BLOOO GLUCOSE AND SERUM TRIGLYCERIDE LEVELS IN "NORMAL" WOMEN USING INTRAUTERINE CONTRACEPTIVE DEVICE

by

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There has been a continuing flow of research information during the past decade dealing with the effects of oral contraceptive steroids on carbohydrate and lipid metabolism (Spellacy, 1974). Several investigations have been made to improve these contraceptive agents by studies with the individual steroids to describe the effect of each one. Many of the reports have demonstrated that an alteration does occur in several of the measurable parameters of carbohydrate metabolism including elevation of blood glucose and plasma insulin levels (Spellacy *et al*, 1975). Currently, there is little information available describing the metabolic changes which normally occur during the first 6 to 9 months postpartum. Any spontaneously occurring metabolic changes could be falsely attributed to a "steroid contraceptive" if the drugs were investigated during that time period. The purpose of the present study was to obtain a control information by studying carbohydrate and lipid metabolisms in normal postpartum women using mechanical intrauterine contraceptive device (IUCD) for 6 months.

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Material and Methods

Thirty-five female volunteers were selected for the present study. They were at least four weeks postpartum and have not received any steroids atleast for three months. Height and weight were measured and they were questioned about other drugs being used, past obstetric history and family history of diabetes mellitus. All were instructed to eat high carbohydrate diet (250 gms) for 3 days before testing. After overnight fast blood sample was taken by venipuncture after giving gms. of glucose at 0', .5, 1hr., 2 hr. and 3 hr. intervals. Blood and triglyceriodes levels were measured corolimetrically.

After the completion of the control test, all the women were given a conventional non-medicated type of IUCD as their method of contraception. They were seen frequently and then brought back to the laboratory for an identical repeat test after 6 months.

Results

The mean age of the subjects was 26.3 ± 0.86 years. The mean control weight was 46.38 ± 1.8 kg and their 6 months test weight was 48.42 ± 1.6 kg. This represents a significant weight gain by 2 kg ($t = 3.562$: $p < .001$). Blood glucose for the two tests are shown in Table 1 and the mean values are plotted in Fig 1. There were 26 women who

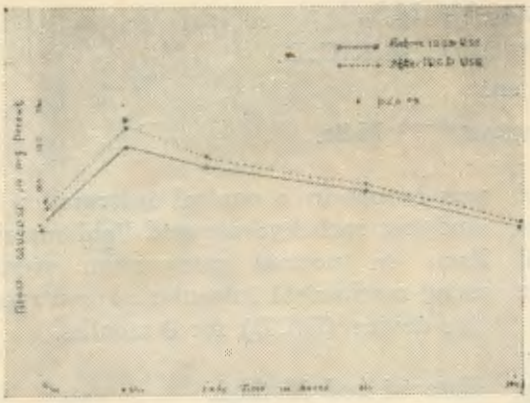

Fig. 1
Glucose tolerance test in 35 women before and after six months use of intrauterine contraceptive device.

had an increase in fasting blood glucose levels (FBS), 4 had no change and 5 had a decrease in FBS levels. It can be seen that, although there is a statistically significant elevation of both the fasting and ½ hour 6 month values, the amount of change between the two tests was small. There was no significant correlation between weight change and blood sugar changes.

The mean fasting serum triglyceride level before and after the 6 month test was 47.83 ± 3.58 mg and 48.64 ± 4.36 mg per 100 ml respectively and there was no significant change seen ($p > 0.5$).

Discussion

Many studies have been concerned

TABLE I

Glucose Tolerance Test in 35 Women Before and After 6 Months Use of Intra Uterine Contraceptive Device

	CONTROL TEST				AFTER 6 MONTHS TEST			
	Fasting	0.5 hr.	1.0 hr.	2.0 hr.	3.0 hr.	Fasting	0.5 hr.	1.0 hr	2.0 hr.	3.0 hr.
Mean	84.34	121.76	111.63	98.62	79.33	89.52	130.62	116.12	101.73	81.52
S.D.	6.92	16.67	14.48	12.63	7.42	7.32	18.41	15.16	12.86	8.53
Student T. test	2.1136	2.0615	0.8314	1.3251	0.6321					
p Value	0.05	0.05	NS	NS	NS					

NS indicates not significant.

with the effect of steroid contraceptives on carbohydrate and lipid metabolisms and often the population studied began their therapy during early postpartum period. In order to adequately assess the effect of these steroids it is necessary to know what spontaneous changes occur during that time. Only a few studies of carbohydrate metabolism in mechanical contraceptive users have been reported, frequently the authors do not state whether the subjects were postpartum. Posner *et al* (1967) noted no alteration in intravenous glucose test (IVGTT) in 14 women using IUCD's for an average period of 7 weeks. Goldmen and associates (1970) confirmed the finding of posner *et al* (1967) and they reported no glucose change at 3 month intervals in 26 healthy controls. Boshell *et al* (1968) performed oral glucose tolerance test in 15 control women and they reported that 9 had no glucose change during a 12 month period of retesting. Spellacy *et al* (1975) reported slight changes in fasting and 0.5 hour blood levels in 56 healthy controls at the 6 month test.

The purpose of the present study was to develop base line prospective data on the spontaneous changes which occur in carbohydrate metabolism during the postpartum period. These results could then be used as "control" information when evaluating the results obtained from prospective studies where steroid contraceptives were used postpartum. These data show that there are slight carbohydrate changes which occur in "Normal" postpartum women using IUCD. This suggests that the altered carbohydrate metabolic state of pregnancy is markedly reversed immediately postpartum and slowly returns towards a base line nonpregnant response during the next 6 months. These "Control" changes must therefore be subtracted from any results noted in steroid contraceptive studies conducted in the same time period. It is clear from a review of literature that the reported results of blood glucose changes in postpartum women using steroid contraceptives usually far exceed those noted in this IUCD "Control" group. This supports the general concept that certain contraceptive steroids can alter carbohydrate metabolism.

Summary

Glucose tolerance test and plasma triglycerides levels were studied in 35 normal women before and after 6 months use of intra-uterine contraceptive device (IUCD). It was found that there was a small but statistically significant ($p < 0.05$) elevation of the fasting and 0.5 hour blood glucose values at the 6 month test. There was no significant change seen in the serum triglyceride levels but there was a significant increase in body weight by 2 kg ($p < 0.001$). These data provide a further understanding of changing metabolic parameters associated with pregnancy and they also provide the 'control' baseline information for comparison with other post-partum studies on the metabolic effects of contraceptive steroids.

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