

A STUDY OF SERUM IMMUNOGLOBULIN IN PREGNANCY WITH HYPERTENSION AND TOXAEMIA

By

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SUMMARY

Ninety six pregnant women, 24 cases of normal pregnancy, 10 cases of pregnancy with essential hypertension, 34 cases of pregnancy with pre-eclamptic toxæmia, 24 cases of pregnancy with eclampsia and 4 cases of post-partum eclampsia were selected for study. Cases were selected from all the three trimesters of pregnancy. Serum IgG was estimated in all cases by single radial immunodiffusion method of Mancini *et al* (1965). Serum IgG shows a significant fall in pregnancy complicated with hypertension, Pre-eclamptic toxæmia and eclampsia from normal pregnancy.

Introduction

The importance of plasma proteins and the variation in its level during pregnancy have been studied since long, even before the beginning of 20th century.

Benster and Wood (1970), Nicholas *et al* (1973), Mc Ewan (1968) Horne *et al* (1970) and Jha and Pandey (1983) observed that there is a marked fall in the level of serum immunoglobulins during pregnancy, specially during third trimester.

The fall in the level of serum immunoglobulins is due to reduction in the level of serum IgG, because there is a selective transplacental passage of IgG from mother to the foetus. This fall is more marked when pregnancy is complicated with toxæmia, anaemia, hypertension or nephritis. In the present study, we have tried to study the effect of essential

hypertension, pre-eclamptic toxæmia and eclampsia on serum IgG.

Material and Methods

The cases for the present study were selected from the patients attending obstetric O.P.D. and the patients admitted in indoor wards of Nehru Chikitsalaya, B.R.D. Medical College, Gorakhpur. Ninety six patients were included in the present study. Out of these, 24 cases were of normal pregnancy without any complication. They were considered as control subjects. Ten patients were of essential hypertension, 34 patients of PET, 24 of eclampsia and 4 of post-partum eclampsia. Patients of pre-eclamptic toxæmia and eclampsia had their blood pressure ranging from, 140/90 mm Hg to 180/120 mm of Hg. They had either albuminuria or oedema feet or both. The patients of essential hypertension were either known cases of hypertension before pregnancy or were diagnosed in early

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pregnancy during first trimester. Case history of every patient was taken in detail. A detailed clinical examination was done. All routine investigations were carried out. This included Hb%, TLC, DLC, ABO grouping, Rh typing, V.D.R.L. complete urine examination with particular reference to albumin was done. B.P. was recorded in all the cases.

Quantitative determination of serum IgG was done by "Single Radial diffusion method" of Mancini *et al* (1965), using agar gel plate supplied by Hoechst India Limited. The test sample was put into a small antigen well. This on diffusion into the agar forms a ring of antigen-antibody precipitate around the wall. When the reaction has produced to equilibrium the diameter of precipitate rings were measured. Minimum diffusion time for IgG was 50 hours. The concentrations of IgG related to the measured diameter were studied directly from the reference table supplied by the manufacturers.

Observations

Maximum number of patients were 20-25 years of age. Fifty one patients were

multiparae and 45 were primigravidae.

TABLE I shows the serum IgG concentration in normal pregnancy in relation with different trimesters of pregnancy. This Table shows that there is a fall in the value of serum IgG in successive trimesters of normal pregnancy.

TABLE II shows the serum concentration of IgG in normal pregnancy and pregnancy complicated with essential hypertension. According to the above Table the mean serum IgG in pregnancy complicated with essential hypertension is considerably lower than normal pregnancy, although statistically not significant ($p > 0.05$).

TABLE III shows the serum concentration of IgG in normal pregnancy and pregnancy complicated with essential hypertension, pre-eclamptic toxæmia and eclampsia, in second trimester. It is evident from the above Table that the mean serum IgG is lower than that of normal pregnancy but not significant statistically ($p > 0.05$).

The value of serum IgG is significantly lower in pregnancy complicated with pre-eclampsia when compared with normal-

TABLE I
Serum IgG Concentration in Different Trimesters of Normal Pregnancy

Trimester	No. of cases	Mean IgG (mg/100 ml)	S.D.	Range	t.
First	5	1145.04	102.6	1008.8-1218.8	
Second	9	964.4	58.33	860.0-1060.0	4.26
Third	10	865.23	48.33	812.1-958.0	4.053

TABLE II
A Comparative Table Showing the Serum Concentration of IgG in Normal Pregnancy and Pregnancy Complicated by Essential Hypertension

Description	No. of cases	Mean IgG (mg/100 ml)	S.D.	Range	Value of t.
Normal Pregnancy	5	1145.04	102.6	1008.8-1218.8	
Hypertension	3	1009.3	50.35	958.3-1060.0	2.098

TABLE III

A Comparative Table Showing the Serum Concentration of IgG in Normal Pregnancy and Pregnancy Complicated with Essential Hypertension, Pre-eclamptic Toxaemia and Eclampsia, in Second Trimester

Description	No. of cases	Mean IgG (mg/100 ml)	S.D.	Range	Value of t.
Normal Pregnancy (a)	9	964.4	58.33	860.0-1060.0	Between a & b 0.229
Hypertension (b)	3	955.55	56.75	860.0-958.3	Between a & c 7.162
Pre-Eclampsia (c)	6	773.03	35.22	718.8-812.2	Between b & c 6.13

pregnancy ($p > 0.05$). The value of serum IgG in pregnancy with pre-eclamptic toxaemia was also significantly lower than that of hypertensive cases ($p < 0.05$).

TABLE IV shows the serum concentration of IgG in normal pregnancy and pregnancy complicated with essential hypertension, pre-eclamptic toxaemia and eclampsia in third trimester. As shown in the above Table, the value of IgG in hypertensive pregnancy is lower than that in normal pregnancy ($p > 0.05$).

The mean serum IgG concentration in pre-eclamptic toxaemia is much lower than that in normal pregnancy and is statistically significant also ($p < 0.05$).

The serum level of IgG in cases of eclampsia was found to be significantly

lower than that in normal pregnancy ($p < 0.05$).

Discussion

Effect of age: The present study shows that age has no significant effect upon the level of serum IgG ($p > 0.05$).

Effect of parity: We have found no significant change in the level of serum IgG with parity ($p > 0.05$).

Serum IgG in Normal Pregnancy: Benster and Wood (1970) noted a decrease in the concentration of all three immunoglobulins at 27th to 33rd weeks of normal pregnancy.

Maroulis *et al* (1971) found the serum IgG concentration to be 1068 mg/100 ml in first trimester, 1007 mg/100 ml in

TABLE IV

A Comparative Table Showing the Serum Concentration of IgG in Normal Pregnancy and Pregnancy Complicated with Essential Hypertension Pre-eclamptic Toxaemia and Eclampsia in Third Trimester

Description	No. of cases	Mean IgG (mg/100 ml)	S.D.	Range	Value of t.
Normal Pregnancy (a)	10	865.23	48.33	812.1-958.3	Between a & b 1.452
Hypertension (b)	4	824.3	45.5	765.0-860.0	Between a & c 7.452
Pre-eclampsia (c)	28	761.89	33.39	718.8-812.1	Between a & d 3.34
Eclampsia (d)	24	781.60	74.91	673.3-958.3	

second trimester and 943 mg/100 ml in third trimester, showing that the value of IgG decreases with the successive trimesters of pregnancy.

The mean serum IgG values obtained in the present study show a gradual reduction in the level of serum IgG with each successive trimester of pregnancy.

In the present study it is seen that the level of serum IgG was considerably lower in pregnancy complicated with hypertension when compared with that in normal pregnancy ($p > 0.5$).

The mean serum IgG values obtained by us were always lower in the hypertensive pregnant women when compared with normal pregnant group. But the level of IgG in hypertensive patients was always higher than the toxæmia group. In our studies, we find that the value of serum IgG is significantly lower than that of normal pregnancy for each trimester ($p < 0.05$).

The value of serum IgG found by us in the eclamptic group is significantly lower than the control group ($p < 0.05$).

Benster and Wood (1970) noted IgG level in hypertension to be 494 ± 187 mg/100 ml, it was lower when compared with that of normal pregnancy. Nicholas *et al* (1973) observed IgG concentration in hypertensive patients to be lower than that in normal pregnancy. Mc Gillivray

and Tovey (1957) found that serum gamma globulin levels were lower in toxæmia of pregnancy when compared with normal pregnancy. Mc Ewan (1968) Horns *et al* (1970, Studd *et al* (1971) all found a significantly lower levels of serum IgG in toxæmic pregnancy when compared with normal pregnancy. Jha and Pandey (1983) found a significant fall in the level of serum IgG in pregnancy complicated with hypertension and pre-eclamptic toxæmia. Our findings are in accordance with the findings of other workers.

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