SUMMARY

Penetration of cervical mucus by a large number of sperms is essential to fertility. This necessitates both the proper deposition of normal semen and a salutary state of the cervical canal. The association of a normal semen with a poor post-coital invasion, is a cause of infertility in 5-8% of barren women, where other investigations of infertility do not show any abnormality as a cause.

Cervix is a factor in sterility because of the pathological changes in the physical characteristics and the chemistry of its mucus. Even clear, elastic, ovulatory cervical mucus may exhibit hostility.

The sialic acid (a glycoprotein) an important constituent of the cervical mucus responsible for the rigidity and coherence of the mucin molecule has been found applicable to many more conditions than the other tests of the cervical mucus.

The present attempt has been made on 60 patients and the clinical assessment of this cervical factor has been done in relation to its place in the investigation of an infertile female.

60 patients were chosen from the out-patients department of the N.L.S. Medical College Hospital from the
Department of Obstetrics and Gynaecology during the period August '88 to June '89. The women were clinically diagnosed as being infertile and with husband having normal fertility status. Patients were of known L.M.P. and regular menstrual cycles and not taking any contraception measure. A detailed history was taken and examination was done consisting of general, physical, systemic, P/S and P/V examinations.

10 patients of these with proved fertility were taken as controls.

Samples of mucus were collected in the ovulatory mid-cycle i.e. 15 + 2 days and the sample was collected from the endocervical canal with the help of an insulin syringe by repeated aspirations. Specimen was stored at -18°C unless the sialic acid analysis could be made.

Evaluation of the physical properties such as quantity, viscosity, spinnebarkeit, pH ferning and PCT was done along with the quantitative estimation of sialic acid (N-acetyl neuraminic acid) by the method of Aminoff 1959). N-acetyl neuraminic acid from E. coli, Sigma 98f anhydrous Mol. weight 3093 (N/a Sigma Chemicals, U.S.A.), obtained from the AILMS, New Delhi was used as standard.

The study of cervical mucus and its sialic acid content has been done by a very few authors in several cycles of the same patient and for several days of the same
menstrual cycle. In the present work, the mucus was studied mainly in the ovulatory phase of a 30 days cycle. Only 16 out of 60 patients could be studied in all the three phases.

Relationship of sialic acid to the various physical properties of the mucus and to the sperm penetration was determined. Further a correlation between the sialic acid and sperm penetration was determined. Sperm penetration was found to be higher with a lowering of sialic acid due to a lowering of viscosity of the mucus. This was also confirmed by Carlborg et al in 1968-69.

Sialic acid fall at ovulation was found to be associated with a decreased viscosity (Viergiver and Pommerenke, 1946), increased spinability (Carlborg et al, 1968), increased ferning (Carlborg, Mc Cormick and Gen Zell, 1968 and Moghissi and Marks, 1971) and increased amount (Symer, R.W., 1976). A similar relationship was seen in this study. No significant change in pH was detected with a change in sialic acid.

CONCLUSION

1. The cyclic alterations of the cervical mucus are responsible for the periodic receptivity or hostility of the hydrogel to sperm invasion.

2. The concentration of sialic acid decreases during the proliferative phase to reach a minimum at ovulation and this fall in the sialic acid is associated
with a positive sperm receptivity while in patients with no change in sialic acid no sperm receptivity was seen.

3. The average sialic acid as determined by the method of Aminoff, 1959 was 25.67 µg/ml of wet mucus at ovulation in fertile females and almost double i.e. 47.32 µg/ml in the infertile females.

4. Patients treated with estrogens (Ethinyl oestradiol) 0.01 mg daily from 9th to 15th day of menstrual cycle or 0.05 mg from 9th to 9th day of cycle showed a significant improvement in the quantity and quality and the post-coital invasion of the mucus by sperms.