BLOOD HAEMOGLOBIN, TOTAL RBC AND CHOLESTEROL STUDIES DURING PREGNANCY*

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As far back as 1845, Bacquereb and Rodier (3) reported about the hyperlipemia occuring during pregnancy. In 1904, Capaldi (5) noted that the level of blood fats in dogs was almost doubled during the latter part of pregnancy as compared to non-pregnant animals. Though several workers (8,10,16,17) performed detailed studies on different lipid fractions of blood but no unanimity could be found regarding the occurence of hypercholestrolemia during pregnancy. Mullick *et al.* (15) conducted detailed studies on serun lipides of pregnant as well as of non-pregnant subjects belonging to different socio-economic strata. Present study has been undertaken to get an idea about the changes in the level of serum cholesterol during the various trimesters of pregnancy in Rajasthan where the diet is very poor in fats. Also haemoglobin and red cell count have been estimated to get an idea of the degree of anaemia present.

MATERIALS AND METHODS

The 45 subjects for this study were selected from the age group between 17 to 32 years taking 15 subjects from each of the three trimesters of pregnancy from amongst those attending the out-patient department of Obstetrics and Gynaecology, S.P. Medical College, Bikaner. The parity ranged all the way from primi to thirteen para, although the majority were between primi and fourth para. Similar studies were undertaken in non-pregnant healthy women of the same age group taken from the members of the hospital and the medical college staff who acted as controls. A preliminary clinical examination was conducted to exclude the presence of any systemic disease or any source of blood loss. None of the subjects or controls were taking any haematinics. The duration of pregnancy was calculated from the first day of the last menstrual period. First trimester was considered for the period upto 14 weeks, second upto 28 weeks and the third beyond 28 weeks of gestation.

Blood from the fasting subjects was withdrawn to estimate haemoglobin by Sahli's method, total RBC count haemocytometerically using improved Neubauer's counting chamber and serum cholesterol by the method as described by Hawk *et al.* (14).

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OBSERVATIONS AND RESULTS

The results are shown in table I. Haemoglobin as well as the total RBC count showed a significant fall during the first trimester of pregnancy and continued to remain almost to the same level until the end of pregnancy. Serum cholesterol, to the contrary, indicated a non-significant rise during the first trimester but a significant rise was noted during the second and third trimesters of pregnancy. No significant relation of these findings to the parity was however, obvious.

TABLE I

Haemoglobin, total RBC and cholesterol contents of blood in different groups of subjects

Estimations	*Normal non-pregnant controls*	*First trimester*	*Second trimester*	*Third trimester*
Hb	11.1±0.26	9.8±0.42	9.9±0.41	9.4±0.17
(gm %)	(9.8—15.2)	(5.8—12.4)	(7.0—13.0)	(8.6—10.4)
	t-value	2.5*	2.3*	5.0*
RBC	4.5±0.13	3.7±0.11	3.5±0.17	3.9±0.14
million/cmm	(3.5—5.6)	(2.9—4.4)	(2.4—5.2)	(3.2—5.0)
	t-value	4.4*	4.3*	2.5*
Cholesterol	180.6±4.12	181.0±8.71	209.3±7.65	247.8±9.61
gm %	(107 — 238)	(122 — 255)	(148 — 277)	(183 — 326)
	t-value	0.04	2.6*	5.5*

Number of subjects in each group was 15; Values are Mean±SE; figures in parentheses show range.
*Denoted significant t-value at 5% level.

DISCUSSION

Haemoglobin content of the blood in the controls has been slightly towards the lower side, possibly due to poor nutritional standards. During pregnancy it declined and the total red cells also indicated a fall. This drop in the red cell count and the haemoglobin percentage has also been noted by others (4, 6, 7, 9, 11, 18) and had been attributed to be due to physiological anaemia of pregnancy as a result of hydraemia.

Total blood cholesterol level showed a little rise though insignificant during the first trimester of pregnancy. It, however, showed persistently significantly elevated levels during the second and the third trimesters of pregnancy. Similar results for serum lipides have been described by Mullick *et al.* (15).

Green (12) noted a decrease in the concentration of serum total cholesterol during the first trimester and subsequently a progressive increase throughout the pregnancy. He also found that the hypercholestrolemia in late pregnancy could not be prevented even by hypocholesterolemic diet. However, in healthy females serum lipid levels and its fractions vary with the nutritional status of the iudividuals. Hansen *et al.* (13) studied 30

pregnant women and could not find and relation between their serum cholesterol and the diet during the third trimester.

The increase in serum cholesterol during the latter months of pregnancy seems to be due to the hormonal effects only as dietetic variations do not affect the blood lipides during pregnancy (12). Also it has been well known that hormones play important role in varying blood lipid fractions (1, 2).

SUMMARY

Blood haemoglobin, total RBC count and serum cholesterol levels in 15 non-pregnant, and in three groups each of 15 women during the three trimesters of pregnancy have been studied. Haemoglobin and RBC count decreased during the first trimester possibly due to apparent anaemia of pregnancy, while serum cholesterol increased during the second and third trimesters of pregnancy possibly due to variations in the hormonal level during pregnancy.

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