

# Case Reports

## Sweet Syndrome: A Rare Skin Disorder in Children

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### Abstract

*Sweet syndrome (SS) is a rare dermatosis of unknown etiology. It is characterized by fever, neutrophilia, raised and painful plaques on the skin of the face, neck, limbs, and histologically by dermal infiltration of neutrophils. Here, we present a ten-year-old boy who presented with fever and multiple skin lesions for 15 days. On examination, he was febrile and presented with multiple nodular, tender, erythematous rash on face and limbs. Laboratory findings revealed raised inflammatory markers with neutrophilic leukocytosis, skin biopsy showed hyperkeratosis and neutrophilic infiltration of the dermis. Typical history, laboratory investigations including skin biopsy findings were suggestive of diagnosis of SS. Prolonged fever and characteristics skin lesions in any child should be suspected for this rare syndrome. It should be kept in mind as a differential diagnosis in the day-to-day clinical practice for effective management of this rare disease.*

**Keyword:** Sweet syndrome (SS), Fever, Neutrophilic dermatosis

### Introduction

Sweet syndrome (SS) is also known as acute febrile neutrophilic dermatosis, was first described by Robert Douglas Sweet in 1964.<sup>1</sup> SS is characterized by fever, high neutrophil count in blood and tissue, leading to development of tender, erythematous inflammatory skin lesions (papules, nodules, plaques). It manifests in three clinical patterns: i) para-infectious SS (hypersensitivity reaction to specific infection), ii) paraneoplastic SS (usually associated with acute leukemia), and iii) drug-induced SS (adverse reaction to certain drugs).<sup>2</sup> Histologically, dense dermal neutrophilic inflammatory infiltrate associated with sub-epidermal edema is essential for diagnosis of this syndrome.<sup>3</sup> The pathogenesis is not known precisely. It has been proposed that triggering factors increase the release of pro-inflammatory cytokine in target organs, leading to hypersensitivity and cause neutrophilic and histiocytic infiltration. Intensive infiltration with mature neutrophils is observed in the middle and upper dermis on histopathological examination of the skin lesion.<sup>3</sup>

The syndrome may resolve either spontaneously or after medication. Systemic corticosteroids are

considered as the gold standard treatment.<sup>5</sup> Recurrence is not uncommon and considered as the most common complication. SS in children is more resistant to corticosteroid than adults and a longer duration of treatment is required (up to 5 months) to prevent recurrence. In resistant cases, indomethacin, cyclosporin, dapsone, clofazimine or other immunomodulating drugs are the treatment alternatives.<sup>6</sup> SS is a very rarely diagnosed case in children. Current literature reported less than 70 cases of SS in the children age group.<sup>7</sup>

### Diagnostic criteria for Sweet syndrome<sup>4</sup>

Major	<ul style="list-style-type: none"> <li>• Abrupt onset of nodules or painful erythematous plaques</li> <li>• Histopathologic evidence of dense neutrophilic infiltrates in the dermis</li> </ul>
Minor	<ul style="list-style-type: none"> <li>• Fever above 38°C</li> <li>• Infection of the respiratory tract or gastrointestinal tract preceding the medical condition or association with vaccination, inflammatory disease, neoplasia.</li> <li>• Presence of the following laboratory findings (3 of 4):</li> <li>• ESR &gt;20 mm; positive C reactive protein; leukocyte count &gt;8000/μl, neutrophil count &gt;70%</li> <li>• Excellent response to treatment with corticosteroids or potassium iodide</li> </ul>

\*\*Both major criteria and 2 of the 4 minor criteria are needed for diagnosis.

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**Case Report:**

10 years old boy was admitted in the pediatric ward of Bangabandhu Sheikh Mujib Medical University with high-grade intermittent fever for 21 days. The highest recorded temperature was 104<sup>0</sup>F. He also developed skin rash which initially appeared over the face and chest then extensively involved both the upper and lower limbs. The rash was erythematous, nodular, painful and non-pruritic. He had no history of photosensitivity, oral ulcer, bleeding manifestation, contact with TB patient or taking any offending drugs. He was treated with intravenous antibiotics and oral antihistamine without significant improvement. On examination, the boy was febrile and mildly pale. Other vitals were within normal limit. Skin survey revealed multiple nodular, tender, non-blanching, erythematous rash distributed all over the body but more marked on both the upper and lower limbs. Systemic examination was normal.



**Fig.-1:** Showing multiple erythematous, nodular and papular rash of variable size over lower limbs

Investigation showed low Hb (9.8 gm/dl), blood film had microcytic hypochromic anemia, high total count (20,000/mm<sup>3</sup>) with neutrophilic predominance (83%). Both the erythrocyte sediment rate (ESR) and C-reactive protein (CRP) were significantly high. Septic screenings, x-ray chest and bone marrow study were also normal. Serological markers including Anti-nuclear antibody and anti-ds DNA were negative and complements (C<sub>3</sub>, C<sub>4</sub>) were normal. Skin punch biopsy showed hyperkeratosis, neutrophilic exocytosis with small pustule formation in the epidermis and perivascular infiltration with inflammatory cells in the dermis which was consistent with sweet syndrome.

From history, examination findings and investigations diagnosis of SS was confirmed and we treated the boy with oral prednisolone (1mg/kg/day). Significant improvements of cutaneous lesions were observed and the boy became afebrile within 3 day of treatment. He was discharged and followed up for six months. Skin lesions were completely healed and no new lesions appeared. After 1 month of treatment, steroid was gradually tapered off over next 5 months.

**Discussion**

Sweet syndrome is a rare disease in the pediatric age group with a slight male predominance in children less than 3 years of age. The mean age of diagnosis is 5 years among pediatric cases.<sup>8,9</sup> Classic idiopathic Sweet syndrome is relatively more common in children and about 42% of the pediatric patients are reported from this group.<sup>6,10</sup> Though it is mostly idiopathic; infections, vaccines, drugs, immune deficiency, connective tissue diseases (Systemic lupus erythematosus, Dermatomyositis) and neoplastic diseases (acute myelocytic leukemia) are also responsible for this syndrome.<sup>10-12</sup> No known etiology was found in our case.

Swetha P et al. presented two cases of SS. A 4-year-old girl with fever, features of upper respiratory infection, abdominal pain and multiple skin lesions of 10 days duration. Another case, an 8 month old baby boy presented with fever and multiple skin lesions of 20 days. In both the cases, they had papules and plaques with elevated borders all over the body.<sup>13</sup> Age of our case was 10 year with similar picture. As observed in our patient, the lesions had acute onset, in the form of painful, sharply circumscribed erythematous nodules of different shapes and sizes (Figure 1).

Lab investigations of the first case presented by Swetha P et al. revealed low hemoglobin (9.8 mg/dl),

raised total leucocyte count (26,000 cells/dl) with neutrophilic predominance (80%) and bone marrow study was normal. Acute phase reactant - ESR (40 mm/1st hr) and CRP (40 mg/L) were high. Skin biopsy showed dense infiltrate in the upper dermis, consisted mainly of neutrophils with no evidence of vasculitis.<sup>13</sup> All the above mentioned lab investigations were consistent with our reported case.

Skin findings of Sweet syndrome should be differentiated from the other neutrophilic dermatoses (CANDLE syndrome, erythema multiforme, erythema nodosum, leukocytoclastic vasculitis and infections).<sup>5</sup> In this case initially the skin lesions were evaluated as erythema nodosum but characteristics lab and skin biopsy findings excluded erythema multiforme, erythema nodosum and leukocytoclastic vasculitis like conditions. CANDLE syndrome, an early onset auto-inflammatory disease/syndrome is a strong differential diagnosis of Sweet syndrome. But the characteristic findings of Candle syndrome including recurrent fever episodes, multiple skin lesions, arthralgia/arthritis, specific facial changes, progressive lipodystrophy and hepatosplenomegaly were absent in this boy.<sup>14</sup> Though both the syndromes presents with recurrent fever, skin lesions with neutrophilic dermatosis but facial changes, lipodystrophy, organomegaly and arthritis are absent in sweet syndrome. Our patient had fulfilled the diagnostic criteria of SS including 2 major and 3 minor criteria (Major criteria- characteristic skin findings, histopathologic evidence of neutrophilic dermatosis and minor criteria- fever, raised inflammatory markers, response to steroid).

With the corticosteroid treatment, symptoms get better quickly, but recurrence of symptoms can occur in 20-30% of the cases.<sup>12</sup> It has been reported that use of colchicine or potassium iodide alone or in combination with steroids may give satisfactory results.<sup>15</sup> We successfully treated our patient with only oral prednisolone.

### Conclusion

Sweet syndrome is an uncommon dermatosis in the pediatric age group, therefore a high index of suspicion to be considered in the presence of fever associated

with persistent skin lesions. Evaluation for neoplastic disorders, infections, inflammatory conditions and immunodeficiencies should be carried out to identify the etiology. Careful monitoring of the clinical course and treatment response in SS cases should be done to reduce the morbidity of this illness.

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