CHANGES IN THE COAGULATION AND FIBRINOLYTIC SYSTEMS IN FEMALES USING INTRAUTERINE CONTRACEPTIVE DEVICE

by

S. D. SHARMA,* M.D.

and

GURBACHAN SINGH,** M.D., M.R.C. Path. (Lond.)

Bleeding in the females, ranging from spotting to irregular or continuous bleeding, is fairly common after the insertion of intrauterine contraceptive device (Malkani *et al.* 1964; Lippes, 1965; and Singh *et al.* 1969), and the incidence has been given as 89%, 90% and 27%, respectively, in these reports. The precise nature of such bleeding is not known. The defect may be due to some local change in the endometrium (Chaudhury *et al.* 1967) or a generalised effect on the blood coagulation and/or fibrinolytic mechanism. In order to clarify the latter issue, the results of an investigation of the coagulation and fibrinolytic systems in the females using the Lippes loop—a much practised contraceptive device in our country, are reported in this communication. Such a study does not appear to have been done in the past.

Material and Methods

Fifty females between the ages of 25 to 40 years in whom Lippes loop was inserted and was in position for a period of 6 to 24 months, were included in the present study. The following tests were performed in each case :

1. Bleeding time (Modified Ivy *et al* 1935)
2. Coagulation time (Modified Lee and White, 1913)
3. Hess's capillary fragility test.
4. Prothrombin time and index (Quick, 1935)
5. Platelet count — Plasma method (Dacie, 1963)
6. Plasma recalcification time (Dacie, 1963)
7. Clot retraction — Plasma method (Dacie, 1963)
8. Thromboplastin generation test (Hicks and Pitney, 1957)
9. Detailed thromboplastin generation test (Biggs and Douglas, 1953). This test was performed only when abnormal results were obtained in the preceding test.

Fibrinolytic activity was assessed by following tests;

1. Euglobulin lysis time (Kowalski *et al.* 1959)
2. Dilute blood clot lysis time (Sharma, 1969).

The above tests were performed in fifty normal women between the ages of 25 to 40 years, to act as controls.

Bleeding time in the controls ranged between 200 and 390 seconds with a mean value of 310 (SD 54.2); while the range

(From Pathology Department, Dayanand Medical College, Ludhiana).

**Assistant Research Officer; presently: Consulting Physician, Ahluwalia Street, Miller Ganj, Ludhiana-3.*

***Professor of Pathology.*

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in the test group was from 240 to 450 seconds with a mean of 320 (SD 38.8). However, the difference was not statistically significant.

Coagulation time in the controls varied between 360 and 600 seconds with a mean of 470 (SD 64.6); while the range in the other group was from 390 to 720 seconds with a mean of 560 (SD 70.3). The difference between the two groups was statistically significant (P. 0.05).

Hess's capillary fragility test was negative in normal females and positive in 10 out of 50 women with loop.

Prothrombin time and index were within the normal limits in both groups. Prothrombin time being from 12 to 17 seconds; while prothrombin index had a mean value of 98.8% (SD 3.1) in controls and 97.9% (SD 2.8) in females having loop.

Platelet count ranged between 175,000 and 350,000/c.mm. in controls with a mean of 256,000/c.mm. (SD 52,300). In the other group the range was between 150,000 to 340,000/c.mm., with a mean of 252,000/c.mm. (SD 51,400); thus giving a 'p' value of 0.8.

There was not much difference in the values of plasma recalcification time in the two groups; the range being between 90 and 250 seconds, with a mean of 180 (SD 45.8) and 190 (SD 33.6) in the control and test groups respectively.

Clot retraction varied between 40 and 65% in controls with a mean of 55.6 (SD 6.2); while the range in test group was from 33 to 66% with a mean of 44.3 (SD 6.4), thus giving a 'p' value of 0.05; out of these, 8 (16%) had a clot retraction of less than 40% (the lower limit of the normal).

Thromboplastin generation after the 8th minute in the controls revealed a range of 70 to 110% with a mean of 92% (SD 8.6); the corresponding range in the test group was between 60 and 100% with a mean of 84 (SD 6.9); thus giving a 'p' value of 0.05.

In the patients in whom thromboplastin generation was less than 70%, detailed thromboplastin studies were carried out substituting patients' platelets for normal platelets and the values after the 8th minute of incubation ranged between 60 and 100%. Out of these 10 patients only 5 showed values less than 75% (which is the lower limit of the normal range).

Euglobulin lysis time in the controls ranged between 100 and 250 minutes with a mean 175.6 (SD 33.8). The range in the test group was from 100 to 230 minutes with the mean figure of 170.8 (SD 0.5), thus giving a 'p' value of 0.5.

Dilute blood clot lysis time range between 180 and 360 minutes with a mean value of 240 (SD 40.4) in the controls; while the range in the test group varied between 180 and 390 minutes with a mean of 245 (SD 42.6), thus giving a 'p' value of 0.6.

Discussion

As can be seen from the results of the tests of the coagulation and fibrinolytic mechanisms, there was no significant difference among the values of bleeding time, prothrombin time and index, platelet count, plasma recalcification time, euglobulin lysis time and dilute blood clot lysis time.

Out of the other tests, 10 cases (having a positive Hess test) and including the 8 showing poor clot retraction, also had defective thromboplastin generation. The detailed thromboplastin generation studies in these cases showed a qualitative platelet defect in half the number of cases i.e. five out of ten cases. In other words, it means that there was increased capillary wall fragility in 20% and a qualitative platelet defect in 10% of the cases

out of a total of 50 females having loop insertion for a period varying from 6 to 24 months.

It would appear that besides a qualitative platelet defect in a minor percentage of cases, there must be some other cause (may be a local factor as suggested by Chaudhury *et al*, 1967) for the excessive menstrual bleeding in females after loop insertion.

Summary

Detailed coagulation and fibrinolytic studies were carried out in 50 females, 25 to 40 years of age and with a history of loop insertion for a period of 6 to 24 months. The results obtained were compared with those in 50 normal women of a similar age distribution.

An increased capillary wall fragility was observed in 20% and a qualitative platelet defect in 10% of the cases.

No abnormal fibrinolysis was observed in the women with loop insertion.

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