Pseudo Chediak Higashi-like inclusions in myeloblasts in AML-M2

Dear Editor,

Giant purplish cytoplasmic inclusions in myeloblasts/myeloid precursors resembling those present in Chediak Higashi Syndrome (CHS) are described in various subtypes of acute myeloid leukemia (AML).[1] The clinical and prognostic significance of this pseudo Chediak Higashi (PCH) anomaly is largely unclear. Here, we report a case of AML M2 with such inclusions.

A 16-year-old female presented with complaints of fever for 2 months, cough for 15 days, bone pain and bleeding from gums for 7 days. On examination, she had pallor, left axillary lymphadenopathy, sternal tenderness, pedal edema, and mild hepatosplenomegaly.

Hematological investigations revealed hemoglobin of 5.2 gm/dl, total leukocyte count of 71.86 × 10^3/µl, and platelet count of 51 × 10^3/µl. Peripheral smear (PS) showed 48% myeloblasts. Some blasts showed purplish large granules with occasional myeloblasts showing central clearing/vacuole [Figure 1] and a few with Auer rods. The bone marrow (BM) aspirate smears showed 68% blasts of similar morphology as seen in PS. The maturing myeloid component was 20% of all nucleated cells. These inclusions were strongly positive for myeloperoxidase stain but negative for Periodic Acid Schiff. Immunophenotyping revealed positivity for CD33, CD13, CD117, CD34, and HLA-DR and negativity for CD10, CD19, CD7, CD5, and CD14. Thus, a diagnosis of acute myeloid leukemia (AML-M2) with PCH anomaly was made.

Extensive literature search reveals only isolated case reports of PCH anomaly in AML blast cells with the majority of them reported in acute promyelocytic leukemia (APML). By electron microscopy, these giant granules were seen to be formed by the fusion of azurophilic granules, as in CHS. However, unlike the giant lysosomal granules of CHS, these contain numerous very thin microcrystalline structures resembling Auer bodies.[2] Aonuma *et al.* observed PCH anomaly in 5 out of 20 cases of AML M2 and found no differences in clinical, hematological, and chromosomal anomaly in PCH-positive versus PCH-negative subgroups.[3] They observed this PCH anomaly more commonly in BM as compared to PS and hypothesized that the existence of PCH granules and/or a defect of the cytoskeleton impedes their movement from the bone marrow to peripheral smear. Similarly, Powari *et al.* also reported this phenomenon in their case report of AML M2 with this anomaly.[4] However, contrary to this, in our case, PCH anomaly was seen equally well in both PS and BM. Chang *et al.* found consistent aberrant expression of CD2, a pan T cell marker in such cases. They postulated that this phenomenon might stimulate abnormal granule formation and CD2 could be used as an immunophenotypic marker for PCH anomaly in AML.[5] Ahluwalia *et al.* described a case of AML M2 in a child with such inclusions with central vacuoles, as was also observed in the present case.[6]

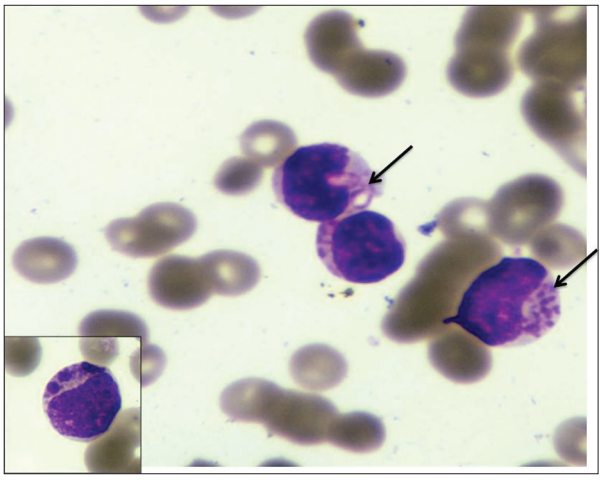

Figure 1: Myeloblasts showing giant granules with central vacuolisation. Inset shows giant granules in myeloblast. (Wright stain ×1000)

The clinical significance of these inclusions is unclear. However, few authors have reported a poor outcome because of fulminant infection[1] or refractory DIC.[2] The clinical and prognostic significance of patients with AML with the PCH anomaly requires the study of large series with long-term follow up.

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