BACTERIOLOGY OF UPPER VAGINA AND ENDOCERVIX AT TERM PREGNANCY

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SUMMARY

Microbial flora of upper vagina and endocervix and its antibiotic sensitivity pattern was determined in 100 pregnant women at term. Escherichia coli was the commonest organism isolated from these sites and gentamycin proved to be the most effective drug against these microbes.

Introduction

During pregnancy, many potential pathogens inhabit the vaginal vault (de Louvois *et al,* 1974) and endocervix (Goplerud *et al,* 1976). The relevance of the bacteriological studies to clinical practice has emerged simultaneously with the knowledge that the organisms which comprise the normal flora of the genital tract may also represent the major pathogens.

The flora exhibits a remarkable uncertainty in pregnancy because the vaginal microbial ecosystem seems to be dynamic and governed by various physiological factors including vaginal acidity and hormonal status (Solanki *et al,* 1983), oestrogens promoting colonisation of the bacteria while progesterone having antagonistic effect (Galask *et al,* 1976). The percentage of cultures positive for the cocci decreased as the pregnancy progressed (Goplerud *et al,* 1976).

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Accepted for publication on 8-8-85.

Material and Methods

One hundred pregnant women at term admitted to antenatal ward of Government Hospital for Women/Medical College, Amritsar were taken for study. Patients having any clinical vaginal infection or who were examined internally during the last 72 hours were excluded from the study. Under strict aseptic precautions the discharge from the vaginal fornices and the cervical canal was taken with swab sticks.

All specimens were immediately cultured on blood agar medium, MacConkey's medium and thioglycollate broth medium. They were incubated both aerobically and anaerobically at 37°C for 24-48 hours. For the isolation of fungi, specimens were cultured on Sabraud's medium and incubated at 22°C to 37°C for at least 7 days. Colonies were identified by their morphological, cultural and biochemical characteristics (Cruickshank, 1979). Group differentiation of Enterobacteriacea was done by biochemical tests described by Edwards and Ewing (1962).

The antibiotic sensitivity of organisms was determined against different antibiotics by the modified Stoke's disc diffusion method (Aggarwal, 1974). For the purpose of tests, nutrient agar plates (1.2 per cent) were used. Standard control strains used were E. coli (NCTC 10418), Staphylococcus aureus (NCTC 6571) and Pueudomonas aeruginosa (NCTC 10662).

Observations

The parity and the age group of subjects are shown in Table I.

TABLE I
Parity and Age

Parity	No. of cases	Range of age groups in years			
		<20	21-25	26-30	31-35
Primiparae	30	8	19	3	0
Multiparae	70	4	31	30	5

Out of 100 vaginal swabs, 26 positive cultures were obtained. Single organism was observed in 25, while mixed infection in I. The most frequent isolate was E. coli (8%) followed by Staphylococcus pyogenes (4%), Klebsiella pneumoniae and alpha haemolytic streptococci (3% each), Pseudomonas aeruginosa and Streptococcus faecalis (2% each) and Staphylococcus albus (1%). Candida albicans was isolated in 4% swabs.

Endocervical swabs showed 16 positive growths. Single organism was observed in 14, while mixed infection in 2. The most frequent isolate was Escherichia coli (8%) followed by alpha-haemolytic streptococci and Streptococcus faecalis (2% each), Klebsiella pneumoniae, Pseudomonas aeruginosa, Staphylococcus pyogenes and Staphylococcus albus (1% each. Candida albicans was isolated in 2%.

Sensitivity pattern of the isolates: 94.4 per cent of all the isolates were found sensitive to gentamycin which ranked best in the

TABLE II
Results of Bacteriological Study

Isolate	Vaginal swabs	Endocervical swabs
Escherichia coli	8	8
Klebsiella pneumoniae	3	1
Pseudomonas aeruginosa	2	1
Staphylococcus pyogenes	4	1
Alpha-haemolytic streptococci	3	2
Streptococcus faecalis	2	2
Staphylococcus albus	1	1
Candida albicans	4	2
Mixed growth	1	2
Total No. of positive swabs*	26	16

* The difference in total is due to growth of more than one organisms in cultures.

TABLE III
Sensitivity Pattern of the Isolates

Antibiotic	Vaginal isolates			Endocervial isolates			Overall sensitivity
	Tested	Sensitive	%ge sensitive	Tested	Sensitive	%age sensitive	
Ampicillin	21	14	66.6	15	10	66.6	66.6
Oxytetracycline	21	11	52.4	15	10	66.6	58.3
Cephalosporin	21	16	76.3	15	14	93.3	83.3
Gentamycin	21	19	90.5	15	15	100.0	94.4
Chloramphenicol	21	18	85.7	15	13	86.6	86.1
Streptomycin	21	18	85.7	15	12	80.0	83.3
Penicillin*	8	5	62.5	5	3	60.0	61.5
Erythromycin*	8	7	87.5	5	5	100.0	92.3

* for Gram positive micro-organisms only.

present series, followed by chloramphenicol (86.1%) cephalosporin and Streptomycin (83.3% each), Ampicillin (66.6%) and Oxytetracycline (58.3%). Amongst the Gram positive cocci which were subjected to antibiotic sensitivity with Penicillin and Erythromycin, 61.5% were sensitive to the former whereas 92.3% were sensitive to the latter.

Discussion

In this study, Escherichia coli was cultured most often from vaginal swabs (8%) which is in agreement with Goplerud *et al* (1976) and Krishna Menon *et al* (1982) who also reported E.coli as the most prevalent during pregnancy, while Sen *et al* (1976) and Solanki *et al* (1983) have reported Staphylococcus the most predominant followed by E. coli. However, Agarwal (1980) found E.coli in the vagina of only 2% of pregnant females while Mangala and Das (1974) found Gram negative Staphylococci in 8.1% in pregnant females.

In the present series the candida was isolated in 4% of patients in upper vagina which is almost similar to the reported incidence of candida infection in pregnancy of 5% (Aggarwal and Chawla, 1978), 5.7% (Gardner *et al*, 1957), but is lower than 12.9% (Sen *et al*, 1976) and 15.8% (Goplerud *et al*, 1976).

In our study of flora of cervix also, Escherichia coli was cultured most often (8%) which is consistent with the finding of Goplerud *et al* (1976). Streptococcus was found in 2% in present study which is close to the figures given by Gordon and Sbarra (1976) i.e. 2.2%, 2.5% and 1.9% during the first, second and third trimesters respectively. However, Hood *et al* (1961) describe 5.6% cervical carrier rate whereas Schauf and Hlaing (1976) report the incidence at 5-10 per cent.

Sensitivity pattern of the isolates: The overall sensitivity of the isolated organisms to gentamycin (94.4%) in this series is in agreement with Aggarwal and Chitkara (1973) who showed 93-99 per cent sensitivity of gentamycin against hospital strains of E. coli, Staph. pyogenes, proteus sp., Kl. aerogenes and Ps. aeruginosa, Chloramphenicol as the next best (86.1%) in present study is also close to 87.5% reported by Gupta (1978).

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