

## DRUG UTILIZATION OF ANTIMICROBIALS IN CAESAREAN SECTION

R.UPPAL, S.GUPTA, G.SHOBHA, G.IDHALL, K.DHALL, S.GOPALAN  
AND P.L.SHARMA

### SUMMARY

Antibiotic misuse is a growing problem. This study was carried out to determine the extent of their usage in Caesarean section. Two hundred and twenty five (225) women undergoing this surgery were followed in the Obstetrical wards of the Nehru Hospital attached to the Postgraduate Institute of Medical Education and Research, Chandigarh. The defined daily dose (DDD) of all drugs used and the DDD per 100 bed days were used as units of measurement.

Results showed that all women operated for Caesarean section were routinely prescribed antimicrobials. Two hundred and seven (207) were prescribed ampicillin for variable periods from 1-14 days; thirty six (36) gentamycin for 4-11 days. A small number were prescribed cephalixin, erythromycin, metronidazole and cotrimoxazole.

### INTRODUCTION

Misuse and overuse of antimicrobials is a global problem. The resultant outcome of increased resistance of bacteria to antimicrobials, unnecessary expenditure and above all the risk faced by the patient who receives these drugs, are problems that confront the physician. Among the varying spectra of use of antimicrobials their prophylactic administration must be justifiable. Prophylactic antimicrobials mean, not only those given briefly in the absence of clinical infection, but also those

used where development of infection is anticipated. Studies are reported wherein prophylactic use of antibiotics have been evaluated in high and low risk patients for endometritis (Apuzzio et al., 1983)-the commonest cause of infection following this surgery.

In the present investigation, it was planned to study the pattern and duration of use of antimicrobials in caesarean section. This surgery represents, in most cases, an instance of clean surgery. Some studies on the use of antimicrobials in urology (Hekster et al., 1981) in general practice (Hemminki et al., 1974) are reported. The cost containment

of antimicrobials therapy has been worked out by Barriere in 1985. There are few studies related to their use in caesarean section (Gall, 1979; Duff & Park 1980) Wallace et al., 1983). Here their use may also affect the neonate being nursed by the mother.

**METHODS**

This was a prospective survey of antimicrobial use in the obstetrical ward of the Nehru Hospital attached to the Postgraduate Institute of Medical Education and Research. The proforma to abstract this information from the case files and treatment charts were filled by two of the authors (S.G. and G.S.). Consent to monitor these records was taken from collaborating clinicians. The information collected related to the demographic parameters, indication for antimicrobial prescribing, history of hospitalization, number of antimicrobials prescribed, the dosage, route of administration and the total duration. All women were followed up till discharge. Data was collected for 225 women undergoing Caesarean section over a period of 138 days (from 10.2.1988 to 30.6.88). There were 36 beds in the ward, and occupancy was 100%.

The data was then analysed, and the extent of antimicrobial use expressed as the defined daily dose (DDD), and the DDD per hundred bed days.

**RESULTS**

It was seen that all women undergoing Caesarean section were routinely prescribed at least one antimicrobial drug; some received more than one. The two main antimicrobials were ampicillin (207 cases) and gentamycin (36 cases) for a variable number of days as is depicted in Fig.1. Of the 225 cases followed, one antimicrobial was prescribed to 199 cases, two were prescribed to 21 and three to 5 patients. It can be seen that 81 women

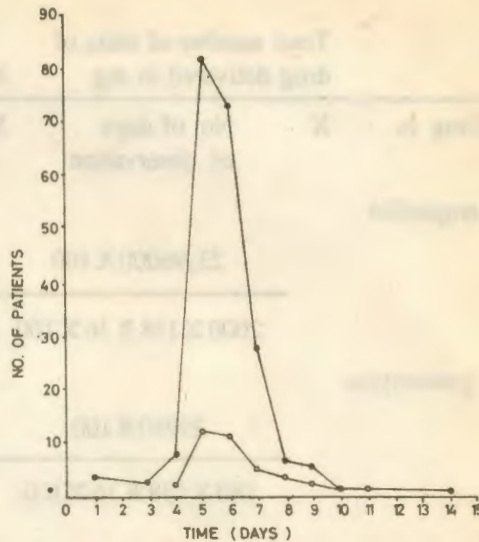


FIG. 1 ACTUAL NUMBER OF PATIENTS RECEIVING (●) AMPICILLIN n=207 (○) GENTAMICIN n=36 VERSUS NUMBER OF DAYS

received ampicillin for 5 days and 72 for 6 days, where as gentamycin was given to 12 cases for 5 days and 11 cases for 6 days, respectively.

**Units of Comparison**

The defined daily dose (DDD) of any drug is its average daily dose for the most

TABLE I

Defined daily dose and DDD/100 bed days of antimicrobials

Antimicrobials	DDD	DDD/100 bed days
Ampicillin	2 mg	24.11
Gentamycin	180 mg	4.46
Nalidixic acid	4000 mg	-
Metronidazole	1200 mg	-
Cotrimoxazole	4 Tabs	-
Cephalexin	2000 mg	-
Cloxacillin	2000 mg	-
Methicillin	2000 mg	-

Total number of units of drug delivered in mg		X	100			
DDDmg in	X	No. of days of observation	X	No. of beds	X	Percentage occupancy index
For ampicillin						
		23,96000 X 100				= 24.11 DDD/100 bed days
		2000 X 138 X 36 X 100				
For gentamycin						
		39960 X 100				= 4.468 DDD/100 bed days
		180 X 138 X 36 X 100				

common indication; the same holds true for antimicrobials, the DDD of antimicrobials prescribed is given in Table I. This is not the recommended dose, but simply a technical unit for measurement. For combinations it may be expressed as number of tablets i.e. cotrimoxazole.

Bergman et al (1980) have introduced the number of DDD's for 100 bed days concept, the DDD per 100 bed days has been chosen as a unit of comparison between hospitals by the World Health Organization, Drug Utilization Research Group. Bed day is each ward per day; the days of admission and the discharge were counted as one bed day. The DDD per 100 bed days was calculated for ampicillin and gentamycin using the formula:

The defined daily dose per 100 bed days for ampicillin was 24.11 and that for gentamycin is 4.468. Consumption of the drug in hospitals expressed in this way gives a rough estimate on the proportion of patients treated with a drug during a fixed period.

## DISCUSSION

Study of factors which dictate the use of an antimicrobial have become a major area of inquiry in fields of biomedical research. Several studies have shown that only 45% of prophylactic courses were judged appropriate and over 80% antibiotics for surgical prophylaxis were given for longer than 24 hrs. In the present study all patients were given perioperative prophylaxis, and except those in whom it had to be discontinued early (for development of side effects) they were given for a minimum of 5-6 days.

If the operation site is likely to be contaminated, antibiotics should be started before surgery and given for a maximum of 48 hours. Longer than 48 hrs courses of antibiotic prophylaxis are unjustified in elective surgery of caesarean section. In all the cases studied it would have been desirable to measure and document parameters of infection like fever, whether surgery done in septic or clean operation theatre and antibiotic sensitivity reports where the use of these drugs for such period is seemed justifiable. In referral hospi-

tal such as ours there may have been high risk patients with endocrinological and cardiologi- cal problems necessitating antimicrobial cover for the surgical procedure of caesarean section.

Prophylaxis with antibiotics for patients with no real evidence of infection is irrational and inappropriate. Do such local surveys influence prescribing of antibiotics in hospitals? They certainly can if local guidelines on antibi- otic use formulated by hospital drug commit- tees can form a basis for continuing education.

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The present study was conducted in a tertiary level hospital...  
 MATERIAL AND METHOD  
 The study included all patients who were operated on by caesarean section...  
 RESULTS  
 The results of the study are shown in Table I...  
 DISCUSSION  
 The results of this study are in accordance with other studies...  
 CONCLUSION  
 The use of antibiotics for prophylaxis in caesarean section should be based on...