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The human female genital tract appears to be an immunologically reactive tissue. Antibodies to a variety of microbial antigens have been observed in the secretions of the genital tract.

In recent years the analysis of the protein components of the cervical mucus besides the mucoid substance itself has become more and more interesting particularly with respect to fertility problems.

The human endocervix is lined with secretory columnar epithelium which produces mucus resembling the unboiled white of egg. Cervix secretes about 20-60 mg of mucus/day which increases to 700 mg/day during mid menstrual cycle of a women's reproductive life. The menstrual cycle has a profound effect on the nature and quality of the cervical secretions. Cervical mucus forms a network of macro-molecules of mucin made up of glyoprotein micromolecules arranged in long chains. This mucus network is filled with cervical plasma. The biochemical composition of the mucus comprises of water 85-90% and mucoids and mucins (25% amino acid chains 75% galactose) sialic acid, albumin, globulin, lipoprotein, immunoglobulin, lactoferrin and certain enzymes like alkaline phosphate, glucuronidase and
diastase, cholesterol, sodium chloride potassium and prostaglandin. Under oestrogenic stimulation, the glycoprotein network is arranged parallel to each other, thus helping in speram penetration. During ovulation at mid cycle the cervical mucus becomes copius, more elastic less viscous and less cellular while following ovulation during the progestogenic phase of the menstrual cycle, the glycoprotein network becomes more dense with interlacing bridges precluding sperm penetration.

The immunoglobulins in the cervical mucus originates by passive diffusion from the serum (Van Kaulla et al 1957) from the follicular fluid via the fallopian tube (Harwe et al 1965) or be produced locally in the cervix in response to a local antigenic stimulus from a gonococcal trichomonal or monilial genital tract infections (Chipperfield et al and Evans 1972). Hutcheson et al (1974) have incriminated local antibody in the aetiology of infertility.

The detection of secretory peice and lactoferrin in endocervical epithelium by immunofluorescence (Masson Hereman and Ferin 1968, Hulka and Omran 1969, Tourville e et al 1970) and the location of IgA and IgG containing plasma cells in the underlying stroma by the same method further add support to the local production of antibody
by the cervical mucus. This immunoglobulin production in the endocervical sub-mucosa might be considered as a mechanism required to prevent pathogenic invasion of the uterus and tubes.

Patients with abnormal cervical cytology had significantly raised immunoglobulin concentrations particularly IgA (Coughlan and Skinnar 1977), hence a prior status of immunoglobulin if known in normal women would help to diagnose earlier dysplastic changes in the cervix and could thus act as a prophylactic procedure in diagnosing the benign conditions which would progress into malignancy.

The relative and absolute concentrations of the immunoglobulin IgA and IgG in cervical mucus appear to vary in the different phases of menstrual cycle. Eslein (1970) studied the effect of progestogen on the protein of cervical mucus. At midcycle only albumin was present in most of the cases. Immunoglobulin and transferrin were normally not identifiable, shortly after ovulation transferrin and immunoglobulin reappeared in the mucus with immunoglobulins becoming quite prominent and diminishing towards the end of the luteal phase. Thus the progesterone influence on cervical mucus was manifest as an increase in the protein concentration. This
increase of immunoglobulin concentration may serve to
protect the early conceptus from potentially pathogenic
infections agents.

Maternofoetal immunologic relationship is a unique
phenomenon in the biologic world. Foetus is considered
as homograft transplant of living tissue between
genetically dissimilar members of the same species. The
success of conception as a graft has been attributed
to an integrated multifactorial system which maintain
a dynamic equilibrium throughout pregnancy. The foetus
and placenta containing paternally determined antigens
foreign to the mother in which they are developing, seem
to escape the immunoglobulin destruction and survive for
40 weeks with no evidence of rejection at birth.

The trophoblast which forms an operational interface
between mother and conceptus passes into maternal
circulation during normal pregnancy acting as a tissue
antigen. These antigens evoke the production of immu-
noglobulins IgM and IgG of which IgG crosses the
placental barrier. The placental barrier prevents the
massive transfer of lymphocytes and is responsible for
the protection of the foetus from maternal immunologic
attack.
Immunoglobulin (IgG) mainly develops in secondary response to antigen and it is the only antibody which is selectively transferred across the placenta, thereby giving a measure of protection to the newborn infant.

Immunoglobulin IgA does not cross the placenta and is synthesized by the foetus in small amounts. Immunoglobulin M (IgM) antibodies are first to be produced in primary responses and replaced subsequently by IgG antibodies. It is a macroglobulin and hence fails to cross the placenta. IgM present at birth is predominantly of foetal origin and it provides protection to the foetus from many pathogens.

In pregnancy the mean serum levels of IgG and IgM are significantly raised which suggests that immunization to foetal antigen stimulated the maturation of maternal immune system which is necessary to prevent the rejection of foetal allograft the value of IgG are highest in the first trimester and there is a gradual decrease in the second and third trimester. This fall in attributed to the passive transfer of IgG to foetus in its intrauterine life.

Thus the milieu of cervical secretion should be reflected by a change in the serum concentrations of the immunoglobulin IgG levels. Thus the changing IgG
levels in the cervical secretion and the deviations from normal might be suggestive of some mishap occurring with the mother or the foetus in utero and can be promptly managed.

Besides the cervix acting as a locally antigenic tissue also produces certain secretory immunoglobulin (IgA) which have their own protective influences on the female genital organ.

Pelvic inflammatory disease a common infection in women is having an increasing prevalence since 1960. The natural barrier to pelvic infection is the cervix where a downward flow of the mucus and the action of cilia are augmented by the production of a lysozyme. Aided by the presence of cervically secreted IgA the lysozyme hydrolyses the peptidoglycan links of microorganisms allowing osmotic destruction. This cervical barrier may be compromised after miscarriage, abortion, childbirth, cervical surgery and in the presence of a intrauterine contraceptive device. The immunoglobulins thus serving to protect the female genital organ from the dreaded pelvic inflammatory disease and the subsequent effect of the disease on the pregnancy outcome of a normal female.