

POST-OPERATIVE MORBIDITY IN GYNAECOLOGICAL AND OBSTETRICAL SURGERY AND ITS RELATIONSHIP TO PRE-OPERATIVE VAGINAL BACTERIAL FLORA

by

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Post operative infections in gynaecological and obstetrical patients can be endogenous or exogenous in origin. Pre-operative bacterial flora have therefore been studied several times. Bollinger (1963) reported positive bacterial culture of vagina in 50% of cases, out of which 41.6% were those of pathogenic organisms. Ansbacher *et al* (1967) reported that most of the pathogens were found only in cervix and uterine cavity was relatively free from them. The commonest were *Esch. coli*, *Streptococci* and *Corynebacterial*. Agarwal (1970) reported *Esch. coli* as the causative organism in some cases of purulent vaginitis and also in post-abortal sepsis (Agarwal and Chawla, 1977). Nissen and Goldstein (1972) demonstrated positive *Esch. coli* cultures in 37 out of 100 cases. 34 of which had fever up to 102°F for two consecutive days exclusive of first 24 hours. According to them *Esch. coli* was increasingly important organism encountered in all forms of surgery. Neary *et al* (1973) isolated pathogenic bacteria

from vagina of 64.8% of patients who were in first half of menstrual cycle as compared to 42.5% in second half. Infections were found more in patients undergoing abdominal hysterectomy than vaginal and the organisms were mainly *Esch. coli* and *staph. albus* in pre-operative cultures. Similar studies have also been conducted by Gupta *et al*, 1973 and George *et al*, 1975. This study was conducted on 100 gynaecological and obstetrical patients undergoing surgery with a view to study their pre-operative vaginal flora and trace their possible relationship to post-operative infections and morbidity. An attempt was also made to study the relationship of morbidity with the phase of menstrual cycle during which their operations were done.

Material and Methods

High vaginal swab cultures were done pre-operatively in 100 patients who were subjects for surgery. No antibiotics were administered pre-operatively. When there was gross infection like obvious vaginitis, cervicitis, the infection was treated by local treatment. The urine was also examined microscopically and culture and sensitivity to antibiotics was determined. Those who had urinary infection were treated pre-operatively with

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specific antibiotics and chemo-therapeutic drugs. Three vaginal swabs were examined for specific infections like *Trichomonas vaginalis* and *Candida*. If the latter infections were discovered these were treated with specific therapy before surgery.

In post operative period, high vaginal swabs were cultured in all the patients, 48 hours after the operation. Urine was also examined and cultured for evidence of urinary infection. In the cases who developed morbidity, studies were done in detail.

Observation

In 51% of cases pathogenic bacteria were grown in pre-operative swabs and in 49% of cases the cultures were sterile, the predominant bacteria being *Esch. coli* and *Klebsiella* spp. Table I. The respective diagnosis and age of the patients is given in Tables II and III. The operation wise analysis has been detailed in Table IV. Out of these 100

TABLE I

Bacterial Culture of Pre-operative Vaginal Swab Culture

Sterile	49
<i>Esch. Coli</i>	18
<i>Klebsiella</i> spp.	6
<i>Proteus</i> spp.	2
<i>Staph. pyogenes</i>	5
<i>Staph.</i> (coagulase Negative)	1
<i>Strepto. faecalis</i>	1
<i>Klebsiella</i> spp. and <i>Esch. Coli</i>	1
<i>Staph. pyogenes</i> and <i>Klebsiella</i> spp.	1
<i>Staph. pyogenes</i> and <i>Esch. Coli</i>	1
Micrococci	9
Diphtheroids	2
<i>Candida</i>	4
	100

TABLE II
Pre-operative Diagnosis

Diagnosis	Number
Uterine prolapse	18
Dysfunctional uterus	17
Bleeding	
Uterine fibroids	5
Ovarian tumours	6
Cervical polyp	1
Ectopic pregnancy	3
Medical termination of pregnancy and sterilizations	29
Lower segment caesarean section	13
Sterility	8
	100

TABLE III

Age

21-30 years	45
31-40 years	20
41-50 years	27
51-60 years	8
	100

TABLE IV

Operation-wise Distribution of Cases

Operation	Number
Abdominal hysterectomy	19
Vaginal hysterectomy	16
MTP with sterilization	29
Myomectomy	2
Ectopic pregnancy	3
Ovarian Cystectomy	6
Manchester repair	4
Lower segment caesarean section	13
Dilatation and curettage	8
	100

cases, 18 patients developed post-operative morbidity of mild to moderate nature. The nature of morbidity being urinary infection in 5 cases, fever after 48 hours in 2 cases, secondary haemorrhage in 3 cases, wound infection, foul discharge in 7 cases and pelvic abscess in

1 case Table V. The analysis of the bacterial growth in post-operative cultures who developed morbidity is recorded Table VI.

Comments
In our series, the maximum number of operations were done in younger age

TABLE IV
Bacterial Culture and Morbidity

Bacteria	Urinary infection	Fever 100°F	Haemorrhage	Wound infection & discharge	Pelvic abscess	Total
Esch. coli	4	—	1	4	—	9
Klebsiella sp.	—	1	1	1	—	3
Esch. coli & Klebsiella	1	—	1	—	—	2
Esch. coli & Staph. pyogenes	—	—	—	2	1	3
Proteus sp.	—	1	—	—	—	1
Total	5	2	3	7	1	18

TABLE VI
Organisms Isolated in Patients Having Morbidity

(Total patients being 18)		
Esch. Coli	9	50%
Klebsiella spp.	3	16.7%
Esch. coli and Klebsiella spp.	2	11.1%
Esch. coli and staph. pyogenes	3	16.7%
Proteus spp.	1	5.5%
	18	

It was also observed that in the patients in whom operations were done in the second half of the menstrual cycle, the incidence of morbidity rate was much lower Table VII.

group i.e. 65% in 21-40 years and 35% in above 40 years of age.

Pathogenic organisms were isolated in 51% in high vaginal swab culture pre-operatively and 49% were sterile; Esch. coli being the predominant bacteria in 18%, Klebsiella spp. and Staph. pyogenes being 6% and 5% respectively. Candida was cultured in 4% and proteus spp. in 2% cases. The other organisms cultured are shown in Table I.

The high vaginal swab culture in patients having morbidity also demonstrated Esch. coli and Klebsiella sp. in 9 and 3 cases respectively. Combined growth of Esch. coli with other pathogens

TABLE VII
Morbidity According to Phase of Menstrual Cycle

Phase of cycle	No. of patients operated	Morbidity	%
1st half of menstrual cycle	21	8	38.1
2nd half of menstrual cycle	29	2	6.9
Pregnancy 8 weeks-40 weeks	42	2	4.8
Menopause	8	5	62.5

was demonstrated in 5 cases and proteus spp. in one case Table IV.

In our series *Esch. coli* was observed to be the commonest organism in pre-operative culture as well as in patients having morbidity postoperatively. Next place was occupied by *Klebsiella* spp. alone or in combination with *Esch. coli*. Agarwal (1970) reported *Esch. coli* as being important organism in causing purulent vaginitis in gynaecological cases. Agarwal and Chawla (1977) again reported *Esch. coli* and *Staphylococcus* as important organisms in causing post abortal infections.

Pearson and Anderson (1970) isolated *Bacteroides* spp. in cases of adnexal pelvic abscesses and incision site abscesses. *Esch. coli* was found in a very small number of cases. In our series *Bacteroides* spp. were not detected. This may be due to environmental and regional variations in ecology of the vagina. In our series combination of *Esch. coli* with other pathogens and *Klebsiella* occupied the next place Table VI. Neary *et al* (1973) also noted *Esch. coli* and *Staph. albus* in pre-operative cultures.

In these series nearly 30% of the patients had the same pathogens in pre and post operative swabs suggesting that the infections were autogenous. These workers have gone to the extent of suggesting the treating of patients pre-operatively. Ledger *et al* (1971) also suggested that bacteria responsible for many post operative infections were endogenous. Ansbacher *et al* (1967) found the pathogens in the cervix and observed that infection could not be completely eliminated from the cervix despite extensive vaginal preparations with antibacterial agents.

In our series those developing morbidity had nearly the same kind of bacterial

growth as were found pre-operatively suggesting that the infection in most cases could be endogenous. Further work is required to be done to see if these bacteria can be eliminated before surgery by preparation of the vagina and morbidity be reduced.

In our series lesser incidence of morbidity was observed when operations were performed in second half of menstrual cycle (6.8%) as compared to (38%) when operations were done in first half of the cycle Table VII. This finding is in agreement with the finding of Neary *et al* (1973) who also observed more morbidity in cases operated in the first half of menstrual cycle.

In our series the commonest morbidity was urinary tract infection, secondary haemorrhage and wound infections Table IV. Neary *et al* (1973) in their series observed wound infection, pelvic infection, subphrenic abscess and septicaemia. In our work the complications were of mild nature and responded either to local treatment or to specific antibiotics.

In our series least morbidity was observed in pregnant women undergoing operations. These patients had undergone medical termination of pregnancy with sterilization or caesarean section Table VII. Observing lesser incidence of morbidity in the second half of the cycle and also in pregnancy it appears that some hormone is capable of strengthening defensive mechanism of the mother probably of progesterone. Further work is required to support this hypothesis.

There was more morbidity in cases of vaginal hysterectomy and Manchester operation specially of the nature of local sepsis resulting in foul smelling discharge and secondary haemorrhage. Abdominal operations were comparatively free from infection and morbidity. This is in con-

trast to the observation of Neary *et al* (1973) who observed more morbidity in abdominal operations. In the former, the contributory factor could be age, long standing prolapse, poor hygienic environments and lower resistance of the tissues. In our series higher incidence of morbidity was observed in higher age group, this is in contrast to the finding of Goosenberg *et al* (1969) where more morbidity was observed in younger age group patients.

Summary and Conclusions

1. In 100 patients undergoing surgery, vaginal flora by high vaginal swabs were studied pre-operatively and their correlation with post-operative morbidity was observed.

2. The pathogenic bacteria were grown in 51% of cases and in 49% the cultures were sterile.

3. The morbidity was observed in 18% of cases, the morbidity being mainly urinary tract infection, local sepsis and secondary haemorrhage.

4. The commonest bacteria grown were *Esch. coli* and *Klebsiella sp.* (18% and 6% respectively) in pre-operative cultures.

5. In patients who developed infection and morbidity, bacterial growth observed was also *Esch. coli* and *Klebsiella sp.* in majority of cases.

6. There was reduced incidence of morbidity when the operations were done in the second half of the cycle.

7. The morbidity was low in pregnant women undergoing surgery i.e. Medical termination of pregnancy with sterilizations and caesarean sections.

8. The morbidity was noted more in vaginal operations than in abdominal operations.

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