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CASE REPORT

Simultaneous occurrence of multiple myeloma and acute myeloid leukemia

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ABSTRACT

Multiple myeloma and acute leukemia may sometimes occur in the same patient, usually in patients with myeloma who receive chemotherapy and subsequently develop acute leukemia. However, simultaneous occurrence of myeloma and acute leukemia on presentation is rare, with only a handful of such cases reported in the literature.

Key Words: Acute myeloid leukemia, multiple myeloma, simultaneous

INTRODUCTION

The co- occurrence of the myeloma with acute myeloid leukemia is extremely rare. Whenever such entity exists, we have to make sure that either of them is not therapy related. Clinicians should be aware that presence of plasma cells in a case of myeloid leukemia does not satisfy the criteria of myeloma unless other factors also exist. Treatment is not well defined however keeping in view of aggressive nature of the myeloid leukemia it can be treated in the lines of myeloid leukemia wherever transplantation is not an option.

CASE REPORT

A 57-year-old man presented with a four-month history of fatigue, shortness of breath, diaphoresis, weight loss of 3 kg, and generalized body pain. Clinical examination revealed pallor and hepato-splenomegaly. Investigations showed that the patient had a hemoglobin level of 6.0 g/dl, white blood cell count of 39.000/µL, absolute blast count of 11.700/µL (30%), and total protein level of 10.5 g/dl with 3.0 g/dl albumin. The serum immunoglobulin (Ig) assay showed an IgG level of 6.3 g/dl. A bone survey demonstrated lytic lesions in the pelvic bones and skull.

Bone marrow examination demonstrated normal cellularity with myeloid maturation arrest and normal megakaryopoiesis. A double neoplastic cell population was evident (Figure 1). The first component of this population was represented by numerous plasma cells comprising 25% of the neoplastic cells and the second component by a population of myeloblasts - 40%.

Cytoplasmic myeloperoxidase was positive, and flow cytometry demonstrated blastic cells expressing CD13 and CD33. These findings were consistent with a diagnosis of acute myeloid leukemia (AML). Another dominant CD45 negative population, presumably plasma cells, was also present. On immunohistochemistry, the plasma cells were found to be kappa restricted. The cytogenetic analysis revealed metaphases with 46 XY karyotype and translocation t(8;21) [6]. We were unable to determine if both the myeloma and leukemia cells showed the same cytogenetic abnormalities.

The patient thus fulfilled the diagnostic criteria of both multiple myeloma and AML. The patient developed septicemia on the 7th day of the admission, and was discharged on request.

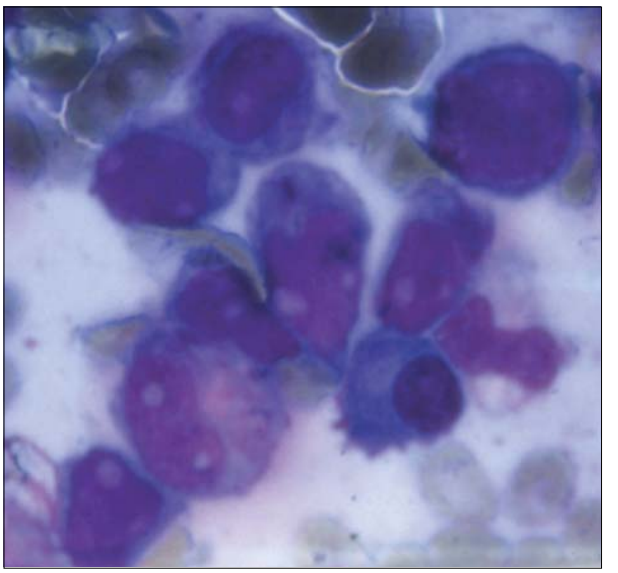

Figure 1. Bone marrow examination demonstrating double neoplastic cell population. The neoplastic plasma cell shows an eccentric nucleus and abundant cytoplasm. Myeloblasts show large nuclei with prominent nucleoli.

DISCUSSION

In most cases where both AML and multiple myeloma have been described in the same patient, acute leukemia usually follows institution of alkylating therapy for multiple myeloma1. Only rare cases of simultaneous occurrence of these two malignancies unrelated to chemotherapy have been reported. In the presentation of a recent case [1], a review until 2003 revealed only nine cases, and PUBMED and MEDLAR searches to date showed no new cases; therefore, we suggest our case to be the 11th such reported case[2]. Most of these have been shown to be myelocytic or myelomonocytic in type [3], and severalpathophysiological mechanisms have been proposed in explanation. These include a disorder of multipotent stem cells [1,2,3] exposure to common environmental risk factors[1] and repeated infections, and repeated infections in a patient of multiple myeloma, which might result in the development of a leukemic clone [4]. Another explanation may be that multiple myeloma is a slowly evolving disease with a resultant decrease in immune surveillance; incipient leukemic clones might escape the same and present concurrently [4].

In the cases where there is no elevation of serum immunoglobulin levels, the presence of mature plasma cells cannot be considered as a diagnostic criterion for multiple myeloma since paracrine growth stimulation of plasma cells by interleukin (IL)-6 production by leukemic blast

cells may contribute to the plasmacytosis observed in some patients with AML[5].

Multiple myeloma is characterized cytogenetically by 14q32 rearrangements -13/13q - and various trisomies. Occasionally, karyotypic patterns characteristic of myelodysplastic syndrome (MDS) or AML may occur in patients with multiple myeloma. These may signify therapy-related (t)-MDS/tAML. In an important analysis, a comparison of cytogenetic features in multiple myeloma (n = 993) and t-MDS/t-AML post-multiple myeloma (n = 117) was made[6]. It revealed significant differences in the complexity and ploidy levels in most genomic changes. These features can be used to distinguish between multiple myeloma and t-MDS/t-AML. Rarely, myeloid-associated aberrations are detected in multiple myeloma without any signs of MDS/AML, the significance of which is not known.

As the number of patients with simultaneous AML and multiple myeloma is very small, there is no established treatment of choice. Allogenic stem cell transplant probably remains the best option where feasible. Where transplant is not an option, we feel that chemotherapy for AML should be tried, as AML is more aggressive and life-threatening than multiple myeloma and because anthracyclines have efficacy against the myeloma cells as well.

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