Characterization of Mast Cells Residing in Cutaneous Neurofibromas

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Key Words

Mast cell
Neurofibroma
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showed a comparable histamine release to those from normal skin in response to nonimmunologic stimuli. The maximum net histamine release from neurofibroma-derived mast cells stimulated by A23187 and compound 48/80 was 23.4 ± 11.0 and $12.0 \pm 1.8\%$, respectively, while that of normal skin was 38.5 and $11.5 \pm 3.0\%$, respectively.

Comments

This study confirms that cutaneous neurofibromas in patients with neurofibromatosis contain a large number of mast cells. Cutaneous mast cell suspension, which efficiently responds to nonimmunologic secretory stimuli, was obtained by enzymatic dispersion of neurofibromas. These mast cells may provide a new approach to the elucidation of the etiological roles of mast cells in the development of neurofibromas in neurofibromatosis [4] and an experimental source of human connective tissue mast cells for the investigation of mast cell-mediated cutaneous inflammation.

References

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Introduction

Heterogeneity of mast cells derived from different species and anatomic sites has been demonstrated in recent years [1–3]. Increased numbers of cutaneous mast cells have been observed not only in mastocytosis but also in several cutaneous neoplasms, including neurofibromas, and in various inflammatory conditions. In this study, we examined the mast cell population density and histamine content in cutaneous neurofibromas. In addition, the invitro

responsiveness of enzymatically dispersed mast cells obtained from neurofibromas was assessed.

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Neurofibromas and normal skin were obtained following surgical excision. The population density of mast cells in the cutaneous tissue was counted in paraffin-embedded sections stained with Giemsa's reagent. The histamine content in the extracts from dispersed and boiled cutaneous tissue was measured by HPLC. Mast cell suspension was prepared from freshly excised tissue by enzymatic dispersion using collagenase (200 U/ml), hyaluronidase (200 U/ml), dispase (1.000 U/ml), and DNase (0.5 mg/ml). The histamine release from these mast cells was assessed by stimulation with calcium ionophore A23187 and compound 48/80.

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Results

The population density of mast cells in cutaneous neurofibromas (89.4 ± 5.8 cells/mm²) was approximately three times higher than in normal skin (31.9 ± 2.4 cells/mm²). Tissue histamine content was also found approximately four times higher in cutaneous neurofibromas (30.57 ± 2.47 ng/mg wet weight) than in normal skin (7.31 ± 0.91 ng/mg). Mast cells enzymatically dispersed from cutaneous neurofibromas and normal skin contained 8.7 ± 1.0 and 5.8 ± 0.6 pg/cell of histamine respectively. Dispersed mast cells obtained from neurofibromas