Vet.Med.J.,Giza. Vol.42,No1.(1994):85-88

EFFECT OF ORAL CONTRACEPTIVE AGENTS AND INTRAUTRINE DEVICES ON HEMOGLOBIN AND SERUM IRON OF EGYTPIAN WOMEN

By

KOUT EL-KOLOUB A. HAMID* and NEFISA H. EL-BANNA**
* University of Ain Shams, Girls Collage, Dept. of Biochemistry and Nutrition.
** helwan University, Fac. of Home Economics, Dept. of Nutrition and Food Science.

(Received:12/12/1993).

SUMMARY

The effect of oral contraceptive agents (OCA) and intrauterine devices (IUD) on hemoglobin, serum iron and total iron binding capacity has been studied among women of low socioeconomic status attending maternal and child health centers (MCH).

The hemoglobin level did not differ significantly between women use contraceptive measures and those who did not adopting contraceptive. However higher percent of women used (IUD) shows lower level of hemoglobin. Serum iron and total iron binding capacity were found to be high among women taking OCA. While those women use IUD shows high total iron binding capcity and less serum iron than those who use OCA.

INTRODUCTION

Oral contraceptive agents (OCA) have been in use since 1956. the number of women using such preparation is enormously and continously increasing. Intrauterine devices (IUD), first described in 1909, are nearly used by 85 million women arround the world specially in China (Silver and Schmidt, 1987). However, more and more reports are appearing in the litrature indicated that OCA appear to associate with a number of metabolic changes (Novak, 1992). also women use IUD may experience more days of bleeding, persistent bleeding and even anemia.

The present study report the effect of OCA and IUD on the health of Egyptian women. It evaluates their effect on hemoglobin, serum iron and total iron binding capacity (TIBC) of adult women of low socioeconomic status, attending maternity and child health centers (MCH) in Saida Zienab and Helmia El-Gidida in Cairo area.

MATERIAL AND METHODS

A representative sample of women who used contraceptive agents and attending MCH centers in Saida Zienab & El-helmia El-gadida in Cairo area was investigated in this study. Most of these women use OCA and less women use IUD, therefore 199 females were randomly selected from those who use OCA and 25 females from those who use IUD. Thirty women who are not adopting contraceptive measures were used as a control group.

Ten millilites of venous blood were drown from each women of the different groups and used for the estimation of various constituents.A portion of each this sample was anticoagulated and used for determination of hemoglobin. the other portion was employed for serum separtion and assay of iron.

The cyanmethemoglobin procedure for determining hemoglobin content of whole blood was fallowed (Drabkin, 1949). Serum iron and total iron binding capacity (TIBC) were determined by the methods recomended by the Internation committee for the Standardization in hematology (1978).

Date of hemoglobin, serum iron and TIBC were analyzed statistically by analysis of variance according to Snedecor and Cohran (1969).

RESULTS

Table (1) shows the changes in hemoglobin content. The higher level was found among women who were not adopting contraceptive measures (12.58 ± 1.53 gm%) compared to those who used contraceptive agents (12.35 ± 1.93 {OCA} and 12.48 ± 1.97 gm% {IUD}). However, the differences in hemoglobin levels among the different groups were non significant.

The subjects using OCA and IUD were then subdivided into subgroups according to the time duration after starting use of the contraceptive measures (Table, 2) . The means of hemoglobin concentration for those using the pills for a period less than 12 months, were lower than the values for both corrosponding groups using IUD and the control group. However, the means of hemoglobin for those using pills for more than 12 months were increased.

In general, the mean of hemoglobin concentration was considered as an indication of anemia. However, as shown in Table (3) relatively high percentage of women take contraceptive pills for less than one year were with low hemoglobin concentration less than 11g%. Thise percentages were less thereafter. The opposite was noticed for IUD users.

Additional data were obtained by the determination of serum iron and total iron binding capacity (TIBC). Table (4) shows that the use of OCA is associated with an increase in serum iron concentraiton. The mean value for OCA consumers was 66.9mg. compared to 56.26µg% for the control group and 47.56 µg% for those using IUD.

Among women taking OCA, only 3.7% had serum iron below 40µg% compared to 32.2% of the control gorup.

Values of the TIBC (Table 4) are higher for both gorups adopting contraceptive measures than the values for the control group. However, the percent saturation decreased by consumption of OCA and using IUD.

Table 1: Hemoglobin of the women attending MCH centers - Cairo

Contraceptive Method	No. of cases	Hemoglobin conc. gm.%
OCA	199	12.35 ± 1.93
IUC	25	12.48 ± 1.97
Control	30	12.58 ± 1.53

Values expressed as means ± S.D.

Table 2: Mean hemoglobin concentration (gm %) for the subjects according to the duration of adoption of contraception.

Contrac. Method	<6 Months	6-12 Months	12-24 Months	<24 Months
OCA	12.08 ± 1.36	12.06 ± 1.48	12.97 ± 1.2	12.88 ± 0.29
IUC	12.44 ± 1.24	12.17 ± 1.17	12.63 ± 1.01	12.42 ± 1.03

Values expressed as means ± S.D.

Table 3: The precentage of women with low hemoglobin concentraiton less than 11.0 gm%.

Contrac. Method	<6 Months	6-12 Months	12-24 Months	<24 Months
OCA	17.6	16.7	10	10.6
IUC	-	-	20	11

Table 4: Serum iron & total iron binding capacity of the studied cases

Contrac. Method	Serum iron µg%	Serum iron µg%	Serum iron µg%
OCA	66.93±11	521±36	13
IUC	47.56±12	520±42	9
Control	56.25±12	320±43	18

Values expressed as means ± S.D.

DISCUSSION

Iron deficiency anemia is consider one of the public health problems of women in the child bearing period, specially among women of low socioeconomic status. The present study shows no significant change in hemoglobin concentration. However, the study did demonstrate that hemoglobin concentration was high in women recieving the pills for more than one year compared to those utilizing the intrautrine device as a contraceptive measure. This results is in agreement with Aly et al., 1975,Gaafer et al., 1983, Faiz 1985 and and Prasad et al., 1975, who were not able to find significant differance in hemoglobin levels between OCA takers and control gorup. Also this results is in accord with Smith et al. (1985) who showed that the use of OCA leads to an incease of hemoglobin.

Increase level of serum iron and TIBC, and decease of the percent of saturation as observed in this study, is consistant with the report of Parsad et al. (1975).

The mechanism by which IUD may cause such changes in iron status could be the more loss of menstrual blood in women who use IUD. However, the precise mechanism by which OCA could cause such changes remains unclear. Some of the changes are similar to those found during the middle and late stages of pregnancy Laurell (1987). The lower incidance of anemia among the pill takers could be correlated to the reduced menstrual loss experienced by the users of the OCA. This might not be the only mechanism. It has been pointed out that the absorption of iron seems to be related to the percent satutration of transferrin. The adminstration of oral contaceptives increase serum transferrin and TIBC to levels higher than those observed in iron-deficiency anemia. Even though iron levels are increased above normal, the percent saturation is less than that observed in the normal individual. The possibility therefore exists that this alteration in total iron binding capacity-serum iron relationship (% saturation) may have and effect on iron transport by the gut (Morgan and King, 1975).

Whatever the explaination may be, the combination of higher levels of serum iron and smaller loss menstural blood in women takig OCA than in those using other forms of contaceptive tools might make the development of iron definiency anemis less likely among this group.

REFERENCES

Aly , H.E. and Dakroury, A.M. (1975): Effect of oral contraceptive on iron concentration J. Egyptian Public Health Association.

Drabkin, D.H. (1949): The dysnfstlixsyion og hrmohlonin mrsdutrmrny. Smrt. J. Med. Sci. 95: 623.

Faizy, Ahmed, Baymi, M.Lyengav (1985): Absorbtion of iron. Amer. J. Clin. Nut. 28:606.

Fisch, I.R. and Freedman Sitl (1993): Treatment of anemia. Clin. Pharm. and Therapeutics, 14:245.

Gaafar, H. Tapizada, H.R. and Hussein A. (1983): Contraception. J. Egyptian Public Health Association.

International Committee for Standardization in Hematology. (1978): The measurement of total and unsaturated iron binding capacity in serum. Br. J. Haematol 20, 281-290.

Laurell, R.S. (1987): Factors effect on the blood composition, acta physiologica Scand. 14: suppl. No. 46.

Morgan, S. and King J. (1975): Effect of oral contraceptive agents on metabolism of some trace minerals. Am. J. Clin. Nut. 28:392.

Novak, L.P. (1992): Iron difficiency Nut. reviews. 30:39.

Prasad, A., Oberleas, D., Dei, K.Y., Moghissi and Stryker, J.C. (1975): Effect of oral contraceptive agents on nutrients I. minerals Am. J. Clin. Nut. 28: 377.

Silver I. and Schmidt R. (1987): A review: Contraception 36: 1:55.

Smith J., Gold Smith, and Lawrence (1985): Iron nutrition does not account for the hemoglobin differences between blacks and whites. J.D., Amer. J. Clin. Nut. 28:371.

Snedecor, G., W. and Cohran, W.G. (1969): Statistical methods sixth ecition.

Zadeh, J.A. Korabus, C.D. and fielding (1987): Malnutri... between females. J. Brit. Med. 4:708.