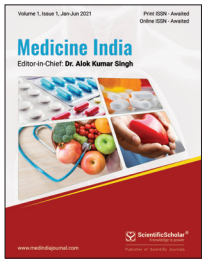
ScientificScholar®
Knowledge is power
Publisher of Scientific Journals

https://medindiajournal.com

Medicine India



Case Report

Acute neutrophilic dermatitis in a neutropenic patient – An uncommon presentation of sweet syndrome

Sangeetha Isaac[1], Joud Jarrah[2], Pranatharthi Chandrasekar[2]

[1]North Alabama Medical Center, Florence, Alabama, [2]Department of Internal Medicine, Division of Infectious disease, Wayne State University, Detroit, Michigan, United States.

***Corresponding author:**
Sangeetha Isaac,
North Alabama Medical Center,
Florence, Alabama,
United States.

sangeethapisaac@gmail.com

Received : 11 February 2023
Accepted : 21 February 2023
Published : 31 March 2023

DOI
10.25259/MEDINDIA_8_2023

Quick Response Code:

ABSTRACT

Sweet syndrome (SS) is an uncommon acute febrile neutrophilic dermatosis. Patients present with acute febrile illness, neutrophilia, and tender skin lesions. It is subclassified into idiopathic, malignancy associated, and drug induced. Occasionally neutrophilia may be absent in patients who are neutropenic secondary to malignancy, drugs, and congenital neutropenia. We describe a 70-year-old gentleman presenting with febrile neutropenia and SS. We have also reviewed the previously described reports of neutropenia and SS form literature.

Keywords: Sweet syndrome, Acute myeloid leukemia, Neutrophilic dermatitis, Neutropenia, Hematological malignancy

INTRODUCTION

Sweet syndrome (SS) is defined as an acute febrile neutrophilic dermatosis, which can be subclassified as classical, drug induced, and malignancy associated. Malignancy associated SS is commonly associated with hematological malignancy, acute myeloid leukemia (AML) being the most common. Occasionally neutrophilia may be absent in neutropenic patients; hence, it is important to consider SS in patients presenting with rash, even in this subgroup of patients. Here, we discuss a patient with febrile neutropenia, presenting with SS.

CASE REPORT

A 70-year-old Caucasian gentleman was diagnosed to have AML. He received induction chemotherapy with cytarabine and daunorubicin and was recently started on midostaurin, a multi-targeted protein kinase inhibitor. Post chemotherapy he developed pancytopenia requiring platelet transfusion in outpatient. During the transfusion, he developed an acute onset transfusion reaction and was admitted to the oncology services for further management. At the time of admission, his temperature was 101.4 F and his heart rate was 102/min. Remaining vitals were within normal limits. On examination, he had a few pinpoint petechiae scattered over his extremities. Systemic examination was normal. His white blood cell count was 600/mL, with differential neutrophil count of 51. His hemoglobin was 8 mg/dL and his platelet count was 11,000/mL. His electrolytes and renal function test were normal. While in the hospital, he had worsening neutropenia and his absolute neutrophil count hit a nadir of zero. In view of the persistence of fever, he was empirically treated for febrile neutropenia with cefepime

and vancomycin. On the day of initiation of antibiotics, he developed a rash with multiple discrete non-tender, bright, erythematous, papulonodular lesions scattered over the torso, extremities, buttocks, and groin. There were no oral or genital lesions. A skin biopsy was performed, awaiting the results of which his antibiotics were changed from cefepime to aztreonam. Serial blood cultures and urine cultures were obtained.

Histopathology revealed nonspecific neutrophilic dermatitis, confirming the diagnosis of SS. He was started on corticosteroids with rapid resolution of the rash and was continued on tapering therapy over 6 weeks. He remained afebrile for 48 h and cultures were sterile. Empirical antibiotics were discontinued and he was discharged on prophylactic ciprofloxacin, fluconazole, and acyclovir, as he continued to be neutropenic.

DISCUSSION

SS also known as acute febrile neutrophilic dermatosis is a rare inflammatory condition presenting with acute onset of febrile illness, neutrophilia, and painful skin lesions with dense infiltrate of mature neutrophils in the upper dermis. It was first described by Dr. Robert Douglas Sweet in 1964.[1] It was initially referred to as Gomm-Button disease in honor of the first two patients of the same. Etiologically, it is divided into three specific entities, namely, classical, malignancy associated, and drug associated SS.[2] Diagnosis is established based on the presence of two major criteria including (1) sudden onset painful, erythematous plaques, and nodules and (2) histopathological evidence of dense neutrophilic infiltrate without any evidence of leukocytoclastic vasculitis. Diagnosis also requires two of the four minor criteria including, (i) fever of 100.4°F, (>38°C), (ii) associations with an underlying illness known to be associated with sweets (Hematologic, visceral malignancy, inflammatory bowel disease, pregnancy, preceding upper respiratory tract infection, gastrointestinal tract infection, and vaccination), (iii) excellent clinical response to systemic corticosteroids and potassium iodide, (iv) 3 or 4 abnormal laboratory values at presentation including erythrocyte sedimentation rate (ESR) >20 mm/h; positive C-reactive protein (CRP); >8000/μL leukocytes; and >70% neutrophils.[3,4] Our patient fulfilled two major criteria and three minor criteria.

Pathogenesis of SS is multifactorial and varied among the three subtypes. Events like an autoimmune condition or a malignancy lead to increased production of colony stimulating factors including granulocyte colony-stimulating factor (G-CSF). G-CSF leads to increased neutrophil proliferation and maturation in serum, tissue, and bone marrow.[5] This also explains the etiology of drug induced SS with the administration of G-CSF in pancytopenic patients. This postulate is supported by the fact that serum G-CSF level has been shown to correlate directly with disease severity in many patients.[5-7] The finding of dermal neutrophils exhibiting genetic abnormalities similar to malignant myeloblast in bone marrow has led to the postulate that these cells arise as a result of the clonal transformation of dysplastic neutrophils. Infection- and drug-induced SS is thought to be secondary to a cytokine cascade stimulated by an inciting agent.[5,8]

SS has been reported in all the age groups, classical sweets are usually seen in women between the age of 30 and 60.[9] Patients are classically present with fever, which is followed by the presence of skin lesions and other systemic involvement. Elevated inflammatory markers such as Erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) are consistently seen. Peripheral neutrophilia though common may not be seen in patients with pancytopenia secondary to hematological malignancy and congenital neutropenia.[1,2,10,11] We did a literature review of all reports of sweets syndrome and neutropenia in the PubMed database. There were 22 patients with the above. The age of the patients ranged from 20 to 77 years. The most common cause of neutropenia in patients with sweets was malignancy.[8,12] The most common malignancy associated was AML seen in 16 patients, followed by chronic myeloid leukemia in blast crisis and myeloproliferative disorder in one patient each.[7,8,12] Other rarer causes were congenital agranulocytosis and Fanconis anemia seen in 3, 1 patients simultaneously.[13-15] Most of these patients had received G-CSF.

The presence of vesicles, bullaes, ulcers, and widespread lesions are commonly seen in malignancy associated sweets syndrome.[15-17] The onset of SS in patients of pediatric age group requires investigation to rule out the presence of malignancy and other systemic illnesses. Since it is a diagnosis of exclusion, tissue culture and blood culture is required to rule out the presence of infection. Systemic steroids are the drug of choice in SS. Response to systemic steroids is optimal with a prompt improvement of clinical and laboratory parameters on initiation.[9,10] Other drugs that have been successfully used include potassium iodide, colchicine, dapsone, cyclosporine, and clofazimine.[1,5] Recurrence is reported to occur along with recurrence of malignancy.

CONCULSION

In conclusion, the index of suspicion of SS should be high in patients presenting with acute febrile illness with tender skin lesions even in the absence of peripheral neutrophilia.

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Brown-Joel ZO, Vidal NY, Wanat KA. Expanding Purpura in a neutropenic patient. JAMA Oncol 2017;3:1276-7.
2. Berg I, Nenninger T, Dimaio D, Bierman P, Sandkovsky U. Rash and ear swelling in a patient with febrile neutropenia. Int J Infect Dis 2013;17:e360-1.
3. Roengvoraphoj M, Yan S, Lansigan F, Chapman MS, Danilov AV. Acute inflammatory skin reaction during neutrophil recovery after antileukemic therapy. Cutis 2016;98:E13-5.
4. Guillet S, Stokkermans J, Vergier B, Doutre MS, Beylot-Barry M. Acute neutrophilic dermatosis (pustular dermatitis) associated with aggressive transformed mycosis fungoides. Ann Dermatol Venereol 2013;140:635-40.
5. Frontiers Insights into the Pathogenesis of Sweet's Syndrome Immunology. Available from: https://www.frontiersin.org/articles/10.3389/fimmu.2019.00414/full [Last accessed on 2019 Aug 17].
6. Arbetter KR, Hubbard KW, Markovic SN, Gibson LE, Phyliky RL. Case of granulocyte colony-stimulating factor-induced Sweet's syndrome. Am J Hematol 1999;61:126-9.
7. Ozaki S, Funasaka Y, Takubo M, Matayoshi T, Ueno T, Asayama T, *et al*. Granulocyte colony-stimulating factor-induced granulomatous dermatitis with enlarged histiocytes clinically manifesting as painful edematous nodules with high fever similar to Sweet's syndrome. J Dermatol 2015;42:414-7.
8. Ozcelik T, Ozkocaman V, Ali R, Ozkalemkas F, Bulbul-Baskan E, Yazici B, *et al*. Sweet's syndrome: Dilemma in febrile neutropenic patient with acute myeloid leukemia. Leuk Res 2006;30:1466-8.
9. Llamas-Velasco M, García-Martín P, Sánchez-Pérez J, Fraga J, García-Diez A. Sweet's syndrome with subcutaneous involvement associated with pegfilgrastim treatment: First reported case. J Cutan Pathol 2013;40:46-9.
10. Chao SC, Lee JY, Tsao CJ. Sweet's syndrome in a severely neutropenic patient during therapy with recombinant human granulocyte colony-stimulating factor. J Formos Med Assoc 1997;96:276-9.
11. Probert C, Ehmann WC, Al-Mondhiry H, Ballard J, Helm KF. Sweet's syndrome without granulocytosis. Int J Dermatol 1998;37:108-12.
12. Paydas S, Sahin B, Zorludemir S. Sweet's syndrome accompanying leukaemia: Seven cases and review of the literature. Leuk Res 2000;24:83-6.
13. Richard MA, Grob JJ, Laurans R, Hesse S, Brunet P, Stoppa AM, *et al*. Sweet's syndrome induced by granulocyte colony-stimulating factor in a woman with congenital neutropenia. J Am Acad Dermatol 1996;35:629-31.
14. Chatham-Stephens K, Devere T, Guzman-Cottrill J, Kurre P. Metachronous manifestations of Sweet's syndrome in a neutropenic patient with Fanconi anemia. Pediatr Blood Cancer 2008;51:128-30.
15. Draper BK, Robbins JB, Robbins JR, Stricklin GP. Bullous sweet's syndrome in congenital neutropenia: Association with pegfilgrastim. J Am Acad Dermatol 2005;52:901-5.
16. Akilov OE, Desai N, Jaffe R, Gehris RP. Bullous Sweet's syndrome after granulocyte colony-stimulating factor therapy in a child with congenital neutropenia. Pediatr Dermatol 2014;31:e61-2.
17. Liu CI, Hsiao CH, Wu JT, Tsai TF. Sweet syndrome with histiocytoid infiltrate and neutropenia: A rare combination. J Am Acad Dermatol 2009;61:882-4.

How to cite this article: Isaac S, Jarrah J, Chandrasekar P. Acute neutrophilic dermatitis in a neutropenic patient – An uncommon presentation of sweet syndrome. Med India 2023;2:9.