# Generalized neutrophilic dermatosis: A rare presentation of myelodysplastic syndrome

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# Abstract

We present a 30-year-old man admitted with generalized cutaneous lesions, fever and cough.

Examination of skin biopsies of a papular lesion revealed dense neutrophilic infiltration of the upper dermis, so these lesions were diagnosed as neutrophilic dermatosis.

Peripheral blood examination and bone marrow findings confirmed the diagnosis of myelodysplastic syndrome with excess blasts.

The cutaneous lesions improved after administration of corticosteroid and follow-up bone marrow examination revealed a normocellular marrow.

One year later he referred with acute myelogenous leukemia (AML-M0). Unfortunately, he did not respond to treatment and died a few months later due to disease progression.

Key Words: Sweet's syndrome, neutrophilic dermatosis, myelodysplastic syndrome

# Introduction

Myelodysplastic syndrome (MDS) refers to a group of clonal stem cell disorders characterized by maturation defects, resulting in ineffective hematopoiesis and an increased risk of transformation to AML.

Some patients with MDS develop skin eruptions. These lesions are classified as either specific or nonspecific.<sup>[1]</sup> Specific leukemic infiltrates, often referred to as leukemia cutis, and non-specific inflammatory lesions, historically called leukemids, include dermal vasculitis, cutaneous infections, neutrophilic dermatosis and panniculitis. Based on previous reports neutrophilic dermatosis occurs as single or multiple skin eruptions during the course of the disease or treatment. But developing as generalized lesions which precedes other findings has not yet been reported.

We describe a patient with MDS who developed

generalized neutrophilic dermatosis as a presenting symptom.

# **Case History**

A 30-year-old man, non-smoker, with no significant previous medical illness, admitted to our hospital with skin lesions of one month duration and two weeks history of dry cough and fever. The patient's drug history was not informative.

On physical examination body temperature was 38.7C and numerous tender, erythematous-based, vesiculopapular and postular lesions were detected on the face, chest wall, upper extremities, anterior and posterior trunk and proximal lower extremities, some of which were crusted or ulcerated (Figure 1). No mucosal involvement was present. On chest examination, breathing sounds were decreased at both lung bases. There was no palpable lymphadenopathy or hepatosplenomegaly.



Figures 1a and 1 b: Erythematous-based, vesiculopapular and postular lesions on chest and abdomen

The initial laboratory investigation yielded the following results: Hgb: 8.9 gr/dl, Plt:  $180 \times 10^{9}/L$ , WBC:  $7.8 \times 10^{9}/L$ , with a differential count of 85% neutrophils and 10% lymphocytes and ESR: 55 mm/h.

Chest X-ray showed bilateral lower lobes infiltration.

Gram stain and tissue culture examinations from a bulla were negative for microorganisms.

Skin biopsy of a papule demonstrated irregular acanthosis, spongiosis and upper dermal infiltration of acute and chronic inflammatory cells which was accompanied by exocytosis and dense neutrophilic infiltration, and the lower dermis showed perivascular lymphocytic infiltration, so these lesions were identified as neutrophilic dermatosis (Figure 2).

Peripheral blood examination showed leukoerythroblastic reaction with nuclear hypo- or hypersegmentation of neutrophilic series, accompanied by 5% myeloblasts.

Considering persistent fever and appearance of blasts in peripheral blood, bone marrow examination was performed. Microscopic examination revealed marked hypercellular marrow with dysmyelopoietic changes and increased percentage of myeloblasts, which account for 15% of marrow cells.

Systemic antibiotics (cloxacilin and ceftazidim) were started but the skin lesions were resistant to antibiotic therapy. After a week, based on the pathology report of neutrophilic dermatosis, prednisolone (60 mg/day) was administered.

After 20 days, the patient responded dramatically and most of the skin lesions disappeared completely;

therefore he was discharged from the hospital with oral prednisolon (20 mg/day). On follow-up, bone marrow examination was normocellular.

One year later he referred with high-grade fever, fatigue, weakness and anorexia. Routine laboratory evaluation showed anemia (Hb: 10.8 gr/dl), leukocytosis (WBC:123x10<sup>9</sup>/L) with 30% blasts and low platelet ( $78x10^{9}/L$ ) count. Bone marrow examination revealed marked hypercellular marrow containing more than 90% myeloblasts which were negative for all cytochemical stains (MPO, SBB, NSE and PAS).

Immunophenotyping showed CD 45 positive leukemic



Figure 2: Skin biopsy showing upper dermal dense neutrophilic infiltration

blasts cells (98.3%) which expressed progenitor antigen CD 38 (96.7%), stem cell antigen CD34 (65%) and cytoplasmic myeloperoxidase (80%). These findings were consistent with minimally differentiated acute myelogenous leukemia (AML-M0). Unfortunately, the patient was unresponsive to routine chemotherapy (7+3 regimen) and died of disease within a few months.

## Discussion

Myelodysplastic syndrome (MDS) is characterized by morphological abnormalities of erythroid and granulocytic cells in bone marrow and peripheral blood. Some patients with MDS develop eruptions which resemble Sweet's syndrome and pyoderma gangrenosum.<sup>[2]</sup> Sweet's syndrome (SS) was first described in 1964. The disorder is characterized by a constellation of symptoms and findings: fever, neutrophilia, erythematous and tender skin lesions that typically show an upper dermal infiltrate of mature neutrophils, and prompt improvement of both symptoms and lesions after the initiation of treatment with systemic corticosteroids.<sup>[3]</sup> The neutrophilic infiltrates of SS, characteristically involve the upper half of the dermis but middle and deep dermal and also subcutaneous adipose involvement are also described.<sup>[4]</sup>

In our patient, histological examination of skin lesions showed dense interstitial neutrophilia in the superficial to mid-dermis, therefore, the combined clinical and histological findings confirmed the diagnosis of neutrophilic dermatosis.

In 20-40% of the cases of neutrophilic dermatosis a malignancy is found.<sup>[5]</sup> Reported associated disorders are lymphomas,<sup>[6]</sup> MDS,<sup>[5]</sup> myeloid malignancies<sup>[7]</sup> and multiple myeloma.<sup>[8]</sup>

There are a few reports of MDS developing neutrophilic dermatosis as single or multiple cutaneous lesions during the course of the disease or treatment, but our patient developed generalized neutrophilic dermatosis as a presenting symptom. The pathogenesis of neutrophilic dermatosis associated with MDS is still unknown. An abnormal neutrophil chemotactic activity that causes uncontrolled release of proinflammatory mediators, in an unsuccessful attempt to restore the immunological balance, may be a possibility.<sup>[9]</sup> Erythropoietin has also been reported to cause neutrophilic dermatosis<sup>[10]</sup> but our case did not receive such treatment.

In conclusion, it is important to know that sometimes only a subjective symptom, such as cutaneous eruptions can precede the diagnosis of MDS, and as in our case, neutrophilic dermatosis can present itself as generalized skin lesions. In patients with these lesions, careful workup for hematological malignancies is crucial, and it seems that they are related with a more advanced and refractory disease course.

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