An international investigation sponsored by WHO showed that pregnant women ingest an average of three prescription medications during pregnancy (average 1-15) [7].

Various factors influence the prescribing behaviour of clinicians and to change the behaviour it is necessary to understand the reasons behind it [8, 9].It is necessary to define the prescribing pattern and to target the irrational prescribing habits for sending a remedial message [8, 10]. Infectious diseases, maternal and perinatal ailments, and nutritional deficiencies, termed "Group I disorders" by the World Bank, are the leading causes of illness and death in Nepal. Deaths among women peak during the childbearing age (15-44) - with about 28 percent of deaths in this age group related to abortion and its associated complications[11]. Thus in order to decrease the percentage of deaths of women it is necessary to take utmost care of the women during pregnancy and to provide the required AMA together with other drugs to reduce the complications during pregnancy and after delivery.

In one of the study done in the Manipal college of Health sciences it was found that antimicrobials taken by pregnant women accounted 4.6% of total prescriptions[12]. In our study total 199 patients were included from in-patients of obstetrics and gynecology department of BPKIHS, which belonged to different parts of eastern Nepal. Of the 199 prescriptions from the in-patients of obstetrics and gynecology department of BPKIHS, 186 (93.46%) received antimicrobials whereas 13 (6.53%) prescriptions were without antimicrobials (Table-2). The average number of antimicrobials/patient was 1.27. The vulnerable age group during pregnancy needs all the possible medical care with safe and appropriate drugs. To facilitate this knowledge of current prescribing pattern is essential. No such studies regarding drug prescribing during pregnancy have been reported in Nepal. Hence, this present study was undertaken to develop base line data on prescribing pattern with an emphasis on antimicrobial agent use in obstetrics and gynecology inpatients. The feedback of this study would be utilized to sensitize the prescribers to the current prescribing practice and issues needing attention and intervention.

Study of prescribing pattern helps in identifying the rationality in prescribing as well as identifying the incidence of resistance developed in patients against the drug prescribed. Rational drug prescribing can be defined as appropriate drugs taken in the right dose, at correct time intervals and for sufficient duration[13].

Maternal drug use during pregnancy may pose a teratogenic risk to the foetus. However, the recommendation to avoid all drugs during early pregnancy is unrealistic and may be dangerous [14-16]. Pregnancy should not deter clinicians from providing their patients with appropriate management of their medical conditions, hence, prescribing in pregnancy is an unusual risk benefit situation[14,17,18]. Information on the use of drugs during pregnancy is scarce and rather anecdotal [12].Careful consideration of benefit to the mother and the risk to the fetus is required when prescribing drugs during pregnancy and after delivery

In a study conducted in Nigeria twenty different types of antibiotics were encountered in the study conducted in the department of obstetrics and gynecology. Penicillins 279 (55.6%) were the most frequently used antibiotics for the antenatal clinics. Other antibacterial agents included metronidazole 59 (11.8%), macrolides 53 (10.6%), cotrimoxazole 37 (7.4%), phythalylsulphathiazole 27 (5.4%) 4-quinolones 12 (2.4%), nitrofurantion 12 (2.4%), aminoglycosides 9(1.8%), and tetracycline 1 (0.2%). The average maternal age obtained in this study was similar to that obtained in a similar study in Nepal[14].Primigravid women formed the majority of women attending the antenatal clinics. The pattern of medical conditions obtained in this study varied with those reported in Nepal study[14] where problem oriented drug use was mainly due to gastrointestinal tract problems (nausea and vomiting, dyspepsia), and vaginal spotting/ bleeding.

In a similar study conducted by Shah and Shah, 431 cases were taken from the department of obstetrics and gynecology, who received antimicrobials (n=330) for different obstetric (LSCS, membrane rupture) and gynecological (UTI,) disorders, among which ciprofloxacin (201, 60.90%) was maximally used followed by ampicillin(180,54.54%) and metronidazole (131,39.69%). Other drugs used were gentamicin (81,24.54%), cefotaxime (60,18.18%), cephalexin (18,5.45%) and tetracycline(12,3.63%) [19].

Though our study suffered from the disadvantage that neither the prescriber or the patients were

interviewed to assess and record the prognosis of the patients, nevertheless, it provided some basic information on prescribing pattern of AMA in obstetrics and gynecology inpatients in BPKIHS.

Our results indicate that episiotomy (53.77%) after delivery was the commonest reason for admission to the obstetrics and gynecology inpatients in BPKIHS, other reasons being LSCS(13.57%), hysterectomy(5.53%), abortion(4.52%), UTI(3.02%), pelvic inflammatory disease(3.02%). Culture and sensitivity test was requested in 34 patients and organisms were isolated only in 12 (6.03%) cases. The choice of AMA by the prescribers in obstetrics and gynecology inpatients included ampicillin, metronidazole, cefazoline, gentamicin, cefotaxime and ciprofloxacin.

Our study focused on trends of drug utilization pattern particularly of AMA in obstetrics and gynecology inpatients. The high frequency of prescribing may be brought down by developing some treatment guidelines to guide the junior faculty. Developing antibiotic policy and therapeutic guidelines with suitable intervention when required and continued assessment of problems associated with bacterial resistance would facilitate the rational use of AMA. Thus our study helps in exploration of ideas related to rational prescribing by emphasizing on following points:

1) Duration of AMA prophylaxis should be reduced to <24 –24 hrs as against the findings in this study which was >72 hours in (93.55%)cases.
2) Only in presence of gross contamination, should prophylaxis be continued. Duration of prophylaxis is reducing, though still very far from the required of 1-2 days.
3) There is an increasing trend to prescribe single AMA
4) The time of administration of AMA should be modified . AMA should be administered after clamping the cord in caesarean section and not preoperatively or post operatively. In artificial rupture of membranes, episiotomy, it should be administered 30 min before the procedure as against the finding in the study where AMA were administered after the procedures.
5) Number of antimicrobials used and class of antimicrobial used are interdependent. As for as possible use of ONE or TWO of wider spectrum are recommended.

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