MAST. CELLS IN HISTOID LEPROMATOUS LESIONS

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ABSTRACT — Ten patients with histoid lesions among the lepromatous leprosy cases, of both sexes in the age group of 35-65 years, were included in this study. Skin biopsy from the nodule with surrounding healthy skin of histoid lesion was taken. The biopsies were fixed in Susa solution and processed for light microscopy. *5-7μ* thick sections were cut and stained with haematoxylin and eosin,Toluidlne blue and Fite Faraco. Observations were made on the dermis to locate the mast cells and bacili. Proliferation of mast cells and their degranulation were seen in the histoid nodule as compared to surrounding normal healthy skin where the cells were mainly intact. The study further investigates the role of mast cells in the histopathogenesis of the disease.

Key words: Histoid leprosy. Histoid hanseniasis. Mast cells.

1 INTRODUCTION

The attention has been drawn to a form of lepromatous leprosy designated "histoid" or resembling nodular subepidemial fibrosis. This type is very common in Ethiopia. The interest in these cases was aroused by the appearance of gross nodulation and by the resistance to sulphone therapy. The mast cells have been studied in murine and human leprosy[3,4,5]. The present study proposes to study the morphological changes of mast cells and their functional role in histoid lesions.

2 MATERIALS AND METHODS

Ten subjects of histoid lesions among the lepromatous leprosy patients of both sexes in the age group of 35-65 years were chosen for the present study. These patients were hospitalized in Shandara Leprosy Home, Delhi. The duration of the illness varied from 15-20 years. Most of the patients showed the slow onset of the disease, starting with tingling and numbness in the hands and feet followed by development of anaesthetic patches on limbs. These patients were on intermlitent dapsone therapy initially and later, on hospitalization, they were on regular treatment. During hospitalization, they developed nodules on the trunk and limbs.

The skin biopsy of nodule along with surrounding healthy skin was taken from all patients. Biopsy was fixed in Susa solution and processed for paraffin embedding. 5-7μ thick sections were cut and stained with a) Haema-

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toxylin and eosin b) Toluidine blue c) Fite Faraco.

3 RESULTS

The normal healthy skin around the nodule showed the occasional presence of intact mast cells (Figure 1). The histological examination of histoid lesions was characterized by the increased cellular activity. Amongst the fibroblasts, macrophages and epitheliod cells, the mast cells formed the dominant component. These mast cells had altered morphology. The normal mast cells had round or oval shape while those of the histoid lesions were thin, elongated and some showed pseudopodia (Figure 2). From the centre of the lesion to its periphery, gradually the mast cells acquired normal shape: The cells were also seen in different stages of degranulations and some had fully degranuled. The shed granules were engulfed by the fibroblasts. Mastocytosis and excessive degranulation was a constant feature seen in all histoid lesions when compared with controls.

4 DISCUSSION

The mast cells are known toundergo morphological changes in various pathological conditions including mycobacterial diseases[1] . *The* histoid lesion is considered to be a type of reaction in which the granulomatous masses are dense and dee p. High mast cell count was observed in such lesions which was attributed to high cellular activity in the lesions. Also, the alteration in the shape of the mast cells was more pronounced in these lesions. From round to mostly oval cells, they changed to thin, elongated, irregular and some with pseudopodia. These changes were in concordance with those observed in human and experimental leprosy [3,4,7] Extensive degranulation, as observed in our study, indicated the functional activity of mast cells. The cells respond to mechanical, chemical and antigenic stimuli and the abundant mast cell count is found in some connective tissue reactions of nude mice[6,7].

Histoid lesion is considered to be a lepromatous reaction where excessive cellular infiltration is seen. The peak proliferation of mast cells was found together with the proliferation of other connective tissue cells. These basic changes in mast cells thus appeared to be a sign of stimulated cell proliferation in these lesions and these changes can be correlated with the severity and course of the lesion. The changes in mast cell morphology may be of some significance. Since we do not know the actual function of the mast cells, it is difficult to evaluate the significance of this proliferation, increased population and degranulation of mast cells. It may be a secondary reaction as mast cells contain a large number of biologically active substances which may be required by proliferating tissues. Another plausible interpretation, assuming that most of the connective tissue cells have a common stem cell, is that induction of proliferation (as a result of disease process) in any one cell series is simultaneously accompanied by proliferation in other cell system. Since leprosy is caused by the *Mycobacterium leprae,* the changes in the mast cells may be either due to disease process or as an outcome of the immune response of the host. This needs to be evaluated further.

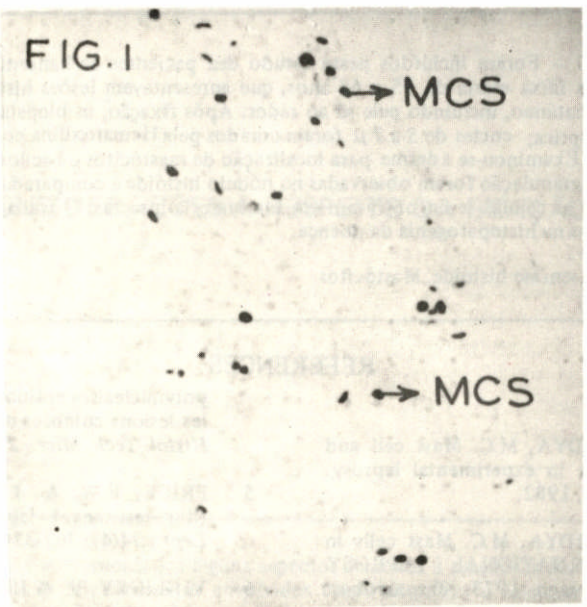

FIGURE 1 – Photomicrograph of the normal human skin showing intact mast cells. Stain toluidine blue x 200.
MCS = Mast cells.

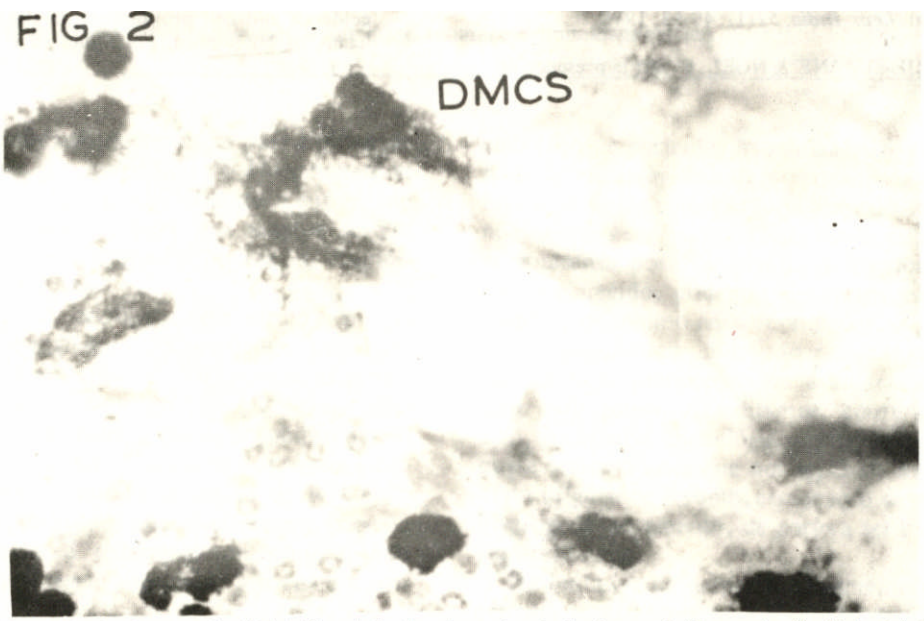

FIGURE 2 – Photomicrograph of histoid nodule showing extensively degranulating mast cells. Stain toluidine blue x 400.
DMCS = Degranulating mast cells.

RESUMO — Foram incluídos neste estudo dez pacientes de hanseníase virchowiana, de ambos os sexos, na faixa etária de 35 a 65 anos, que apresentavam lesões históides. Foi realizada biopsia do nódulo cutâneo, incluindo pele sã ao redor. Após fixação, as biopsias foram processadas para microscopia óptica; cortes de 5 a 7 µ foram corados pela Hematoxilina eosina,. Azul de Tolui-dina e Fite Faraco. Examinou-se a derma para localização de mastócitos e bacilos. A proliferação dos mastócitos e sua degranulação foram observadas no nódulo históide e comparadas com a pele normal circunjacente, onde as células se encontravam em sua maioria intactas. O trabalho investiga ainda o papel dos mastócitos na histopatogenia da doença.

Palavras chave: Hanseníase históide. Mastócitos.

REFERENCES

1 KUMAR, R. & VAIDYA, M.C. Mast cell and ***Mycobacterium leprae*** In experimental leprosy. ***Hansen.Int., 7(1):***1-7,1982.

2 KUMAR, R. & VAIDYA, M.C. Mast cells in leprosy. In: INTERNATIONAL LEPROSY CONGRESS, 10., Bergen 1973: ***Transactions.*** apud ***lnt..L Lepr., 41(4):*** 573, 1973.

3 KUMAR, R.; VAIDYA, M.C.; KESHWANI, N.H. ***In vivo*** response of mast cells to lepromatous ***Lepr. India, 51(1):***49-53, 1979.

4 MARIE-SUZANE & NOEL, R. Sur la presence de polynucleaires eosinophiles et de mastocytes dans les lesions cutanées de la lépre tuberculoide. ***Bull. Hirtol. Tech. Micr., 25(1):*** 5-7,1948-

5 PRICE, E.W. & FITZHERBERT, M. Histoid (high-resistance) lepromatous leprosy. ***Int. J. Lepr., 34(4):*** 367-374, 1966.

6 VIKLICKY, V. & HOLUB, M. Mast cells in skin grafts and omenta of nude mice. ***Folia Idol., 24(6):***434-435,1978.

7 VIKLICKY, V. & POLACKOVA, M. Mast cell incidence and cell proliferation in the lymphoid organs of NZB mice. ***Folia Biol, 15:*** 432-438, 1969.

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