

STUDY OF CERVICAL FACTOR IN CASES OF INFERTILITY

by

R. MITRA,* M.S., D.G.O.

and

P. R. ATAL,** M.D.

The problem of infertility has been engaging the attention of physicians from ancient times. It was known even then that the male was responsible for sterile marriages in 30-40% of the cases (Israel 1967), which can be assessed by routine semen analysis and by the Sims-Huhner post coital test. In the English translation of Sushruta Samhita the importance of healthy seminal fluid has been stated thus "A man is incapable of begetting children, whose seminal fluid was affected by the aggravated vayu, pittam or kaphan, emits a cadaverous smell or has acquired a clotted or shreddy character or which looks like pus or has become thin or smells like urine or stool requires purification." There are biblical accounts of testing the male for fertility by making him copulate with another woman. The cervical factor is also a contributory cause in 10-25% of the cases. Grant (1958), Noyes (1959), Seguy (1959) and Mazer and Israel (1951), Steinberg (1958) stated it to be a primary cause in one third to one half of the patients.

Material and Methods

One hundred and twenty-five cases of infertility attending the gynaecological out patient department of M. L. B.

*Reader in Obst. & Gyn.

**Professor of Pathology.

M.L.B. Medical College, Jhansi.

Received for publication on 22-10-73.

Medical College, Jhansi, were studied. A detailed clinical history of husband and wife were taken. General physical, systemic and gynaecological examinations were done and semen examination of the husband was carried out in every case. Two hundred and ten post coital tests were performed at the expected time of ovulation. The test was performed between 2-8 hours following coitus with an abstinence of at least 4-5 days. The test was done twice in 35 cases and thrice in 25 cases. In every case the cervical mucus was examined under the high power field for the presence of leucocyte at mid-cycle. Cervical arborization and spinnbarkeit were done twice in every cycle once a mid-cycle and once in the premenstrual phase.

Observations

One hundred and twenty-five cases of sterility were studied. Among them 85 were of primary sterility and 40 were of secondary sterility. Seminal fluid examination was done in all the cases. It was found that 65 (52%) had good quality semen with counts of 60 millions and more, with a motility of more than 60%. Forty-five (36%) had passable quality i.e. counts between 20-60 millions with a motility of 40-60% and 15 (12%) had less than 40% while 3 (2.4%) had complete azoospermia.

Post coital test was done in all the cases

and it showed that 32 (25.6%) had excellent post coital test (more than 20 sperms per H. P. F.). Forty-eight (38.4%) had good P.C.T. (6-20 motile sperms/H.P.F.). Among them it was repeated twice in 5 and thrice in one. Twenty-eight (22.4%) had poor P. C. T. (2-5 motile sperms per H. P. F.) and it was repeated twice in 15 and thrice in 3 cases. Seventeen (13.6%) had repeatedly negative post coital test. It was repeated twice in 10 cases and thrice in 4 cases. In 45 cases of repeated negative and poor P. C. T., 30 (66.66%) cases were due to subnormal semen quality. In 15 (33.3%) the P. C. T. were found to be negative in spite of good semen or of passable quality, giving an incidence of 12% for the cervical factor. Nine cases were treated with local vaginal douches and broad spectrum vaginal pessaries, along with systemic antibiotic and small doses of ethinyl oestradiol. Seven cases improved with appearance of fern pattern and disappearance of leucocytes in cervical mucus.

Cervical mucus arborization was performed in all the cases. One at mid cycle and another was during the premenstrual phase. Forty-eight (38.5%) had strongly positive fern pattern, 55 (44%) had positive, 19 (15.2%) had slightly positive fern pattern which was scattered at few places and 3 (2.4) had atypical fern pattern.

Spinnbarkeit was studied in all these cases. Forty-four showed more than 10 cms., 64 (51.2%) between 5 and 9 cms. and 17 (13.6%) had less than 5 cms.

The correlation between the cervical mucus arborization and post coital test was studied at the expected time of ovulation. It was found that 45 (38.4%) had strongly positive fern test. Among them 8 (17.7%) had excellent P. C. T., 25 (55.5%) had good P. C. T., 8 (17.7%) had

fair P. C. T. and 6 (13.3%) had poor P. C. T. Of 55 (44%) positive fern pattern, 4 (7.27%) had excellent P. C. T., 18 had fair P. C. T., 13 (23.6%) had poor P. C. T. and 6 (10.9%) had negative P. C. T. Of 19 (15.2%) slightly positive fern pattern, 3 (15.8%) had good P. C. T., 4 (21%) had fair P. C. T. Three cases of atypical fern formation were associated with negative post coital test.

The correlation between post coital test and spinnbarkeit were studied. Of 44 cases who showed spinnbarkeit more than 10 cms. 7 (15.9%) had excellent P. C. T., 17 (38.6%) had good P. C. T., 18 (40.9%) had fair P. C. T. and 2 (4.5%) had poor P. C. T. Of 64 cases who showed spinnbarkeit between 5 and 9 cms., 4 (6.25%) had excellent P. C. T., 22 (34.35%) had good, 19 (29.6%) had fair, 17 (26.5%) had poor and 2 (3.1%) had negative P. C. T. Of 17 cases having spinnbarkeit less than 5 cms. 3 (17.6%) were associated with good P. C. T., 2 (11.9%) with fair 2 (11.9%) with poor, and 10 (58.8%) with negative P. C. T.

The correlation between spinnbarkeit formation and fern pattern at the expected time of ovulation were studied. Forty-four cases who showed spinnbarkeit of more than 10 cms. were associated with strongly positive fern formation. Of the 64 cases who showed spinnbarkeit between 5 and 9 cms., 4 (6.25%) had strongly positive, 42 (65.6%) had positive and 18 (28.1%) had slightly positive fern formation. Of the 17 cases with spinnbarkeit less than 5 cms., 13 (76.4%) had positive fern formation, 1 (5.8%) had slightly positive and 3 (17.4%) had atypical fern formation.

Presence of leucocytes in the cervical smear during the mid menstrual cycle was also studied and it was found that 86 (68.8%) had 0-4 leucocytes, 16

(12.8%) had 4-10 leucocytes and 23 (18.4%) had more than 10 leucocytes per high power field.

On examination of these cases it was found that 20 (16%) had cervical erosion and cervicitis, 25 (20%) had pus cells in wet smear, 12 (9.6%) had trichomonas infection and 4 (3.2%) had monilial infection. Twenty cases (16%) conceived while undergoing investigations.

Discussion

In the present series, 125 cases of sterility were studied. Among them, 85 were of primary and 40 were of secondary sterility. The cervical factor was present only in 12% of the cases as found by post coital examination and semen analysis. It corresponded with the findings reported by Grant (1958), Noyes (1959), Seguy (1959) and Jain *et al* (1973) who have reported 10-25%, whereas Mazer and Israel (1951) and Steinberg (1958) found that cervical factor was responsible in one half to one third of the patients.

In the present study it was found that better sperm counts showed better P. C. T. This is in agreement with the findings reported by Macleod (1959), Mor (1966), Gibor *et al* (1969) and Jain *et al* 1973; while Glass and Mrouch (1967) did not find any correlation between increase in the number of sperm in post coital examination 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 2-8 hours after coitus show their penetrability and their motility for some time. This is also reported by Danezis *et al*, (1962) who performed P. C. T. within 8 hours and Tyler (1961), Jain *et*

al, (1973) within 12 hours, whereas Glass and Mrouch (1967) performed P. C. T. after 16 hours and Gibor *et al* (1970) after 72 hours.

The correlation between fern and P. C. T. showed that good fern formation increases the sperm motility. This is in agreement with the findings of Lamer *et al*, (1940), Seguy and Simmonet (1933), Harvey and Jackson (1948) and Jain *et al* (1973) who believe that penetrability of cervical mucus is greatest during the mid cycle. Swyer (1956) reported that the extent of sperm invasion and sperm activity could not be correlated with the day of menstrual cycle.

In the present study, correlation between the post coital examination and spinnbarkeit showed that where the spinnbarkeit was more than 10 cms. it was associated with greater number of excellent and good post coital test, which corresponds with the findings reported by Tampion and Gibbon (1962) and Gibbon and Mattner (1966).

The correlation between spinnbarkeit and fern pattern showed the maximum activity at the time of ovulation and good cervical mucus favours sperm penetration.

The presence of leucocytes in cervical mucus during mid menstrual cycle indicated endocervical infection, which resulted in decrease receptivity of cervical mucus to spermatozoa as reported by Sobrero and Macleod (1962).

The maximum cases who showed negative or poor post coital tests were associated with large number of leucocytes during mid menstrual period.

The improvement in 7 among 9 cases treated with antibiotic, vaginal douches, broad spectrum vaginal pessaries and small doses of oestrogen indicates that above type of treatment may be effective

in cases of poor cervical mucus. Steinberg (1958), Bergman (1959), Grant (1960) and Jain *et al* (1973).

In the present study 20 women became pregnant with good and fair P. C. T. This is in agreement with Macleod (1951). Danezis *et al* (1962) and Jain *et al* (1973) also reported higher incidence of pregnancy, among those husbands whose semen showed higher counts, whereas Buxton and Southam (1958) demonstrated the lack of correlation between sperm migration, poor mucus and pregnancy potential.

Summary

One hundred and twenty-five cases of primary and secondary sterility were studied.

Two hundred and ten post coital tests were done during the mid menstrual cycle.

It was found that better semen quality was associated with better P. C. T. which resulted in higher pregnancy rate. There was a direct correlation between sperm migration and pregnancy potential.

References

1. Bishagranta, K. L.: Sushruta Somhita, 2: 122, 1911.
2. Buxton, C. L. and Southam, A. L.: Human infertility p. 184, 1958.
3. Bergman, P.: Acta. Obst. & Gynec. Scand., 38 (Supp. I): 9, 1959.
4. Danezis, J., Sujan, S. and Sobrero, A. J.: Fertil and Steril., 13: 529, 1962.
5. Gibbon, R. A. and Mattner, P.: Internat. J. Fertil., 11: 366, 1966.
6. Gibor, et al.: Fertil and Steril., 20: 572, 1969.
7. Gibor, et al.: Fertil and Steril., 21: 20, 1970.
8. Glass, R. H. and Mrouch, A.: Fertil and Steril., 18: 314, 1967.
9. Grant, A.: Fertil and Steril., 9: 321, 1958.
10. Grant, A.: Fertil and Steril., 11: 1, 1960.
11. Huhner, M.: Sterility in Male & Female Robman, New York, 1913.
12. Israel, S. L.: Menstrual disorders and Sterility 5th Ed., 1967.
13. Jain, A., Dass, A. and Dhawan, S.: J. Obst. & Gynec. of India, 23: 232, 1973.
14. Lamer, et al.: Am. J. Physiol., 129: 234, 1940.
15. Macleod, J.: Proc. Sec. Stud. Fertil., 10: 41, 1959.
16. Macleod, J.: Fertil and Steril., 13: 184, 1962.
17. Mor, A.: In Ex-cerpta Medica Internat. Congress Sterility, 133, 1966.
18. Mazer, C. and Israel, S. L.: Diagnosis and treatment of menstrual disorders and sterility 3rd Ed. 1951.
19. Noyes, R. W.: Obst. & Gynec. Survey., 14: 785, 1959.
20. Noyes, R. W.: Fertil and Steril., 9: 288, 1958.
21. Seguy, J. and Cornu, M.: Semaine Hop Paris, 35: 83, 1959.
22. Seguy, J. and Simmonet, H.: Gynec. & Obst., 28: 657, 1933.
23. Sims, J. M.: Clinical notes of uterine surgery with special reference to the management of the steril condition, Wood, N.Y., 1969.
24. Sobrero, A. J.: Ann. N.Y. Acad. Sci., 97: 591, 1962.
25. Sobrero, A. J. and Macleod, J.: Fertil & Steril., 13: 184, 1962.
26. Steinberg, W.: Fertil & Steril., 9: 436, 1958.
27. Swyer, G. I. M.: Ann. Obst. & Gynec., 78: 43, 1956.
28. Tampion, D. and Gibbon, R. A.: Nature 194: 381, 1962.
29. Tyler, E. T.: in "Sterility" p. 103, 1961.