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Case Report

Cytochemical Profile of Mast Cell Leukemia

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AIM

The aim of this work was to show that with the help of cytochemical reactions, like toluidine, chloracetate, alcian blue, acid phosphatase, Sudan Black, PAS and POX the diagnosis of mast cell leukemia is possible.

INTRODUCION

Mast cells are typically 10 to 15 μm in diameter, have a round or oval nucleus, and contain distinctive cytoplasmic granules that are particularly avid for metachromatic dyes, such as toluidine blue, Giemsa, and methylene blue [1].

Although mature mast cells are typically located in tissues having primary contact with foreign antigens, such as the skin and gastrointestinal and respiratory tracts, they originate in the bone marrow [2]. Mastocytosis may be reactive or neoplastic and range from benign syndromes with cutaneous involvement to malignant variants with mast cell infiltration of multiple organs, including the bone marrow. Approximately 15% of patients with malignant mastocytosis develop mast cell leukemia, a very rare variant of acute myeloid leukemia [3].

Mast cell leukemia represents a rare and aggressive subtype of malignant mastocytosis characterized by the presence of large numbers of atypical mast cells in the peripheral blood [4].

CASE REPORT

A 72-year old female was admitted to hospital because of anemia, thrombocytopenia, lost weight and skin lesions of the trunk and underarm. Rtg showed osteolytic lesions of the right thigks and pelvis. FNA of the bone marrow revealed hypercellular smear with 80% of mast cells and immature mast cells which were cytochemically positive to toluidin (Figure 1,2) chloracetate, alcian blue, acid fosphatase and Sudan black and negative to PAS (periodic acid Schiff) and POX (peroxidase). The peripheral blood smear showed single mast cells which were positive to toluidin. The bone marrow biopsy cofirmed mast cell leukemia. The chariogram of the bone marrow showed numerical and structural chromosomal changes. Two month after the diagnosis the patient suffered from right thigks fracture and was treated with local radiotherapy, antihistaminic and analgetic therapy. The patient died within 6 month after the diagnosis.

DISCUSION

Cytochemistry is the study of the chemical constituents associated with cells and their specificity to certain cell types. Used as a follow-up to basic hematology stains (e.g., Wright, Giemsa, Wright-Giemsa stains), which only gives a morphological

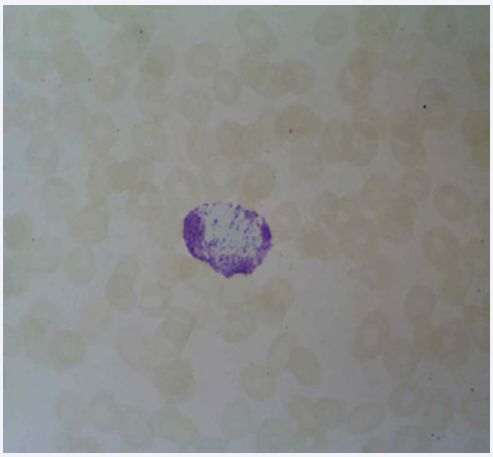

Figure 1 Peripheral blood, Toluidinx1000.

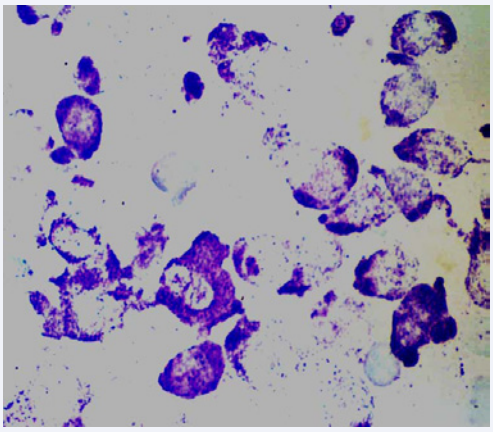

Figure 2 Bone marrow, Toluidinx1000.

representation of the cell, cytochemistry stains are much more specific and react with the chemical constituents of respective white blood cell types. Enzyme cytochemistry reveals not only the location of enzyme but also the intensity of its catalytic activity. The data obtained by enzyme cytochemistry can be easily compared to biochemical enzyme assay in test tubes. Immunocytochemistry detects the enzyme molecule itself, but gives no information about enzyme activity. Thus, enzyme cytochemistry shows distinct biological significance from immunocytochemistry and may form a disciplinary bridge between morphology, biochemistry and molecular biology [5,6].

CONCLUSION

Mast cell leukemia is very rare and high grade leukemia with short survival time. Cytological diagnosis is possible, when there is more then 20% of atypical mast cells in the bone marrow aspirate. The diagnosis of aleukemic variant of mast cell leukemia could be stated if there is less then 10% of mast cells in the peripheral blood.

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