

EXAMINATION OF SOME HAEMATOLOGIC AND BIOCHEMICAL INDICES IN WOMEN TAKING HORMONAL CONTRACEPTIVE OR USING AN INTRA-UTERINE DEVICES*

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ABSTRACT A total number of 124 women of childbearing age attending a family planning clinic in Teheran were investigated for the effects of contraceptive steroids and the intra-uterine device on their Haemoglobin concentration, packed cell volume, Serum Iron and Serum TIBC.

A total of 42 women were used as control group. of 42 women who were fitted with an intra-uterine device, 17 were studied for changes in their blood picture for the first 6 months after insertion and 24 for 6 months — 2 years of use. There was a drop in their mean Hb concentration from 14.2 gm to 12.6 gm (the difference observed is statistically significant), with changes in PCV, Serum Iron and TIBC suggesting some degree of Iron deficiency

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anaemia. In Communities where levels of Hb tend to be lower than those of the present study, continued use of IUD may precipitate severe degrees of Iron deficiency anaemia.

Forty-one women were studied for effects of hormonal contraceptives on their blood picture for the first 6 months and for 6 months — 2 years of use. There was a slight rise of the mean Hb from 14.1 to 14.3, although elevation of the mean PCV was more marked, from 35.2 to 37.5. There was a marked elevation of Serum TIBC reaching levels higher than the normal 506.6 after 6 months of use (the difference observed is statistically significant), with some elevation in Serum Iron. These changes cannot be due solely to a diminished blood flow. These changes may be due to the combined effects of estrogens and progesterones in increasing the red cell volume and the balance of Iron between extracellular fluid and Iron stores. Therefore, contraceptive pill should not be recommended for the sole reason of improving the haemoglobin levels of a community.

INTRODUCTION

A large number of women of child bearing age in this country suffer from some degree of anaemia. A survey carried out in Isafahan, Yazd, and surrounding villages, shows that the mean haemoglobin concentration among these women is around 12.6 gm in Yazd and 11.7 gm in Isfahan (1) (WHO's figure for presence of anaemia when the HB value is less than 12 gm). (2)

This anaemia is contributed to by blood loss during the menstrual cycle, repeated pregnancies and deficiency of Iron in their diet.

The two methods of contraceptives currently used by many of these women are the intra-uterine device and contraceptive steroids. Both alter menstrual blood flow, Hormonal contraceptives decreasing it and the intra-uterine device increasing it. These are likely to lead to some changes in their blood picture the pattern and incidence of anaemia, and hence success of these methods and the advisability of their recommendation.

The present study deals with the effect of IUD and contraceptive steroids on HB,* PCV,** Serum Iron and TIBC.*** Burton *et al.* (3) have found slight changes in Hb and PCV values and a striking elevation of TIBC and Serum Iron after the use of oral contraceptives, while Alaghband-Zadeh *et al.* (4), have found a decrease in the levels of Hb among women who were fitted with IUD and an increase in the level of Hb among those

* Hb = Hemoglobin

** PCV = Packed cell volume

*** TIBC = Total Iron Binding Capacity of blood

taking contraceptive pills.

MATERIAL AND METHOD

A total of 124 women have been investigated. This research was carried out among some of the women who were already being investigated for a clinical trial of IUD and Hormonal contraceptive pill in a family planning clinic in Teheran.

A total of 840 women had attended the clinic during a period of 14 months, 124 who conformed with the following were placed on the study. (1) No history of recent blood loss, blood disorder or haemorrhoids. (2) No treatment for anaemia in the form of Iron tablets or Vit. B12 injection. (3) No pregnancy within the last 6 months. (4) No cardiac or endocrine disorder. Some of these women were breast feeding their children. (this factor was ignored). 42 women were attending the clinic for the first time and were selected as controls. 41 women were taking one of the following hormonal contraceptive preparations:

Lyndiol (Lynestrol & Mestranol)

Ovulen (Ethinoidal diacetate & Mestranol)

These were further sub divided into those women taking the pill one to six months and these for 6 months to two years.

Forty-two women had intra-uterine device inserted for them and were further sub divided into those who were fitted with the IUD for 1-6 months and those for 6 months to two years.

Blood samples were collected by a vacutainer in the morning with precaution against haemostasis.

Hb was determined by Cyanmethomoglobin method. (5)

PCV was determined by micromethod. (5)

Serum Iron and Serum TIBC were determined by: A one tube method.(6)

RESULTS

Effects of the Intra-uterine device: As shown in Table I the mean age and parity in this group were similar to that of the control group. The mean average age of women fitted with IUD was 27.6 (control 29.9) and the mean parity was 4.2 (control 5.2).

The mean haemoglobin concentration for IUD users for 1-6 months was 13 gm compared with the control group, 14.2 (a drop of 1.2 gm). The difference observed was statistically significant, and 12.6 after 6 months to 2 years (a total drop of 1.6 gm). The PVC also showed a significant decrease after 1-6 months of use (30.3% compared with the control 35.09% — a drop of 4.79%).

Table I. Mean age, Parity Hb, PCV etc of control and IUD users 0-6 months and 6 months - 2 years.

	No.	Mean Age	Mean Parity	Mean Hb	Mean PCV	Mean Serum Iron	Mean TIB
Control group	21	29.9	5.2	14.2	35.09	129.0	380.9
Women using IUD for 1-6 months	17	28.0	3.9	13.0	30.3	115.5	302.3
Women using IUD for 6 months-2 Years	24	27.1	4.9	12.6	33.7	90.6	341.7

There is also a drop in the mean Serum Iron of IUD users after 6 months to 2 years from 129 to 90.6 (a drop of 38.4 mg) with some changes in Serum TIBC suggesting anaemia.

Effects of contraceptive pills: As shown in table II the mean age and parity were similar to that of the control group. The average age of women taking contraceptive steroids was 27.2 (control 27.2) with a mean parity of 4.1 (that of control, 4).

The mean Hb level was elevated from 14.1 to 14.6 gm during the first 6 months of use but returned to 14.3 gm after 6 months to 2 years, showing a slight elevation. The PCV was elevated after 1 month — 6 months of use from 35.2 to 39.6 but then fell to 37.5, remaining somewhat elevated in comparison with the control group.

The mean Serum Iron is somewhat elevated after 6 months of use while the mean TIBC is markedly elevated after 1-6 months of use, the difference observed is statistically significant. Both of these figures have a tendency to drop after 6 months of use while continuing within the upper limits of normality.

DISCUSSION *IUD users:* From these figures it is seen that there is a fall of the haemoglobin level among women using an intra-uterine device. The results show a fall in Hb from 14.2 to 13 gm after 1-6 months of use of IUD and a further drop to 12.6 gm after 6 months — 2 years. The menstrual flow of IUD users increases considerably during the first 6 months, and after that there is a gradual fall in menstrual flow. Most women who continue with their IUD feel that they can cope with their increase menstrual flow even though their blood picture begins to show signs of anaemia. Eleven out of 24 women (nearly 50%) who were fitted with IUD had Hb's in the region of 11-12 gm. The fall in PVC is almost parallel with that of Hb. A drop of Serum Iron to 90.6 confirms that most of these women were suffering from some degree of Iron deficiency anaemia after 6 months - 2 years of use.

This drop in Hb level would be more significant among communities where the Hb concentration is lower than it was in this survey. In places such as Ref. 1, where the mean Hb is around 11.2, the continued use of IUD would make several women severely anaemic. Therefore, IUD insertion should be done with clinical or, if possible laboratory estimation of Hb. level of the women.

Contraceptive pill users: Generally, there is a reduction of menstrual flow in women taking the pill, although the rise in Hb. and PCV cannot be due solely to this factor. The results show that

Table II. The age, parity Hb, PCV, etc of control and women on Hormonal contraceptive 0-6 months to 2 years.

	No.	Mean Age	Mean Parity	Mean Hb	Mean Serum Iron	Mean TIBC	Mean PCV
Control group	21	27.2	4.1	14.1	124.9	377.3	35.2
Women taking pill for 1-6 months .	20	27.5	4.0	14.7	150.03	506.6	39.6
Women taking pill for 6 months-2 years	21	28.7	4.3	14.3	135.5	402.5	37.5

the mean Hb. level is slightly higher among those taking the pill, but there is a marked increase in PCV. It has been shown that in pregnancy there is a 16% increase of the red cell mass which is masked by the simultaneous rise of plasma volume. (7) It may be that the state of taking the pill and pregnancy, although very different, contribute to an increase of the red cell mass and some haemo concentration.

Serum Iron was elevated to the upper limits of normal while that of TIBC had reached higher limits than normal (506.6). The main causes of raised TIBC are Iron deficiency anaemia, pregnancy and hepatitis, and only in hepatitis is there an increase of Serum Iron. It has been suggested that the contraceptive pill produces some degree of hepatic dysfunction which may account for the significant rise in TIBC. Also Serum Iron increases as a response to both circulatory estrogens and progesterones, the balance of Iron in extracellular fluid and Iron in stores may be controlled by these hormones. With these changes, criterion for Iron deficiency anaemia among pill users must be modified.

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