

STUDY OF SECRETORY IMMUNOGLOBULINS IN CERVICAL SECRETIONS

by

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The secretory immunoglobulins in the cervix are thought to represent a first line of defence. The levels of immunoglobulins might change by infection or agents responsible for cancer cervix. The exact status of immunoglobulins if known in normal women at different phases of life, could help in detection of inapparent, atypical conditions like cancer of cervix.

Material and Methods

Material: One hundred women were included in this study. A group of 10 each were taken from 3 different phases of menstrual cycle, three trimesters of normal pregnancy and menopause. Whereas other 3 groups, each of 10 patients, were selected who were suffering from erosion, dysplasia and cancer cervix.

Method: The mucus from cervix was collected by a tuberculin syringe and its weight calculated. It was desolved in a known volume of normal saline. The specimen was stored at -20°C . The immunoglobulins were studied accounting to

Holbrow and Johnson technique (1973).

To detect the presence of immunoglobulin producing plasma cells, scrap smears were taken from endocervix by endometrial biopsy curette. Immediately the material obtained was immersed in an autoclaved bottle containing 2 cc of MEM solution.

A wet vaginal smear and a pap smear from cervix was taken in all patients.

Observations

Table I shows the total and mean values of IgA and IgG in three different phases of menstrual cycle. IgA and IgG values were least in mid cycle and maximum concentration reached towards the end of the cycle. The mean value of IgG is more than IgA in premenstrual phase being 114 mg% and 64.6 mg% respectively. The concentration of immunoglobulins varied in different cycles of the same woman when followed upto 3 cycles.

From Table I it can be seen that in the menopausal group the mean values of IgA and IgG was 67.8 mg% and 152 mg% with IgA:IgG ratio as 2.24 ± 8.84 . The values of IgA and IgG in pre and post menstrual phases of normal women were almost same as in menopause.

Table II includes women with normal pregnancy in 1st, 2nd and 3rd trimesters.

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TABLE I
Normal Menstrual Cycle and Menopause

	IgA		IgG	
	Values	Mean	Values	Mean
Post M.C.	0-155 mg%	26.7 mg%	0-200 mg%	55.1 mg%
Mid M.C.	0-32 mg%	6.3 mg%	0-60 mg%	11.5 mg%
Pre M.C.	6.5-132 mg%	64.6 mg%	1-253 mg%	114 mg%
Menopause	4-220 mg%	67.8 mg%	0-400 mg%	152 mg%

TABLE II
Values in Different Trimesters of Pregnancy

Trimester	IgA		IgG		IgA : IgG
	Values mg%	Mean mg%	Values mg%	Mean mg%	
Ist	5-72	22.2	0.80	47.2	2.36 ± 2.56
IInd	16-144	38.4	0-204	83.6	2.17 ± 2.19
IIIrd	1-160	48.6	0-164	73.8	1.5 ± 5.27

It is observed that values of IgA and IgG were low when compared with the values of premenstrual phase. The ratio of IgG: IgA was found to be decreased in 2nd trimester as compared to 1st and 2nd trimester.

In pathological conditions of cervix like erosion, dysplasia and cancer cervix, some of the women were menstruating while others had already attained menopause. This selection of the patients was made with a view to compare the levels of immunoglobulin of these patients with that of the women with normal cervical cytology.

It is observed from Table III that IgA level varied in erosion, from 10 mg% to

100 mg% and that of IgG from 100 to 360 mg%. This shows that the values of both immunoglobulins were raised as compared to normal women and especially IgG level was significantly increased. In cervical dysplasia, levels of both immunoglobulins were higher and IgG was significantly increased. In the cancer cervix the values were higher and more increase was observed in IgG.

Discussion

In the present study IgG and IgA were detected in most of the cervical mucus samples at all stages of menstrual cycle. Concentration of IgG were more than that of IgA. The values of immunoglobulins IgA and IgG were found low in mid cycle. This is consistent with the findings of Elestein (1970). They have also reported a mid cycle minimum in immunoglobulin levels though Coughlan and Skinner (1977) found no significant change in immunoglobulin levels in mid cycle. The decrease in immunoglobulin levels in mid

TABLE III
Values of IgA & IgG in Pathological Conditions of Cervix

	IgA (mg%)	IgG (mg%)
Erosion cervix	10-100	100-300
Dysplasia cervix	50-500	92-420
Cancer cervix	40-120	216-600

cycle could be because of increase in water content of cervical secretions. However, the difference between the minimum concentration are often very high. Therefore simple dilution and concentration can not be the only factor as very well commented by Schumacher (1973).

The levels of IgA and IgG showed an increase towards the end of the menstrual cycle. IgA increased from 26.7 mg% at post menstrual period to 64.6 mg% at premenstrual phase. Similarly, IgG increased from 59.1 mg% at post menstrual phase to 114 mg% at premenstrual phase. There was a significant fall in IgG:IgA ratio from 3.6 at post to 2.1 at premenstrual phase. This indicates that IgA level increased more than that of IgG. Coughlan and Skinner (1971) also reported increase of IgA and IgG with fall in IgG:IgA ratio before menstruation. These changes in the levels of immunoglobulin during the menstrual cycle could be due to the action of hormones on cervical mucus. Schumacher (1973) has proved that oestrogen endogenously produced or exogenously administered cause a decrease in the concentration of immunoglobulins, whereas progesterone increases the concentration of immunoglobulins in cervical mucus. It is difficult to explain these hormonal effects until we know more about the site of secretion and biosynthesis of these proteins and about the mode of hormonal action of the protein producing or releasing system in the cervical canal. In general, an intimate relationship is known to exist between the endocrine and immunoglobulin system (Wolstenholme and Knight, 1970; Pierpaoli and Sorkin, 1968) and more especially sex hormones have profound effects upon immunoglobulin responses. However, the biological significance of these changes is a matter of speculation in most

instances and is not clear. It is seen that there are large variations in absolute and relative values and also cyclical changes in immunoglobulin levels from different women in different studies. These discrepancies can be due to different genetic constitution of various people or different techniques used.

The levels of immunoglobulins in cervical mucus of normal and pregnant women were found to be low as compared to that of premenstrual cycle of normal women. There is a significant fall in IgG:IgA ratio of 1.5 in IIIrd trimester from 2.36 at 1st trimester. Waldman *et al* (1972) have also reported low values of immunoglobulin during pregnancy. Amino *et al* (1978) found serum IgA and IgG decrease during pregnancy and their values increased after delivery which they think is due to the immunoglobulin suppression.

In menopausal women mean values of IgA was to be $67.8 \pm$ mg% and of IgG was recorded as 152 mg%. Ratio of IgG:IgA was 2.24 ± 8.84 . There was no significant change when the average values of cervical mucus immunoglobulin of post menopausal group were compared with the mean values of menstrual cycle. Jalant and Isliker (1977) have also reported that there is no change in the levels of immunoglobulin in post menopausal women with that of menstrual cycle. It is concluded that probably age does not influence the concentration of immunoglobulin in cervical secretions.

The values of IgA and IgG were found high in patients with erosion, dysplasia and cancer cervix when compared with normal women. To prove that the increase in immunoglobulin was due to local production in cervix and not derived from blood, C₃ & C₄ albumin and transferin were estimated in cervical mucus of

patients with dysplasia and cancer cervix. Therefore, the increase in the cervical mucus immunoglobulin in patients of abnormal cervical cytology is not due to the presence of blood. In our study, IgG was found to be significantly increased in patients of erosion, dysplasia and cancer cervix.

Summary and Conclusion

A total of 100 cases were studied. The IgA and IgG immunoglobulin levels were estimated in different phases of menstruation, three trimesters of pregnancy, menopause and in certain pathological conditions of cervix.

It is concluded that the determination of immunoglobulin levels can help to diagnose the earlier changes in the cervix and thus can act as a prophylactic procedure in diagnosing the benign condition which might progress into malignancy. Thereby it can help in proper management of case.

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