DRUG MISUSE
POST-OPERATIVE PROPHYLAXIS WITH ANTIMICROBIALS IN OBSTETRICAL AND GYNAECOLOGICAL SURGERY

by

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Introduction

The widespread use of antimicrobials prophylactically in post-operative Obstetrics and Gynaecological Surgery, given more with faith (like tossing a coin) than knowledge, is the main contributory factor for the emergence of resistant strains of bacteria. As more and more resistant varieties of organisms develop, post-operative morbidity becomes a surgeon's nightmare and the patient's grave yard. Stevens (1964) stated that post-operative morbidity in cases where routine antibiotics were not used was 3% against 7% amongst those receiving antibiotics routinely.

Noticing an increase of morbidity amongst those who were administered antimicrobials routinely-post-operatively, a study was undertaken at Command Hospital (Air Force), Bangalore, to analyse the problem.

Material and Methods

A total number of 600 patients who had undergone gynaecological and obstetrical surgery were selected at random and divided into 2 groups of 300 each. Group A (Trial) was given no antimicrobials post-operatively. Group B (Control) was given injection Ampicillin 500 mg. intramuscularly, 8 hourly for 7 days starting at the immediate post-operative period. High vaginal swabs culture (aerobic) was done in all cases and their relation to post-operative morbidity correlated. No antibiotics were administered pre-operatively and when there was gross infection like obvious vaginitis, the infection was controlled by local treatment. Urine samples were examined microscopically; culture and sensitivity to antimicrobials was determined when indicated. Those with infection were treated with appropriate antimicrobials as revealed by the antibiotic sensitivity test of the pathogen.

As facilities for anaerobic culture in this hospital are limited a limited number of cases (Group C:n = 36) could be subjected to the above study, half of these cases (C_1) as trial and the other half as control (C_2). In view of the small number this anaerobic study was analysed separately. Typing of the pathogenic bacteria was not carried out.

In all cases who developed morbidity, detailed studies were done.

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Results

TABLE I
Operationwise Distribution of Cases

Operation	Number			
	Group A (n = 300)	Group B (n = 300)	Group C	
			C_1 (n=18)	C_2 (n=18)
Puerperal and interval Tubal Ligation	100	100	-	-
Abdominal hysterectomy	50	50	6	6
MTP with sterilisation	50	50	-	-
Lower segment caesarean section	40	40	-	-
Vaginal hysterectomy	32	32	4	4
Unilateral salpingo-oophorectomy (4 were for Ectopic gestation)	12	12	-	-
Sling operation	10	10	3	3
Manchester repair	5	5	-	-
Myomectomy	1	1	-	-

Operationwise breakdown has been detailed in Table I. Out of 600 cases in Groups A & B (Table II A), the morbidity was 20 (7%) and 35 (12%) respectively, the total morbidity being 9%. Morbidity was significantly less ($P < 0.05$) in Group A. Group C (Table II B) had morbidity at 11%, further breakdown be-

TABLE II
Post-operative Morbidity Amongst the 3 Groups and the Predominant Organisms Isolated

A

Predominent Organism	Morbidity				Significance of Difference in percentage
	Group A (n=20	(%(	Group B n=35	(%)	
E. Coli	11	(55)	8	(25)	N S*
Staph. Pyogenes (aureus)	3	(15)	14	40	P<0.05
Klebsiella spp.	3	15	5	14	N S*
Proteus spp.	2	10	5	14	„
Staph. Albus	1	5	1	3	„
Strep. non-haemolyticus	0	0	1	3	„
Providentia	0	0	1	3	„
% of the Total	6.7		11.6		P <0.05

IIB

Organism	Morbidity	
	Group C_1 (n=1)	Group C_2 (n=3)
B		
Bacteroides	1	2
Peptostreptococus	0	1

Difference in proportion between C_1 and C_2 = N S*
*Not significant.

ing 1 (6%) and 3 (12%) amongst its trial and control groups, the difference is not significant.

Amongst pre-operative swabs of Groups A, B and C, pathogenic bacteria were grown in 51%, 48% and 17% respectively. Predominant bacteria being Escherichia coli (*E. coli*), Klebsiella spp; Proteus spp, in groups A and B and Bactoroids in Group C.

Table IIA depicts that *E. Coli* was the commonest organism isolated in patients having morbidity. Other organisms in order of recurrence being Klebsiella spp. and Staph. pyogenes. *E. Coli* and Klebsiella were also the commonest organisms isolated in pre-operative culture. A significant ($P < 0.05$) percentage of morbidity was attributable to Staphylococus pyogenes in Group B. Predominent organism was Bacteroids in Group C.

Table III illustrates that though not statistically significant, the difference in incidence of wound sepsis (43%) and pelvic infection (23%) was higher in Group B and that of urinary infection (45%) higher in Group A. Incidence of urinary infection was directly proportional to the number of catheterisations,

TABLE III

Post-operative Morbidity and Bacterial Culture

A Prominent organism		MORBIDITY						
		Urinary Infection	Haemo-rrhage	Pelvic infection (Vaginal discharge)	Abdominal wound sepsis	Pelvic Abscess	Total No.	%
	Groups							
E. Coli	A	5	-	3	3	-	11	55
	B	4	-	2	2	-	8	23
Staph. pyo-genes	A	-	1	-	2	1	3	15
	B	-	-	3	9	1	4	40
Klebsiella. Spp.	A	2	-	1	-	-	3	15
	B	2	-	1	1	0	5	14
Proteus Spp.	A	2	1	-	-	-	2	10
	B	2	-	1	1	0	5	14
Staph. albus	A	-	-	-	1	0	1	5
	B	-	-	1	-	-	1	3
Staph. non-haemolyticus	A	-	-	-	-	-	-	-
	B	-	-	-	1	-	1	3
Providencia	A	-	-	-	-	-	-	-
	B	-	—	-	1	-	1	3
Total	A	* 9 (45%)	-	* 4 (20%)	*6 (30%)	1	20	100
	B	8 (23%)		8 (29%)	15 (49%)	1	35	100

*NS = Difference not significant

B GROUP C

Predominent	Organism	Morbidity		Total
		Pelvic infection (Vaginal discharge)	Abdominal wound sepsies	
	Groups			
Bacteroides	C_1	1	1	2
	C_2	-	1	1
Pepto strepto-coccus	C_1	-	-	-
	C_2	1	-	1
Total	*C_1	1	1	2
	C_2	1	1	2

*NS: Difference not significant.

which were more in Group A. Commonest causes of morbidity in Group A and B were urinary tract infection, wound sepsis and vaginal discharge due to pelvic infection. Statistically, the difference in morbidity between C_1 and C_2 was not significant, the morbidity being due to wound sepsis and pelvic infection. In all 3 groups, morbidity was more in patients undergoing vaginal than abdominal hysterectomy. *E. Coli* having been isolated in majority of cases.

Discussion

Simmons and Stolley (1974) stated that hundreds and thousands of patients are unnecessarily exposed to the hazards of antimicrobials because of inappropriate use. Recently, Castle *et al* (1977) found that one third of all their patients received antimicrobials and in 64% these were either not indicated or in-appropriately administered.

Post-operative morbidity in this study was 9%. Lidwell (1961) reported that such figures for individual hospitals ranged between 5 and 22 per cent. Amongst groups A and B in our study, morbidity was significantly greater ($P < 0.05$) in Group B, which was given post-operative prophylactic antibiotics. Stevens (1964), Surange and Rai (1979) had similar results. The role of non-sporing anaerobic bacteria in clinical infection has attracted great interest in reeent years and the importance of non-clostridial anaerobes as common causes of post operative morbidity in gynaecological and obstetrical surgery has gained increasing awareness. Lalitha and Koshi (1980) isolated anaerobic gram negative non-spore forming bacteria (AGNNSB) in 31% and Hinduja and Mehta (1979) in 43% of genital tract infection. In this study, 36 cases were subjected to anaeorbic studies and revealed anaerobes in 4 cases with bacteroides being the predominent organism in Bosio and Taylor (1973) have stressed the high morbidity rates in genital tract infection caused by bacteroides and their role in abdominal sepsis has also been stressed. Two of our 4 isolates were from abdominal wounds. However, in our study no conclusion can be made due to the small number studied. There was no statistically significant difference in morbidity amongst groups C_1 and C_2.

Predominent bacteria was *E. Coli* in groups A and B both in pre-operative cul-

ture and also amongst patients having postoperative morbidity. Agarwal and tumar (1979) had similar results while Pearson and Anderson (1970) isolated *E. Coli* in very small number of cases. This may be due to environmental and regional variations in ecology of the vagina. In our study, morbidity was more in patients who underwent vaginal than abdominal hysterectomy and the main organism was *E. Coli* both in pre- and post- operative cultures, suggesting an endogenous infection. Agarwal and Kumar (1976) had similar results and conclusions. Heary *et al* (1973) from the West, report that morbidity was more in patients undergoing abdominal than vaginal hysterectomy. E. Coli and Staph. albus being predominant both in pre-operative culture and post-operative morbidity studies. Many authors have suggested that bacteria responsible for large number of post-operative infections were endogenous. Further work will prove if this source can be completely eliminated before surgery. Ansbacher *et al* (1967) suggested that despite extensive vaginal preparation this is not possible. Though not significant statistically, incidence of urinary infection (45%) was higher in Group A and this was directly proportional to the number of bladder catheterisations. Benner (1967) states that widespread use of antimicrobials have caused a large number of unusual gram negative organisms to prevail in many post-operative infections.

An alarming factor was the significant morbidity ($P < 0.05$) attributable to Staph. aureus (pyogenes) in group B although neither the incidence of pelvic infection nor the incidence of wound sepsis is significantly different in 2 groups. Multiple drug resistant "Hospital" strains of Staph. aureus—which has emerged with increasing use (misuse !) of antimicrobials has made this organism one of the commonest (45%) and most difficult to treat in post-operative infections in the west (Simmons and Stolley, 1974). In this series, commonest cause of morbidity was urinary infection followed by abdominal wound sepsis and pelvic infection with no significant difference in incidence between the two groups A and B. Agarwal and Kumar (1979) in their series observed urinary infection, secondary haemorrhage and wound infection while Heary *et al* (1973) observed wound infection, pelvic infection and septicaemia, in western studies.

Anaerobic organism was isolated from vaginal discharge in 2 and from abdominal wound sepsis in 2 of our cases. Hinduja and Mehta (1979) state that microflora of the female genital tract comprises mainly of anaerobic bacteria and their maximum isolates were from vaginal discharge. Lalitha and Koshi (1980) isolated anaerobes from a variety of sources ranging from genital infections and pelvic abscess to incision-site abscess.

Conclusions

In conclusion, we state that prophylactic post-operative antimicrobial therapy not only increases morbidity significantly but also encourages multiplication of resistant strains and is drug abuse in its truest form.

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