

MENINGOCOCCAL SEPTICEMIA WITH CUTANEOUS VASCULITIS

Radha Mittal and Raminder Popli

Two cases had meningococcal septicemia with vasculitis of skin. One 9-year-old female developed generalised, asymptomatic, purpuric, atrophic plaques on the limbs, trunk and face on the fourth day of high fever. The second patient was 20-year-old male who developed purplish plaques, nodules and bullae mainly on the extensor surfaces of the hands and feet on the tenth day of high fever. Bullae had clear fluid and bluish-black peripheral rim.

Key words : Meningococemia, Skin lesions.

In fulminating infections with *Neisseria meningitidis*, fever is brief and the infection is divided into septicemic and meningitic stages. In the septicemic stage, purpuric plaques of variable sizes and number are characteristically seen on the trunk and limbs. Rarely, another type of a lesion in the form of solitary or multiple nodules and bullae may appear on the limbs, five to nine days after the onset of illness even if adequate antibiotic treatment has been given.¹

Histopathology of petechiae demonstrates thrombi composed of neutrophils, platelets and fibrin in dermal vessels. Many meningococci are seen in luminal thrombi, within the vessel walls and around the vessels as Gram negative diplococci.² In addition, acute leukocytoclastic vasculitis with damage to the vessel wall and haemorrhages can occur.³ Intra-epidermal and sub-epidermal pustules filled with neutrophils may also be seen.⁴ Cutaneous lesions in the form of purpura, maculo-papular and faint-pink macules were reported in acute meningococemia.⁵

Case Reports

Case 1

One 9-year-old female had high grade fever, headache, diarrhoea, vomiting and was diagnosed as a case of meningococemia. On the

fourth day of fever, the patient developed numerous, discrete, asymptomatic, purpuric plaques on the limbs, trunk and face (Fig. 1). Purpuric plaques had central atrophy and some had superficial gangrenous changes. Plaques appeared all over the body within one day and remained static for 18 days. Mucous membranes, hair and nails were normal.

Her haemoglobin was 11.5 gm %, TLC 8800 and DLC P74, L20, M3, E3%. Urine and stools were normal. Fasting blood sugar was 120 mg %. Serum creatinine was 1.2 mg %. Blood urea was 64 mg but returned to 40 mg after four days. ECG was normal. Serum sodium was 130 mEq and serum potassium was 3.5 mEq. CSF



Fig. 1. Purplish atrophic plaques on the face.

From the Departments of Dermatology and Pathology, Government Medical College and Rajendra Hospital, Patiala-147 001, India.

Address correspondence to : Dr R R Mittal.

had proteins 600, globulins 4+, sugar 30 mg %, chloride 40 mEq and 30-40 pus cells/HPF. Polymorphs and a few lymphocytes were seen. No organisms were detected on Gram staining. CSF culture showed no growth of organisms. Biopsy of skin revealed meningococci and vasculitis consistent with the diagnosis of meningococcal septicemia.

Case 2

A 20-year-old male had high grade fever and vomiting and became unconscious on the third day of fever. He was diagnosed as a case of pyogenic meningitis and was treated with penicillin and gentamicin leading to marked improvement. On the tenth day of fever, the patient developed purpuric plaques, nodules and bullae mainly on the dorsum of hands and feet. Purpuric plaques varied from 1 to 1.25 cm in diameter and had central atrophy. Bullae had clear fluid with a peripheral bluish-black rim (Fig. 2). A few bigger bullae in addition had central bluish-black discoloration and an angular outline. Black crusts covered a few plaques. Mucous membranes, nails and hair were normal.

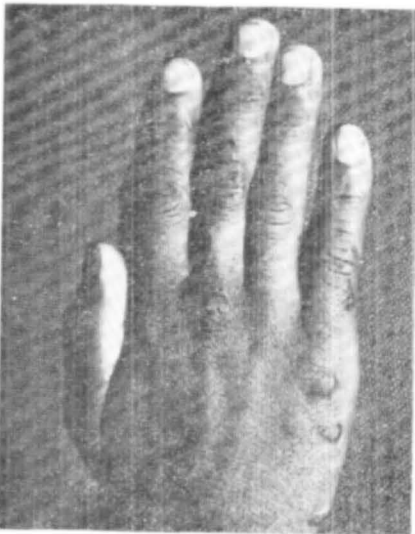


Fig. 2. Bullae with clear fluid in the centre and peripheral bluish-black rim.

His haemoglobin was 10.5 gm %, TLC 10,650/cmm and DLC P70, L24, M2 and E4%. CSF had proteins 450, globulins 4+, sugar 20 mg %, chloride 112 mEq and pus cells 4+. Polymorphs and a few lymphocytes were seen. No organism was seen on Gram stain. Biopsy report was vasculitis, intra-epidermal and sub-epidermal pustules filled with neutrophils. Diplococci were seen. Gram staining confirmed the presence of Gram negative diplococci. Culture of CSF and blood showed no growth of organisms.

Comments

Both patients had purpuric plaques and bullae typical for meningococcal septicemia. Whittle et al in 1973⁶ also reported similar lesions. Typical histopathological changes were seen in the form of haemorrhage, leukocytoclastic vasculitis and thrombi in the dermal vessels. Gram negative diplococci were present in and around the blood vessels. In addition, intra-epidermal and sub-epidermal pustules filled with neutrophils were also seen. Greenwood et al⁷ could not locate meningococci but detected meningococcal antigen on immunofluorescent staining in cases of meningococcal septicaemia. Presence of circulating antibodies and marked fall of C3 levels led them to conclude that arthritis and cutaneous lesions in their cases could be due to immune complex formation or Arthus phenomenon. Meningococcal toxins and endotoxins were responsible for microthrombi and vasculitis in meningococcal septicemia.²

The cutaneous lesions in acute meningococcaemia probably result from direct damage to capillaries and post-capillary venules. Organisms are found in swollen endothelial cells, in polymorphonuclear leukocytes in the inflammatory reaction, and trapped in fibrin thrombi in the vessels. These features are also consistent with the dermal Schwartzman reaction, but the finding of immunoglobulins and complement in

the walls of involved vessels argues for an immunological active process as well.⁸

References

1. Roberts SOB and Hight AS : Bacterial infections, in : Textbook of Dermatology, Fourth ed, Editors, Rook A, Wilkinson DS, Ebling FJG et al : Oxford University Press, Bombay, 1987; p 755.
2. Lever WF and Schaumburg-Lever G : Bacterial diseases, in : Histopathology of the Skin, Sixth ed, JB Lippincott Company, Philadelphia, 1983; p 294.
3. Hill WR and Kinney TD : The cutaneous lesions in acute meningococcaemia, J Amer Med Assoc, 1947; 134 : 513-518.
4. Shapiro L, Teisch JA and Brownstein MH : Dermatohistopathology of chronic gonococcal sepsis, Arch Dermatol, 1973; 107 : 403-406.
5. Ramesh V, Ramji S, Sehgal SK et al : Cutaneous involvement in acute meningococcaemia (Study of an epidemic in Delhi), Ind J Dermatol Venereol Leprol, 1987; 53 : 264-266.
6. Whittle HC, Abdullahi MT, Fakewile FA et al : Allergic complications of meningococcal disease. I. Clinical aspects, Brit Med J, 1973; 2 : 733-737.
7. Greenwood BM, Whittle HC and Bryceson AD: Allergic complications of meningococcal disease. II. Immunological investigations, Brit Med J, 1973; 2 : 737-740.
8. Weinberg AN and Swartz MN : Gram negative coccal and bacillary infections, in : Dermatology in General Medicine, Second ed, Editors, Fitzpatrick TB, Eisen AZ, Wolff K et al : Mc Graw-Hill Book Company, NewYork, 1979; p 1446-1449.