

ENDOMETRIAL MAST CELLS IN LOOP MENORRHAGIA

by

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and

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In spite of extensive work on the correlative study on the structure and function of mast cells, and the menographs emerged therefrom, it continues to remain a biological curiosity; Workers in this field have contended that it is an essential cell in mucopolysaccharide metabolism, that it acts as a source of nutrition for the connective tissue (Riley, 1963) that it reflects the carcinogenic alteration of skin by chemicals in animals (Simpson, 1963), that it is very similar to chromaffin system in their secretions, (Goupland, 1963) and that it mediates hypersensitivity reaction to a great extent (Mota, 1963). Observation and comparison of these cells are further complicated by the varying number and staining reactions they yield in different organs of the same animal, and in different specials. This makes interpretation of findings in experimental animals not totally acceptable in man.

Effect of hormones, especially sex hormones is noted on blood basophils. Boseila (1963) has done extensive studies showing that blood basophils are higher in females than in males. He found decreases of these cells in pregnancy and postmenopausal period, and in-

crease in functional menstrual disorders with menorrhagia. We have, in the present work, restricted our attention to a study of endometrial mast cells in cases of loop menorrhagia, and will limit our discussion to this aspect alone.

Material and Methods

Forty-five cases of loop menorrhagia were analysed, but the material subjected for detailed histology were only from thirty cases. Two groups served as control, viz endometrium from non-bleeding cases and from dysfunctional uterine bleeding. An equal number of cases who were clinically diagnosed as dysfunctional uterine bleeding, and who had endometrial hyperplasia in the histology was one group, and patients who had no bleeding but had undergone curettage for sterility, or as a preoperative step in hysterectomy in prolapse uterus were the second group. 1% toluidine blue, modified toluidine blue (where the exposure to toluidine blue is longer with better differentiation. New methylene blue, nuclear fast red aluminium sulphate, periodic acid schiff stain, dominici's stain, McManus and Mowry's modification of colloidal iron stain, and Giemsa's stain were done in the first few samples (Coupland and Heath, 1961) and the first two stains were chosen as the most satisfactory. In every sample, 10X eye piece was used and oil immersion fields were scanned and the mast cells were grouped

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Fig. 1
Shows "Peau-De-Orange" appearance with retracted nipple.



Fig. 2
Fungating growth on chest wall.

Internal Iliac Artery for Uncontrollable Haemorrhage—Das pp. 413-416



Fig. 1
Shows Communitated fracture of left pubic, dislocation of symphysis. Fracture of right ala of sacrum.

Mixed Mesodermal Tumour of the Cervix and Uterus—Madhavan et al. pp. 423-425



Fig. 1
Photograph showing the huge fungating growth arising from the posterior and left lateral lips of the cervix.



Fig. 1
Shows a soft polypoidal tumour arising from cervical canal.

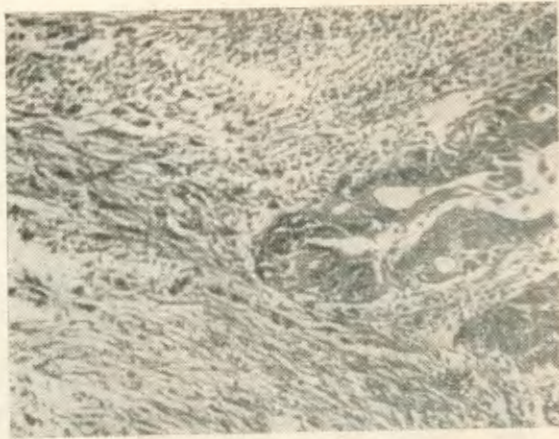


Fig. 2
Microphotograph showing adenocarcinoma with stroma showing malignant changes.

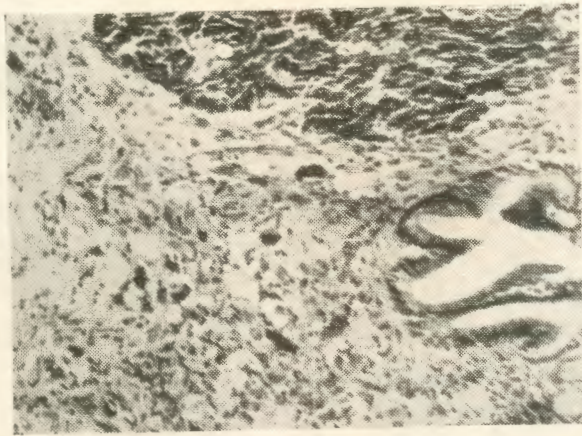


Fig. 3
Microphotograph showing stromal (endometrial) sarcoma (upper portion), gland showing sarcomatous changes.



Fig. 1

Case No. 1 showing terminal thick hair on the face.



Fig. 2

Same case showing enlargement of clitoris..

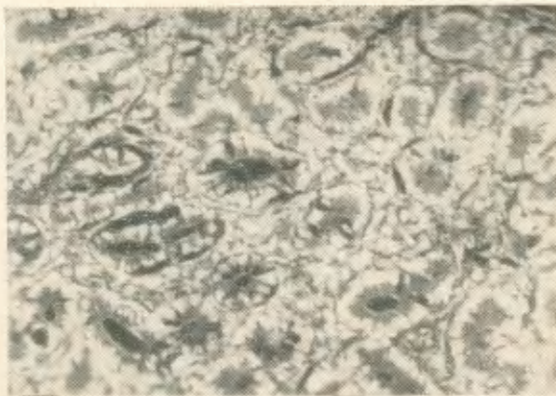


Fig. 3

Micrograph shows a typical well differentiated arrhenoblastoma.

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under intact and degranulating ones. The results are compared and discussed.

Observations

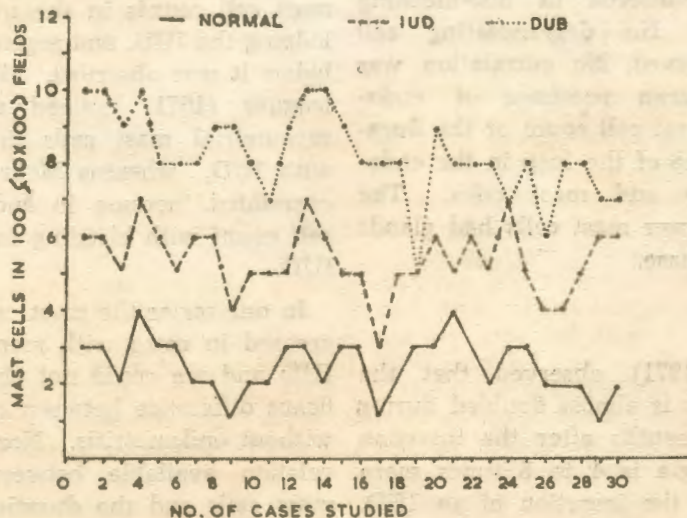
The cases of menorrhagia after loop insertion were in the age group of 20 to 40 years, 67% belonging to 3rd decade and 24% to 4th decade. Irregular bleeding was the complaint in 52% and profuse and often painful periods in another 38%. The duration of continuous presence of loop in the uterus was given in 71% of cases, as varying from 6 months to 4 years. In 84% the curettage was done immediately after the removal of the loop.

The endometrial glands were in proliferative phase in 56%, associated infection was present in 16% and hyperplasia in another 16% out of these. The remaining 44% were in secretory phase, 6% of them showing endometritis. Thus, evidence of endometritis was present in only 11% of our cases. The scanning was strictly limited to endometrial

stroma between the glands and did not include fibrosed endometrium or myometrium.

The mast cells of endometrial stroma, in general, showed a poorer staining quality than those seen in nasal polypi or mastoid granulation tissue, where they take a brilliant metachromatic stain. Moreover, the endometrial mast cells contained fewer granules, thus making identification difficult, especially amidst the stromal cells of a proliferative endometrium. The non granular pre-mast cells could certainly not be identified from the stromal cells and lymphocytes because the latter cells exhibited a non-specific metachromatic peripheral aura, which made us rely on the size of cells, presence of granules, and metachromatic staining property of these granules.

In non-bleeding endometrium which were taken as normal in this series, the mast cells count varied from 1 to 4, and out of 30 showed degranulating mast cells varying in number from 1 to 2.



(THE NO. OF CELLS FOR EACH CASE IS INDICATED)
 FIG. 1. TO SHOW THE MAST CELL COUNT IN LOOP MENORRHAGIA

Less number of cells were encountered in endometrium in the secretory phase, probably due to the reduced endometrial stroma. In the other control group which showed endometrial glandular hyperplasia with a clinical diagnosis of dysfunctional uterine bleeding, the mast cells count varied from 5 to 10, the mean average falling between 8 and 9 cells. In no slide did we see any degranulating cell despite the increase in cell number. The mast cells were bigger in size with more number of granules than in non-bleeding endometrium, and could be identified with much more ease.

The cells were scattered in the endometrial stroma and did not show any specific locational relationship in connection with dilated or normal sized endometrial glands.

In tissue of loop menorrhagia, the mast cell count varied from 2 to 7, the mean average falling between 5 and 6 cells (Fig. 1). Here again the cells were bigger and had more granules than in those encountered in non-bleeding endometrium. No degranulating cell could be observed. No correlation was obtained between presence of endometritis and mast cell count or the duration of presence of the loop in the endometrial cavity and mast cells. The tissues with fewer mast cells had glands in secretory phase.

Discussion

Guttorm, (1971) observed that the menstrual flow is almost doubled during the first six months after the insertion and menorrhagia is 4 to 5 times more common after the insertion of an IUD. In a study on histological changes in the endometrium as a reaction to IUD, Moyer and Mishell (1971) failed to

observe any correlation between bleeding and histological changes. Biochemical studies on uterine horns in rats by Wrenn and colleagues (1969) showed significant decrease of histamine content in the IUD horn when compared to the contralateral control horn. This however is contrasting with the finding of Parr (1967) who observed a double concentration of histamine on a wet weight basis in the IUD horn. The situation is not clarified by the finding of Kar and Chandra (1969) that antihistaminic drugs prevent bleeding caused by IUD in Rhesus monkeys.

The same lack of consistency is seen in studies on endometrial mast cells. Mathur and Chaudhry (1969) in a study of mast cell count in the rat uterus with IUD found increase in mast cells in the IUD horn if the animals were sacrificed in the oestrous phase, but not when they were sacrificed in di-oestrous phase. This is intriguing because, in normal rats, there is no significant difference in mast cell counts in oestrous and di-oestrous stages. Also, no significant difference between mast cell counts in the uterine segment lodging the IUD, and segments above and below it was observed. Bhagat and colleagues (1971) noticed a decrease of myometrial mast cells in human uteri with IUD, whereas Mehra *et al* (1970) correlated increase in endometrial mast cell count with bleeding in patients with IUD.

In our series the mast cell count is increased in cases with menorrhagia after IUD and we could not show any significant difference between cases with and without endometritis. Nor was any correlation available between number of mast cells and the duration of presence of the loop in the endometrial cavity. Those with dysfunctional uterine bleeding had the highest number of mast cells

in our series and this is fitting with the published literature. The fewer number of mast cells in non-bleeding endometrium in the secretory phase is a previously reported finding, and this was seen by us in non-bleeding cases and cases of menorrhagia with IUD, one wonders whether to attribute this to the less amount of endometrial stroma scanned in the secretory phase or to hormonal effects.

It is known that the mast cell count is directly related to histamine content of the tissue and Schiff and Burn (1961) have shown that oestrogens will increase the number of mast cells in a tissue and this is due to absence of degranulation. This again indicates reduction in the release of histamine outside the mast cells. As presence of histamine is necessary for normal implantation of ovum, Mathur and Chaudhry (loc cit, 1968) suggest that decrease in diffusible histamine may very well act as the antifertility factor and the more intact mast cells are seen, the more will be this effect. The subject needs detailed attention and further studies to correlate the mast cell count, the histamine content of the uterus and oestrogenic secretion of the ovary will certainly throw more light on this important aspect.

Summary

Endometrial mast cell count in 30 cases of loop menorrhagia showed increase in mast cells when compared to non-bleeding endometrium. The number of mast

cells however were fewer than in dysfunctional uterine bleeding.

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