

## CERVICAL FACTOR IN FERTILITY

by

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The fertility index for a couple is based on relative fertility of each partner. The cervical factor is a contributory cause in 10-25% of cases. Grant (1958), Noyes (1959), Seguy (1959) and Mazer & Israel (1951). Steinberg (1958) stated it to be a primary cause in one third to one half of the patients. The male factor is responsible in 30-40% of the cases (Israel 1967) which can be assessed by routine semen analysis and by the Sims-Huhner postcoital test.

### *Material and Methods*

One hundred cases of infertility attending the gynaecological Out Patients Department and Sterility Clinic were studied. A detailed clinical history was taken of both the husband and wife. General physical, systemic and internal examinations of the wife were done and semen examination of the husband was carried out in every case. One hundred and fifty postcoital tests were performed in 100 cases at the expected time of ovulation, calculated from the menstrual history. The test was performed between 2 to 10 hours following coitus with an

abstinence of at least four days. The test was done twice in 30 and thrice in 10 cases. Fern test and spinnbarkeit were done twice in the same cycle, once at midcycle and again in the premenstrual phase. The findings were correlated with each other and with the postcoital test. Cervical mucus was examined under the high power of the microscope for the presence of leucocytes at midcycle in every case.

### *Observations*

One hundred cases complaining of infertility were studied. Seventy (70%) complained of primary and 30 (30%) of secondary infertility. Semen examination was done in all the cases. It was found that 52 (52%) had good quality semen i.e. counts of 60 million or more with good motility i.e. more than 60%, 25 (25%) had passable quality i.e. counts between 20-60 million with 40-60% motility and 23 (23%) had subnormal semen i.e. counts less than 20 million with motility below 40%. 2% had complete azoospermia and one had impotency.

Postcoital examination showed that 13 (13%) cases had repeatedly negative postcoital test (no sperms in cervical mucus at all). Of these 10 were done twice and three thrice. Twenty-one (21%) had repeatedly poor P.C.T. (1-5 motile sperms/

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H.P.F.), 4 were done twice and two thrice. Thirty-four (34%) produced good P.C.T. (6-20 motile sperms/H.P.F.), four were done twice and one thrice. Six (6%) had excellent P.C.T. (more than 20 sperms per H.P.F.). Of these 2 were repeated. One was done twice and one thrice. In 34 cases of repeated negative and poor P.C.T., 23 (67.77%) cases were due to subnormal semen quality. In 11 cases or 32.3% of the P.C.T. were found to be negative or poor in spite of passable or good semen giving an incidence of the cervical factor as 11%. Six cases were treated with local broad spectrum and systemic antibiotics along with small doses of oestrogens. Of these 4 improved with disappearance of leucocytes and appearance of good fern formation.

Cervical mucus arborization test was done at mid-cycle. Out of 100 cases, 38 had strongly positive (+++) arborization i.e. whole of the dried mucus showed well developed fern, 45 had positive arborization (++) i.e. fern formation was at several places, 15 had slightly positive (+) i.e. arborization at few places and 2 had atypical fern.

The correlation between P.C.T. and ferning of cervical mucus at midcycle was studied. It was found that of 38% strongly positive (+++) fern test, 5 (13.16%) had poor P.C.T., 8 (21%) had fair P.C.T., 21 (55.3%) had good and 4 (10.5%) had excellent P.C.T. Of 45 (45%) positive (++) fern formation, 7 (15.5%) had negative, 10 (22.22%) had poor, 15 (33.3%) fair, 11 (24.5%) good and 2 (4.5%) had excellent P.C.T. Of 15 (15%) slightly positive (+) fern formation, 4 (26.67%) had negative, 6 (40%) had poor, 3 (20%) fair and 2 (13.3%) good P.C.T. Two cases of atypical ferning were associated with negative P.C.T.

Of 100 cases, 15 (15%) had spinnbarkeit of less than 5 cms., 55 (55%) bet-

ween 5—9 cms. and 30 (30%) were more than 10 cms.

The correlation between spinnbarkeit and P.C.T. was also studied. Of 15 (15%) cases having spinnbarkeit less than 5 cms., 8 (53.33%) were associated with negative, 3 (20%) with poor, 2 (13.3%) with fair and 2 (13.3%) with good P.C.T. Of 55 (55%) spinnbarkeit between 5-9 cms., 5 (9%) had negative P.C.T., 15 (27.27%) had poor, 15 (27.27%) fair, 18 (32.72%) good and 2 (3.63%) excellent P.C.T. Of 30 (30%) cases with spinnbarkeit of more than 10 cms., 3 (10%) had poor P.C.T., 9 (30%) fair, 14 (46.6%) good and 4 (13.3%) excellent P.C.T.

The correlation between spinnbarkeit formation and ferning at mid cycle was observed. It was seen that of 15 (15%) cases with spinnbarkeit less than 5 cms., 8 (53.3%) had positive (++) fern formation, 5 (33.3%) had slightly positive (+) and 2 (13.3%) atypical fern formation. Out of 55 (55%) cases with spinnbarkeit between 5-9 cms., 8 (14.54%) had strongly positive (+++), 37 (67.27%) had positive and 10 (18.1%) had slightly positive fern formation. All the 30 (30%) cases with spinnbarkeit of more than 10 cms. were associated with strongly positive (+++) fern formation.

It was found that out of 100 cases, 74 (74%) cases had 0-4 leucocytes/H.P.F., 10 (10%) had 4-10 leucocytes/H.P.F. and 16 (16%) had more than 10 leucocytes per high power field at mid cycle.

The correlation between postcoital test and leucocytes in the cervical mucus at the mid cycle showed that out of 74% patients showing occasional leucocytes, 6 (8.1%) had excellent, 32 (43.2%) had good, 21 (28.4%) fair, 9 (12.1%) poor and 6 (8.1%) had negative postcoital tests. Of the 10 patients having 4-10 pus cells/H.P.F., 1 (10%) had good, 2 (20%) fair,

5 (50%) poor and 2 (20%) had negative postcoital tests. Of 16 patients having fair number of leucocytes, 1 (6.2%) had good, 3 (18.7%) fair, 7 (43.7%) poor and 5 (31.2%) had negative postcoital tests.

Ten (10%) cases had cervical erosion or cervicitis, 20 (20%) had pus cells in wet smear, 2 (2%) had monilial infection and 8 (8%) had trichomonas infection. Twelve (12%) women conceived during the course of investigations. Of these 6 (50%) had good P.C.T., 5 (46.6%) had fair and one (8.33%) had poor P.C.T.

#### Discussion

In the present series, 100 cases of infertility have been studied, of whom 70 (70%) had primary and 30 (30%) secondary infertility. The 11% incidence of cervical factor, as found by semen analysis and P.C.T. findings is consistent with that of Grant (1958), Noyes (1959) and Seguy (1959), who have reported 10-25%, whereas Mazer & Israel (1951) and Steinberg (1958) found cervical factor in one third to one half of the patients.

In the present series it was found that the increase in number of sperm counts were associated with better P.C.T. This is in agreement with MacLeod (1959), Mor (1966) and Gibor *et al* (1969), whereas Glass & Mroueh (1967) did not find any direct correlation between increase in the number of sperms in P.C.T. and increasing sperm counts. Sobrero (1962) found that in 8 out of 47 patients, P.C.T. was negative in spite of passable semen quality which he explains could be due to incomplete vaginal penetration.

The presence of sperms in the cervical mucus within 2-10 hours after coitus shows that the sperms get into the cervical mucus and maintain their motility for a certain period of time. This is in agreement with Danezis *et al* (1962) who performed P.C.T. within 8 hours and Tyler

(1961) within 12 hours, whereas Glass & Mroueh (1967) performed P.C.T. after 16 hours and Gibor *et al* (1970) after 72 hours.

Fern formation is controlled by ovarian steroids and is best at midcycle (Papanicolaou, 1946), Davis and Abou-Shabannah (1958). The association between fern and P.C.T. showed that good fern formation enhanced sperm motility. This is in agreement with the findings of Lamer *et al* (1940), Seguy & Simmonet (1933) and Harvey and Jackson (1948) who believe that penetrability of cervical mucus is greatest during midcycle when the amount of mucus increases and viscosity diminishes due to increased level of oestrogens. Swyer (1956), however, pointed out that the extent of sperm invasion and sperm activity could not be correlated with the day of the cycle.

It was seen that spinnbarkeit of more than 10 cms was associated with greater number of good and excellent postcoital tests which is consistent with the findings of Tampion and Gibbon (1962) and Gibbon Mattner (1966), who postulated that molecular alignment of cervical mucus, most likely played an important role in sperm transport.

The correlation between fern and spinnbarkeit, showed that both properties go hand in hand and are maximal at the time of ovulation and good cervical mucus favours sperm penetration.

The occurrence of leucocytes in cervical mucus at mid cycle usually indicated endocervical infection which could diminish the receptivity of cervical mucus to spermatozoa (Sobrero and Macleod 1962). On correlating the number of leucocytes in the cervical mucus at mid-cycle with postcoital tests, it was found that a significant number of leucocytes were associated with a greater number

of negative or poor postcoital tests showing that endocervical infection was unfavourable to the spermatozoa and reduced the sperm penetration. The occurrence of leucocytes in cases of negative and poor P.C.T. is in agreement with the findings of Grant (1958) who found that 70% of negative P.C.T. were associated with a significant number of leucocytes.

The improvement in 4 (66.6%) out of 6 patients treated with antibiotics and small doses of oestrogens indicates that treatment may be effective in cases of poor cervical mucus. Steinberg (1958), Bergman (1959) and Grant (1960).

The occurrence of 11 (91.7%) pregnancies with good and fair P.C.T. indicates a higher pregnancy rate associated with better P.C.T. This is in agreement with MacLeod (1951) who stated that chances of fertility increase with the rising quality and motility of sperms, and with the results of Danezis *et al* (1962) who found that semen quality was generally higher in men whose wives conceived, whereas Buxton & Southam (1958) demonstrated the lack of correlation between sperm migration, poor mucus and pregnancy potential.

#### Summary and Conclusion

The incidence of cervical factor was 11%. One hundred and fifty P.C.Ts. were done in 100 cases. It was concluded that better semen quality was associated with better P.C.T. which in turn was associated with higher pregnancy rate and that there was a direct correlation between sperm migration and pregnancy potential. The treatment of poor cervical mucus with antibiotics and oestrogen is quite effective and that presence of leucocytes in cervical mucus precluded positive postcoital test.

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