

# QUANTITATION OF IMMUNOGLOBULINS IN MALIGNANCY OF UTERINE CERVIX

by

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## SUMMARY

Quantitative estimation of serum-immunoglobulins (IgG, IgA and IgM) were done by single-radial immunodiffusion technique in 24 patients with cancer cervix along with 10 normal control women.

The mean serum level of IgG and IgA were found to be significantly increased ( $P < 0.003$ ) as compared to the normal control group. This increase in level of IgG and IgA, which may be due to non-specific antigenic stimulus due to tissue destruction by the tumour, indicates that IgG and IgA have a protective effect on female genitalia against the carcinogenic agents. It also indicates the immunological and defence existing in the body of the patient during the onset of early changes which lead to cancer cervix.

This test can act as a diagnostic tool and help in early detection. Its continuing study during treatment and after treatment can enable us to know the response of different modalities of treatment and forecasting the prognosis respectively in these patients.

## Introduction

Since years, scientists are struggling to device a method which can help in establishing the diagnosis of carcinoma of cervix uteri at an early stage when it can not be felt by the examining fingers and has not progressed to an extent to produce symptoms. The critical role of

immunological functions in the etiology and pathogenesis of neoplasm is well established. Production of various antibodies against tumour antigens is reflected as changes in serum immunoglobulins (Barlow and Bhattacharya, 1975; Boronow *et al*, 1974). Increase in some particular fractions of serum immunoglobulins is known to occur in malignancies like GIT, liver and lung and can be detected easily at a very early stage and

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may prove useful in prognosis and treatment.

#### *Material and Methods*

For the purpose of study the blood serum of histologically proved cases of early carcinoma cervix were taken and estimated for quantitative value of immunoglobulins (IgG, IgA and IgM) before treatment. A total of 24 cases have been studied.

The quantitative estimation of serum immunoglobulins in the patient, was done by single radial immunodiffusion method on Tri-Partigen Immunodiffusion Plates to IgG, IgA and IgM manufactured by Behringwerke, A. G., Marburg, West Germany. These are the transparent plastic plates having a layer of semisolid substance (Agar) mixed with respective antisera. It has got 12 wells of 2 mm diameter each, cut on the layer of Agar in which the sample sera is introduced for quantification. This whole plate is covered with a transparent plastic lid.

During estimation the plates were firstly opened and left for approximately 5 minutes at room temperature to evaporate the condensed water if present. After this the filling of wells present in the plate was done. For this the graduated capillary and dispenser was used and each well of each plate i.e. plate for IgG, IgA and IgM was filled by 5  $\mu$ l. of respective patient's serum. For quantitation of IgA and IgM, the serum samples were filled without dilution, whereas for estimation of IgG, the serum samples were diluted with isotonic saline in ratio of 1 and 10 (1:10).

After this the sera, were allowed to disappear into the agar present in the plates. Thus the plates were closed tightly by their lid and incubated at room

temperature, in upside down in position to prevent any possible evaporation. For formation of optimal precipitation rings, the plates containing IgG and IgM antisera were incubated for 80, 50 and 50 hours, respectively. After completion of precipitation rings the diameter of the rings present around each well, appeared as the result of diffusion, were measured by the help of partigen ruler, and the corresponding values were obtained from the reference table for each ring showing concentration of respective immunoglobulins.

In addition, serum immunoglobulins estimation was also done in the same way in 10 normal healthy women and treated as control group. The mean values of their estimate was compared with the standard control sera supplied by the Behring Company to ascertain and fix the standard profile of the normal population of a particular area.

#### *Results*

The mean values for the serum immunoglobulins IgG, IgA and IgM with standard deviation, in healthy control group and in patients with cancer uterine cervix have been calculated and summarized in Table I. In this Table the values in the control group were also compared with the values in the malignant lesion group and 'P' values were calculated and have been given where the comparison has been found to be statistically significant. Although the value of all the immunoglobulin i.e. IgG, IgA and IgM has been found to be quite high in the test group than the values of control, yet the values of IgG has been observed to be remarkably high than the value of IgA and IgM.



TABLE I

Mean Values With Standard Deviation of Serum Immunoglobulins in Control Group and Patients of Cancer UT Cervix

Immunoglobulins No. of Obs.		Control 10	Cancer Patients 24
IgG	MEAN	92.59	217.65***
	S.D. $\pm$	21.53	43.63
IgA	MEAN	124.96	158.37***
	S.D. $\pm$	22.53	31.39
IgM	MEAN	117.10	160.91***
	S.D. $\pm$	39.86	48.72

\* =  $P < 0.01$

\*\* =  $< 0.003$ .

### Discussion

Immunoglobulin disorder have been reported by many authors in diseases like hepatitis (Heremans, 1960), ataxia telangiectasia syndrome (Steihem and Fundenberg, 1966, rheumatoid arthrities (Claman and Merrill, 1966). Besides this as a result of widespread interest in the field of immunology and its applications several workers have also assessed the immune status of the patients with various type of malignancies like leukaemia (Miller, 1962), non-hodgkin lymphomas (Jones *et al*, 1977) and malignancy of G.I.T. (Vaidya *et al*, 1979). But the valuable subject is still seeking better position in the malignancy of various organs like cancer of female ure-genital system. Although Barlow and Bhattacharya (1975) and Disaia (1975) have described the immunological aspects of ovarian cancer yet no data is available regarding the cancer of uterine cervix.

In this study, carried on the patients of early cancer cervix, a marked increase was found in the level of serum immunoglobulin IgG (Mean-217.65) in respect to

normal control (mean-92.59) and this increase in level of IgG was highly significant ( $P < 0.003$ ). The IgA was also increased (mean-124.96) with the significant value ( $P < 0.003$ ) as it was in the case of IgG. But the level of IgM was increased to a lesser extent with the significant  $P < 0.01$  in the patients as compared to normal controls.

Thus the levels of IgG and IgA has been observed to be markedly increased in the patients of cancer cervix. This increase in the level of IgG and IgA, which may be due to non-specific antigenic stimulus due to tissue destruction by the tumour, indicates that IgG and IgA have a protective effect on the female genitalia against the carcinogenic agents. It also indicates that the immunological servellance and defence existing in the body of the patient during the onset of early changes of cancer cervix.

Hence on the whole it can be surmised that there is some increase in serum immunoglobulins level during the onset of aerly changes which lead to cancer uterine cervix and these changes can be

detected early enough by quantitation of different serum immunoglobulins in such patients. Its continuing study i.e. quantitation of different serum immunoglobulins levels at varying intervals during treatment and after treatment can also enable us to know the response of different modalities of treatment and forecasting the prognosis respectively in these patients.

**Conclusion**

In this study, however, any definite conclusion may not be drawn from this preliminary study of a single population. But this is clear that on the whole there is some increase in the serum immunoglobulins during the onset of early changes leading to cancer cervix which can be detected early enough by estimating the serum immunoglobulins. Further studies

in different populations of different areas are called for to substantiate the view.

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See Figs. on Art Paper III

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