

ESTIMATION OF SERUM IMMUNOGLOBIN LEVELS IN PATIENTS USING INTRA-UTERINE CONTRACEPTIVE DEVICE

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SUMMARY

Serum immunological levels was done in 32 cases. There was significant rise in IgG, IgM. There was no significant rise in IgA level.

Introduction

Intra-uterine contraceptive devices (I.U.C.D.) so far seem to play an increasingly important role in modern contraceptive practice. The acceptability of this method of contraception is maximum because after once getting the loop inserted, the women can forget about it.

In spite of being such a popular method of fertility control, its exact mode of action is largely unknown. Numerous hypothesis have been proposed regarding the mode of action of I.U.C.D. However, all evidences point to the interference with implantation as most probable mode of action (Morgestern et al 1966).

Recently much work has been done to show the immunological rejection of pregnancy. The implantation of blastocyst with its genetically foreign cells invading the uterine epithelium represents a sensitive form of immunological tolerance. It is most likely that at this critical

stage I.U.C.D. has its contraceptive effect. It has been shown that I.U.C.D. induces definite alteration in different types of immunoglobulin levels in serum which may be in someway responsible for its antifertility effect. It seems that circulating antibodies Ig^G, Ig^M and Ig^A are formed to the possible challenge which may be I.U.D. itself or chronic inflammation which has been demonstrated to induce the production of auto-antibodies to endogeneous cellular components (Willioughby and Ryam 1970). Mishell and Moyer (1969) suggested that contact of the I.U.C.D. with the endometrium and stroma may produce sufficient tissue injury to release cellular fragment which could act as antigen, thereby increasing immunoglobulin levels.

Holub, et al (1971) were first to present the evidence that I.U.C.D. was capable of inducing alteration in circulating immunoglobulin levels (Ig^G and Ig^M).

Tatra et al (1976) worked on 37 women using copper T. I.U.D. They observed a rising trend in serum concentration of Ig^G, Ig^M and Ig^A following insertion of Copper T. (6.12 months).

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The present work has been undertaken with a view to gain an insight in the immunological changes induced by intra-uterine device which may be possible mechanism of its action.

Material and Methods

Thirty-two cases were included in the present study. The patients coming for contraceptive advice were interviewed, examined and cases suitable for I.U.D.

contrifuged separated and stored at 20°C.

Two more samples were collected in a similar manner at the interval of 4 and 8 weeks following insertion of I.U.D.

Single Radial diffusion method of Mancine et al (1965) was used for quantitative determination of Immunoglobulins G.A. and M.

Result and Observations

TABLE I

Serum Immunoglobulin Levels Before Insertion, 4 and 8 Weeks After Insertion of Copper T. Device

		No. of cases	Mean mg/ 100 c.c.	S.D.
IgG	0 weeks	32	121.78	350.67
	4 weeks	30	1347.33	445.17
	8 weeks	28	1580.86	474.88
IgA	0 weeks	32	219.82	50.64
	4 weeks	30	224.78	60.11
	8 weeks	28	231.42	59.23
IgM	0 weeks	32	140.65	57.71
	4 weeks	30	148.28	66.00
	8 weeks	28	172.98	65.54

insertion were motivated for the use of Copper T.

The ideal time for insertion of loop is on the last day of menstruation or during the following two days when the insertion is easy. It can also be inserted within 2 to 4 weeks following delivery and immediately following M.T.P. by suction.

Collection of Samples

Each patient was convinced for the significance of blood testing.

5 ml of blood was drawn from the anti-cubital vein before the insertion of I.U.D. with a sterilized dry syringe. Serum was separated. The separated serum was transferred in another test tube and was

It is clear that there is a gradual but remarkable rise in Ig^A. At a 0 week the mean Ig^G level is 121.78 ± 350.67. After 4 weeks the level increased and at 8 weeks the level was still higher.

However, there was no appreciable rise in Ig^A level at 4 weeks and even after 8 weeks of insertion. Serum Ig^M level showed a slow rise with increasing duration of I.U.D. use.

The above Table denotes that during the period of 4 weeks following I.U.C.D. insertion there was mean rise in Ig^G, Ig^A and Ig^M levels. Ig^M increased by 128.55 mg% but these result were not found to be statistically significant as indicated by P values.

TABLE II

Comparative Study of Immunoglobulin Levels (IgG, IgA and IgM) From 0-4 Weeks Following I.U.D. Insertion

Duration	Type of Immunoglobulin	Mean rise mg-100 c.c.	P. Value	Remarks
0-4 weeks	IgG	128.55	>0.2	Not significant
	IgA	4.96	>0.6	Not significant
	IgM	7.63	>0.7	Not significant

TABLE III

Comparative Study of Serum Immunoglobulin Levels (IgG, IgA and IgM) From 4 to 8 Weeks Following I.U.D. Insertion

Duration	Type of Immunoglobulin	Mean rise in serum level mg/100 c.c.	P. Value	Remarks
4-8 weeks	IgG	233.53	<0.05	Significant
	IgA	6.64	>0.6	Not significant
	IgM	24.70	>0.4	Not significant

TABLE IV

Comparative Study of Serum Immunoglobulin Levels (IgG, IgT and IgM) From 0-8 Weeks Following I.U.D.

Duration	Type of Immunoglobulin	Mean rise serum level mg/100 c.c.	P. Value	Remarks
0-8 weeks	IgG	362.08	<0.001	Highly significant
	IgA	11.60	>0.4	Not significant
	IgM	32.33	<0.05	Significant

The above Table indicates that there was statistically significant rise in serum Ig^G. The level increased by 233.53 mg% during 4-8 weeks. Mean Ig^A and Ig^M levels also showed serum rise but that was not found to be significant.

During the period of 0-8 weeks following I.U.D. insertion there was mean rise in serum Ig^G by 360.08 mg%. Ig^A level showed no significant alteration, while serum Ig^M was found to be increased by 32.33 mg%.

Discussion

The present work showed a highly significant rise in Ig^G by 8 weeks and Ig^M also showed a significant rise. Rise in Ig^G occurred earlier than Ig^M. There was no significant change in serum Ig^A level which is exactly the same that has claimed by Gump et al (1973) and Chandra et al (1974). However, Mountrose and Co-workers (1975) reported a significant rise in Ig^A, Shulman et al (1974) have also shown a progressive rise in Ig^A level.

From the evidence presented in the present work and from the work in this field it appears that the mechanism of I.U.D. function could be immunologically dependent.

A critical question raised by these studies is what is the cause of the increased immunoglobulin levels observed in women using I.U.C.D. The possible antigenic challenge may be the I.U.D. itself or the chronic inflammation which has been demonstrated to induce the production of auto-antibodies to the endogenous cellular components (Willoghby and Ryam, 1970).

Mishell and Moyer (1969) suggested that contact of the I.U.D. with the endometrium and stroma may produce sufficient tissue injury to release Cellular fragments which could act as antigen thereby increasing, the immunoglobulin levels. A non-specific inflammation is found to be present around the I.U.D. and this may be sufficient to explain immunoglobulin changes observed, whatever may be the cause of the rise in circulating immunoglobulin this is in association with non-specific inflammation in the uterine cavity with the resultant increased vascular permeability, the immunoglobulin pass into the interstitial and intraluminal spaces when the arriving blastocyst with its genetically foreign cells meets such a hostile environment, it may be unable to implant or resist phagocytic attack, will disintegrate or will fail to develop. Most probably this is the critical period when I.U.D. has its

anti-fertility action. Antifertility action of I.U.C.D. starts a few days after its correct insertion and conception is possible after a few days following its removal. It seems possible that it takes time for immunological re-adjustments following insertion or removal of I.U.D.

For further progress of work a thorough study of I.U.D. influenced uterus is required as well as a comprehensive evaluation of the role of immunoglobulin in the inflammation and development of blastocyst is mandatory.

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