

# ASSESSMENT OF IMMUNOCOMPETENCE IN CASES OF ABORTIONS

by

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## Introduction

Immunocompetence in man is not new and it is the immune mechanism in man, which has helped him to survive through the 20 million odd years of existence. But recently it is being reviewed with more interest, especially in clinical medicine. The implanted zygote containing foreign paternal antigen is seen to be successfully implanted into the uterus, without rejection, due to altered cellular immune response and production of a number of substances with immunosuppressive properties including HCG and alphafetoproteins. Keeping in mind an altered immunological basis of pregnancy, it is tempting to postulate that there may be some abnormality of the immunological responsiveness responsible for many cases of habitual and threatened abortion. The present work was therefore undertaken to study the immunocompetence in cases of abortions.

## Material and Methods

The study comprises of 20 cases of

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abortions, including 10 each of threatened and spontaneous ones, and 25 cases of normal first trimester pregnancy as control.

Detailed history, clinical examination and necessary routine investigations were done. The following is the account of special tests employed to assess immunocompetence in these cases.

(1) Peripheral lymphocyte count (PLC) was calculated with the help of total leucocyte count and differential lymphocyte count.

(2) T. lymphocyte studies (Jondel *et al*, 1972 with slight modification).

(3) ACTIVE T lymphocyte studies by high affinity E-Rosette (West *et al*, 1977).

(4) Immunoglobulins Assay by using tripartigen immunodiffusing plates—IgG, IgA, IgM (Mancini *et al*, 1965).

The results of various parameters for cellular and humoral immunity in cases of abortions were statistically analysed.

## Observation

The study of lymphocytes, including PLC, T Cell % and Total T. cell levels/cu mm, in cases of abortions were done and their findings were compared with control (Table I). The cases of Threatened abortion showed no significant change ( $P > 0.05$ ) in P.L.C. T Cell % and T Cell

levels. Whereas in cases of spontaneous abortion, P.L.C., T Cell % and T Cell level showed significant increase ( $P < 0.001$ ), when compared with normal first trimester pregnancy (Table I).

Immunoglobulin levels (IgG, IgM and TgA) in cases of threatened abortion showed no significant change ( $P > 0.05$ ) when compared with first trimester normal pregnancy. Whereas in cases of

spontaneous abortion, there was a significant decrease ( $P < 0.001$ ) in immunoglobulin levels (IgG, IgA and IgM) when compared with normal first trimester normal pregnancy (Table II).

#### Discussion

In cases of threatened abortion no significant difference was found in absolute lymphocyte count ( $P > 0.05$ ) and T

TABLE I  
*T Lymphocyte Studies in Cases of Abortions and of First Trimester Normal Pregnancy*

Particulars	No. of patients	P L C	Total T Cell %	Total T Cell Level/Cu MM
First Trimester Normal Pregnancy	25	R — 2350-2900 AM — 2626.96 SD — 208.70	36-46 39.76 3.65	902.5-1177 1040.88 81.33
Threatened Abortion	10	R — 1850-3080 AM — 2680.04 SD — 492.77 t — 0.24 P > .05	35-39 36.8 1.643 t = 1.75 P > .05	910.08-1087 943.13 1.02 t = 1.82 P > .05
Spontaneous Abortion	10	R — 2792-3582 AM — 3137.8 SD — 352.38 t — 4.34 P < .001	56-64 59.6 2.96 t = 3.77 P < .001	1563.52-2292 1823.8 279.05 t = 12.309 P < .001

TABLE II  
*Immunoglobulins in Cases of Abortions and of First Trimester Normal Pregnancy*

Particulars	IgG mg/ml	IgA mg/ml	IgM mg/ml
First Trimester Normal Pregnancy	R — 1700-1880 AM — 1831.44 SD — 57.53	126 — 178 158.52 18.94	185-294 263.6 36.48
Threatened Abortion	R — 1760-1892 AM — 1823.33 SD — 57.53 t — 1.67 P .05	135 — 152 150.56 10.2 t — 1.62 P .05	200-280 253.16 29.15 t — 1.23 P .05
Spontaneous Abortion	R — 482-989 AM — 895.16 SD — 73.51 t — 31.4 P .001	120 — 160 138.4 15.83 t — 2.95 P .001	134-172 154.2 16.22 t — 6.4 P .001

Cell level. Whereas in spontaneous abortion cases, absolute lymphocyte count and T cell level were significantly higher ( $P < 0.001$ ) when compared with first trimester normal pregnancy. Our findings are similar to Halbrecht and Kalmos (1968) who found an increase in number of transformed leucocytes in the mixed leucocytes culture of wife and husband. Thilkainen *et al*, 1974 and Terasaki *et al*, 1970 found absence of lymphocytotoxic antibodies to paternal antigen in cases of abortion which are usually present in cases of normal pregnancy. The absence of lymphocytotoxic antibodies may be the responsible cause for increased cellular immunity in cases of abortion.

Immunoglobulin studies (IgG, IgA and IgM) in cases of threatened abortion revealed no significant decrease ( $P > 0.05$ ), when compared with first trimester control. Hellstrom (1970) suggested that increased humoral immunity in cases of first trimester of normal pregnancy as compared to non-pregnant, might be a protective phenomenon for acceptance of foetal allograft.

In cases of spontaneous abortion, there was a significant decrease in the mean levels of IgG, IgA, and IgM ( $P < 0.001$ ), when compared with normal first trimester controls. Rocklin *et al* (1976) and Gatti *et al* (1975) demonstrated the absence of blocking factor in cases of abortions which is chemically related to IgG. This highly depressed humoral immunity in our series may be the cause of the absence of this blocking antibody. Similarly, Thang *et al* (1974), also found the presence of macromolecular protein (alpha-2-globulin) in normal pregnant women which was low in cases of abortion.

#### Conclusion

(1) In cases of threatened abortion

there was no significant decrease ( $P > 0.05$ ) in PLC, T Cell, IgA, IgM and IgA level as compared to first trimester normal pregnancy, thus showing no change in cellular as well as humoral immunity which may be responsible for continuation of pregnancy.

(2) In spontaneous abortion there was a significant ( $P < 0.001$ ) rise in PLC, T Cell as compared to first trimester normal pregnancy showing increased cellular immunity. While the humoral immunity showed a significant decrease ( $P < 0.001$ ) in IgG, IgA and IgM level. The increased cell mediated immunity in cases of spontaneous abortion may be responsible for rejection of foetal allograft, thus preventing the pregnancy from continuing.

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