

CLINICO-HISTOPATHOLOGICAL EFFECTS OF IUD

by

PRABHAVATHY KUNDERS,* M.R.C.O.G.

and

DOSS SUDARSANAM,** B.Sc., M.D.

Intra-uterine contraceptive devices have been widely accepted as effective methods of birth control. Despite considerable research, the mechanism of action and their effect on the endometrium have still not been elucidated accurately. An IUD is a foreign body in the uterine cavity and is in direct contact with the endometrium.

Opinions differ on the effect of a foreign body on the endometrium. Oppenheimer (1959) considers IUD as harmless. Rozin and Ekerling (1956) have reported cases with endometrial inflammation. Wilson *et al* (1965) found increased superficial vascularity and development of large thin-walled vascular channels, together with the presence of oedema in the superficial layers. The present work was undertaken in order to study the clinical and histological side-effects of IUD.

Material and Method

The device used in this study was Lippes loop, size 30 mm. A

*Prof. of Obst. & Gynec., Christian Medical College & Hospital, Vellore, S. India.

**Present address: Clinical Pathology Unit, Princess Tsahai Hospital, Addis Ababa, Ethiopia.

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careful history was obtained in every case and a thorough pelvic examination was performed. Women with evidence of pelvic inflammation or abnormal uterine bleeding were not considered for the use of IUD. Sixty-one women who had IUD retained for a period ranging from 3 to 48 months are included in this communication. A single biopsy specimen of 3 surface strips of adequate endometrium was obtained in each of these 61 women; in 7 women a repeat biopsy was taken after an interval of 12 months or more. Thus, a total of 68 biopsy specimens was considered. At the time of taking the biopsy, symptoms presented by the women were recorded. Fifty-four cases had strip biopsy and 10 had complete uterine curettings obtained at the time of removal of IUD under anaesthesia.

In another 4 cases hysterectomy specimens were examined with IUD retention for 3-5 months. The indication for hysterectomy in each case was uterine prolapse. The IUD was introduced in these cases for no other purpose than to study the changes in the endometrium. Endometrial biopsies from a sample of 100 non-looped women of the same age group who attended the gynaecological out patient department were studied for the purpose of comparison.

Histological dating was based on the criteria suggested by Noyes, *et al* (1950) for gland and stromal cell changes during the normal menstrual cycle. Dating was not considered abnormal unless there was a discrepancy of at least 4 days between the calculated cycle day and the endometrial pattern.

Inflammation was considered to be present only when there was presence of lymphocytes with plasma cell infiltration. The presence of plasma cells is an important criterion for endometrial inflammation.

Vascularity was diagnosed when numerous thin-walled vessels were identified in the superficial layer of the endometrium directly beneath the surface epithelium.

Phase correlation between the histological appearance and that anticipated for the stated day of the menstrual cycle was studied in 22 cases. Slight to moderate histological lag was seen in 9 cases, histological appearance was mildly ahead of the

stated day of cycle in 3 cases and coincided in 10 cases.

Results

The 68 cases were classified under 3 groups according to the period of retention of IUD.

White discharge was not a significant symptom.

Pain: There was a gradual increase in the incidence of pain with prolonged period of retention.

Menorrhagia: Between 32-36% of cases complained of menorrhagia irrespective of the period of retention (Table I).

Inflammation: 18 biopsies showed microscopic evidence of moderate to severe inflammation (Fig. 1). Two biopsies showed definite lymphoid follicles. In one of them the follicles were scattered all over the endometrium and in the other which was a hysterectomy specimen, the follicles were found in the trough underlying the loop (Figs. 2 and 3, and Table II).

TABLE I
Clinical symptoms in relation to period of retention

Months of retention	Total No. of cases	Symptoms							
		Menorrhagia†		Pain.		White discharge		Nil	
		No.	%	No.	%	No.	%	No.	%
3-12	25	8	32	1	4.0	—	—	17	68
13-24	25	9	36	4	16.0	3	12.0	16	64
25-48	18	6	33.3	5	27.8	—	—	8	45.44

TABLE II
Pathological findings in relation to period of retention

Months of retention	Total No. of cases	Histological findings											
		Inflammation		Oedema		Spindling		Hyperplasia		Vascularity		Nil	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
3-12	25	8	32	12	48	12	48	6	24	8	32	2	8
13-24	25	6	24	10	40	13	52	8	32	4	16	6	24
25-48	18	4	22.2	10	55.5	7	38.7	6	33.3	9	50	1	5.5
Total	68	18	27%	32	47%	32	47%	20	30%	21	31%	9	13%

Oedema: Of the 32 biopsies which showed microscopic oedema, 5 had severe oedema and the rest showed mild to moderate oedema. The maximum number of biopsies showing oedema was in the third group.

Spindle cells in the stroma: Spindle cells were present in the stroma of the endometrium in 32 biopsies. A greater number of spindling was seen in the first two groups.

Hyperplasia: Twenty biopsies showed minimal to marked focal

creased vascularity, subsurface haemorrhage, inflammation and mild glandular hyperplasia.

Correlation of histopathological findings with clinical symptoms reveals that of those with no histopathological abnormal findings, 44.4% of cases had menorrhagia and 22% had pain. In general, there does not seem to be any appreciable correlation between the histopathological findings and clinical symptoms (Table III).

TABLE III
Correlation of clinical symptoms with endometrial histology

Pathology	No.	No symptoms		Menorrhagia		Pain		White discharge	
		No.	%	No.	%	No.	%	No.	%
Nil	9	4	44.44	4	44.44	2	22.22	—	—
Oedema	32	22	60.75	7	21.87	3	9.37	1	3.12
Vascularity	21	16	76.18	5	23.81	3	14.28	1	4.76
Spindling	32	17	53.12	13	40.62	4	12.5	3	9.37
Inflammation	18	13	72.22	4	22.22	3	16.66	2	11.11
Hyperplasia	20	12	60.00	7	35.00	3	15.00	3	15.00

glandular hyperplasia, 3 of these showing marked cysto-glandular hyperplasia. In one case the endometrial glands revealed a tendency to appear more like the endocervical type of glands. The significance of this is not clear. With increased period of retention the number of biopsies with glandular hyperplasia showed a slight increase (Fig. 4).

Vascularity was seen in 21 cases. With the increased months of retention there is a definite increase in the vascularity of the endometrium (Fig. 5).

Hysterectomy specimen: There was evidence of compression of the endometrium by the loop. All the four specimens showed increased congestion, both on the trough and on the ridge, with focal oedema, in-

Comments

In our study of the 50 women who had IUD retained for a period ranging from 3-24 months, 64-68% did not present any symptoms. With the increased period of retention from 24-48 months, women without any symptoms decreased to 45%.

Irrespective of the period of retention, about one third of the women complained of menorrhagia the cause of which is difficult to postulate. It could be an incidental finding or it may be due to inflammation, oedema, increased vascularity or hyperplastic endometrium. Nor could one rule out the possibility of a state of anxiety in women produced by the constant awareness of the presence of a foreign body in the uterus. According to Jeffcoate, (1962), this psychic factor

operates possibly through the endocrine system which is influenced by the hypothalamus, but more probably through the autonomic nervous system which controls the blood vessels supplying the pelvic organs.

Glandular hyperplasia was observed in 24-33% of the biopsies, the incidence gradually increasing with longer periods of retention. Only 7 of these patients had menorrhagia associated with hyperplasia. In comparison, among the non-looped women the incidence of hyperplastic endometrium was only 10%. Normally, hyperplastic endometrium is caused by faulty ovarian function. But, in the case of IUD retention this could also be traced to the psychic factor causing vascular disturbances which involve the ovaries. The faulty ovarian function may partially explain the contraceptive effects of IUD.

Among the women who retained IUD for 3-12 months, 32% showed inflammation, whereas among those who retained it for 25-48 months only 22% showed such changes. A similar observation has been reported by Rozin *et al* (1967). This suggests that endometritis does not increase with longer periods of retention. It was further observed that 72% of those who showed microscopic inflammation did not present any clinical symptoms. This suggests that the inflammation is rather minimal.

In two of the biopsies lymphoid follicles were present. In one, the follicles were seen scattered all over the endometrium and in the other, which was a hysterectomy specimen, the follicles were found in the trough underlying the loop. This could be

due to a long standing chronic inflammation.

Spindle cells were seen scattered all over the stroma of the endometrium in 32 biopsies. A greater number of spindling was seen in the first 2 groups. The presence of these spindle cells and their significance are not fully known. It is, however, reported by Wilson and Ledger (1965) that the spindle cells in the endometrium could be due to increased proliferation of blood vessels. It is also possible that the origin of these spindle cells could be from the immature fibroblasts which are produced as a result of reaction to IUD. This, however, needs further illumination by special stains, electromicroscopic and enzyme studies.

Summary

A study was made of clinical and histological effects of IUD on 61 women in whom Lippes loop was retained for 3-48 months. A total of 68 biopsy specimens was studied.

A significant presenting symptom was menorrhagia in 33% of cases. The histology of the endometrium from women who had Lippes loop retained in the uterus differs from that of the normal.

Glandular hyperplasia was observed in 24-33% of the biopsies, the incidence gradually increasing with longer periods of retention. It has been postulated that faulty ovarian function could be responsible for the menorrhagia and for the hyperplastic endometrium. The faulty ovarian function may partially explain the contraceptive effect of IUD.

The incidence of microscopic inflammation was higher in the initial

period of retention, the inflammation gradually decreasing from 32% in the first group (3-12 months) to 22% in the third (25-48 months). However, this inflammation is to be considered rather minimal as 72% of those who showed microscopic inflammation did not present any clinical symptom.

In general there does not seem to be any appreciable correlation between the histological findings and clinical symptoms.

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See Figs. on Art Paper IV & V