

CHANGES IN THE CERVICAL MUCUS PATTERN IN WOMEN ON ORAL CONTRACEPTIVES & INTRAUTERINE CONTRACEPTIVE DEVICE

by

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Introrduction

Cervical mucus is a biological product of mixed origin and complex in nature. The physical characteristics of cervical mucus have been shown to vary day to day in the intramenstrual period and run parallel to the changes in the ovarian function and oestrogen and progesterone balance which have been utilized to estimate the hormonal status of the women.

Oral contraceptives and I.U.C.D. in the family planning programme have an important role. Their mechanism and site of action have been extensively investigated but there is still controversy on the subject. The classical pills act by inhibition of ovulation by producing abnormal changes in the endometrium and by rendering the cervical mucus hostile for sperm penetration. The low dose continued progesterone pills do not inhibit ovulation and have minimal effects on the endometrium. They are believed to

extend their action on the cervical mucus.

In view of the important role played by cervical mucus in human fertility, there is controversy regarding the exact mechanism of action of oral pills and I.U.C.D. hence it was thought worth while to study in details changes in the cervical mucus in normal women in the intermenstrual period and in women taking contraceptive pills and using I.U.C.D.

Material and Method

The present study was carried out among 120 cases selected from the in-patient and out-patient department of U.I.S.E. Maternity Hospital, Kanpur during the period February 1975 to December 1975 including:

1. A control group of sterile women -- 10.
2. A control group of parous women of child bearing age — 10.
3. Women taking oral contraceptives for 1 year or more — 50.
4. Women using I.U.C.D. — 20.
5. Women who stopped taking oral pills for at least one month or more — 20.
6. Women who got the I.U.C.D. removed at least one month ago—10.

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Accepted for publication on 12-4-1978.

The women who were included in the present study had normal menstrual cycles without any local gynaecological problem. The cases were studied in different phases of menstrual cycle e.g. postmenstrual (8-10 days), ovulatory (12-16 days), and premenstrual (18-24 days). A detailed clinical history including menstrual history, obstetrical history, history of past illness and date of last delivery was recorded and thorough systemic and pelvic examinations were carried in all cases.

The women who were given oral contraceptives were of proved fertility, willing to take oral contraceptive for birth control, were intelligent enough to follow the instructions, had no systemic disease e.g. renal disease, hepatic disease, hypertension congestive heart failure, genital or breast malignancy, varicose veins, allergic disease or migraine. The cervical mucus was studied for:

(1) pH (reaction), (2) fern pattern, (3) spinnbarkeit phenomenon, (4) NaCl estimation of dry cervical mucus (by titration method of Schales and Schales 1941 as modified by Conway and Foeger).

Results

In 90% of cases pH reaction in sterile control and the women taking oral contraceptives was found to be alkaline in all the phases of menstrual cycle. In parous control, women who stopped taking oral contraceptives and women who stopped using I.U.C.D., it was found to be alkaline in 80% of cases in postmenstrual and ovulatory phases of menstrual cycle. In premenstrual phase it was acidic in 50% cases due to the effect of progesterone. The pH in women using I.U.C.D. was found to be acidic in 80% of the cases in all the three phases of menstrual cycle.

In sterile control, 90% of cases showed fern reaction in premenstrual phase as compared with parous control in whom 90% showed negative result in premenstrual phase. In women using oral contraceptive pills, 66-68% of cases showed no ferning, while 16-17% showed a typical ferning in all the three phases of menstrual cycle. In patients who stopped oral pills, 90% showed negative ferning in premenstrual phase. In women using I.U.C.D. and the women who stopped I.U.C.D., the fern pattern was found to be more or less same in all the phases of menstrual cycle.

NaCl content of dry cervical mucus had a cyclical variation with a maximum rise at the time of ovulation in parous control the mean being 33.00% as compared to the sterile control in whom mean was found to be 5.00% for the same period, meaning thereby that there is increase of NaCl content with ovulation. In women using oral contraceptives no change was found in NaCl content of dry cervical mucus at the time of ovulation and findings were same as that of sterile control. In women who stopped using oral contraceptives the NaCl content was found to be increased again at the time of ovulation with a mean value of 42.5G%, meaning thereby that changes are reversible. In women using I.U.C.D. and in those who stopped using I.U.C.D. the NaCl content at the time of ovulation was found to be 50.0G% as compared with 5.0G% found in sterile control group for the same period, meaning thereby that I.U.C.D. had no effect on NaCl content of dry cervical mucus.

The spinnbarkeit phenomenon was found to be increased at the time of ovulation with mean value of 10.80% cms in parous control as compared with 0.80 cms in sterile control for the same period. In

women using oral pills, the spinnbarkeit phenomenon ranged from 0.0 to 3.0 cms in all the phases of menstrual cycle with a mean value of 1.16 cms at the time of ovulation. In women who stopped using oral pills the findings were just the same as that of parous control with a mean value seen at the time of ovulation as 10.95 cms the mean of spinnbarkeit at the time of ovulation in parous control, women using I.U.C.D. and women who stopped using I.U.C.D. was found to be 10.80 cms, 8.0 cms and 10.90 cms respectively meaning thereby that there was no effect of I.U.C.D. on spinnbarkeit phenomenon.

Discussion

The reaction of the cervical mucus was alkaline in 90% of sterile control and women taking oral pills in all the phases of menstrual cycle. It was also found to be alkaline in post menstrual and ovulatory phase in 80% cases of parous control, women who stopped using I.U.C.D. and women who stopped using oral contraceptives as has been determined by Palmer and Marcille (1941). The alkaline reaction of cervical mucus is mandatory to the successful penetration of sperm. The reaction was acidic among the women using I.U.C.D. in all the phases of menstrual cycle as observed by Shaw (1971) as I.U.C.D. alters the pH of cervical mucus towards acidic side which is lethal for sperm penetration.

Fern pattern aborisation was visible in 90% of sterile control group in premenstrual phase as compared to 10% in parous control group. In women using oral contraceptive no ferning was seen except in 16-17% cases who showed atypical fern pattern in all the three phases of menstrual cycle. In those who stopped using oral pills, 95% showed negative ferning. Similar findings have been re-

ported by Holmes and Mandle (1962), Menon (1959), Roland (1968), Hafnawi (1973). No change in ferning was found in women using I.U.C.D. and in parous control in our study in accordance with Hafnawi (1975).

The phenomenon of spinnbarkeit was studied in the present work. It was found to be increased at the time of ovulation in parous control. It was low in women using oral contraceptives which again increased when women stopped using oral pills. No change in the spinnbarkeit phenomenon was found in women using I.U.C.D. as compared to parous control group while Hafnawi (1975) has reported that increased turbidity and decreased spinnbarkeit were present in the presence of Copper T. Device.

The NaCl content of dry cervical mucus in 80% of parous control women showed the range and mean as 20.40G% and 33.0G% during ovulatory phase. During post and and premenstrual phase mean was 0.10G% among the women taking oral pills 92% showed NaCl content in the range of 0.16G% during ovulatory phase, similar to the sterile control group. When the oral pills were discontinued the NaCl content of dry cervical mucus ranged 30.70G% with a mean value of 44.8G% during ovulatory phase as compared to 5.59G% for the same period in anovulatory cycle. Our findings were similar to Achari *et al* (1974). According to Singh and Bose (1973) concentration of NaCl did not alter during the various phases of menstrual cycle in women using oral contraceptives and are same as in sterile women. In our series, in the women using I.U.C.D., NaCl concentration in cervical mucus showed no change during the ovulatory phase.

Conclusion

1. I.U.C.D. alters the pH reaction of cervical mucus towards acidic side which is lethal for sperm penetration.

2. Negative fern pattern were found in women using oral contraceptives same as in parous control except in 16-17% cases showing atypical fern pattern use of I.U.C.D. showed no change in fern pattern.

3. The spinnbarkeit phenomenon was found to be low in women using oral pills which increased at the time of ovulation when oral pills were discontinued, meaning thereby that changes are reversible. I.U.C.D. showed no change in spinnbarkeit phenomenon.

4. The sodium chloride content of dry cervical mucus showed cyclical variation with a maximum rise at the time of ovulation. In the women using oral contraceptives the findings were similar to sterile control and when the oral pills were stopped the sodium chloride content

increased at the time of ovulation meaning thereby that the changes are reversible. No change was found in women using I.U.C.D.

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