

An Unexpected Finding In a Child With Scarlet Fever: Hepatitis

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ABSTRACT

Hepatitis is an unexpected finding during course of scarlet fever (1, 2). A six years old boy who diagnosed scarlet fever and transient hepatitis. We aimed to remind that some infectious diseases like scarlet fever may also lead to hepatitis.

Keywords: Child, hepatitis, scarlet fever

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CASE PRESENTATION

A six years old boy admitted to our clinic with complaints of abdominal pain and vomiting as well as fever with rashes on trunk since five days. Dark urine was also available since 24 hours in addition to other complaints. First examination revealed tonsillitis with enlarged tonsils, painless, mobile, enlarged and bilateral cervical multiple lymph nodes, dry and rusty rashes on abdominal and genital area, fissures on upper and lower lips with 39 °C degree of axillary temperature. The liver was also enlarged to 2 cm below right arcus on abdominal examination.

Laboratory evaluation showed elevated levels of liver transaminases, total and direct bilirubins, gamma glutamyl transpeptidase (GGT), alkaline phosphatase (ALP), erythrocyte sedimentation rate (ESR) and C reactive protein (CRP) [ALT 572 u/L and AST 496 u/L, total bilirubin 3.3 mg/dL and direct bilirubin 2.2 mg/dL, ESR 35 mm/h and CRP 26 mg/L, GGT 347 u/L and ALP 475 u/L]. Antistreptolysin O titer was also increased 406 IU/mL then up to 650 IU/mL. Albumin and total protein level was decreased 3.1 mg/dL and 5.5 mg/Dl, respectively. White blood cell (WBC) level was $14.3 \times 10^3/\mu\text{L}$ and prothrombin time were within normal range. A throat swab culture and blood culture was obtained then dose of 50 000 IU per kilogram crystallized penicillin started every six hours.

Serum immunoglobulins M and G antibodies measurement against hepatitis A, B, C, Epstein-Barr Virus, Cytomegalovirus, Parvovirus B19, Toxoplasma Gondii was found negative. Ultrasound evaluation of abdomen only revealed mild hepatomegaly with normal parenchymal echogenicity of liver. Group A β -hemolytic *streptococci* strain was isolated from throat swab culture. Blood culture result were negative for microorganisms. On case's clinical course seven days after of admission wide desquamation on fingertips buttocks was observed (Figure 1).



Figure 1: Desquamations on fingertips and buttocks

His fever lasted to five days after the initial dose of antibiotherapy whereas abdominal pain and vomiting ameliorated on the 16th hours of admission. Laboratory abnormalities and hepatomegaly had been normalized on his clinical reevaluation after eighteenth day of initial symptoms.

DISCUSSION

Suppurative complications of GAS (Group A β -hemolytic streptococcus) infections include cervical lymphadenitis, peritonsillar abscess, retropharyngeal abscess, otitis media, mastoiditis and sinusitis. Nonsuppurative complications of these infections are known acute rheumatic fever and

acute poststreptococcal glomerulonephritis. Also poststreptococcal reactive arthritis and paediatric autoimmune neuropsychiatric disorder associated with streptococcus pyogenes (PANDAS) are related to GAS infections (3). Hepatitis is a rare complication of scarlet fever in paediatric age group (4). Scarlet fever related hepatitis cases was firstly reported by MacMahon and Mallory in 1931 (5). The pathophysiologic mechanism of condition is unclear. Direct bacterial injury, toxicity and immunologic mediation have been proposed. Liver biopsies in patients with scarlet fever have shown granulocytic infiltration of the portal areas and hepatocytic degeneration (6). Group A streptococcal pyrogenic exotoxins are believed to be central mediators of the systemic inflammation seen in severe streptococcal infections. These "superantigens" do not require processing by antigen-presenting cells and can interact with a variety of class II major histocompatibility complex molecules. The superantigen-MHC complex, in turn, interacts with T-cell receptors, eliciting cytokine responses and activating a large proportion of the immune cells (7). Endotoxins can activate hepatic macrophages and sinusoidal endothelial cells, leading to an excess secretion of cytokines and intrasinusoidal coagulation and thereby injuring hepatocytes (8). Elevated liver transaminases have also been in invasive GAS infections which is indicative of hepatic involvement (9). It is possible that HLA polymorphism influences the susceptibility to the superantigens. It has been proven that patients with severe and non-severe manifestations have a propensity to produce different levels of cytokine responses to the same superantigens, which may explain the inter-individual diversity of clinical manifestations observed in streptococcal infections (7).

An animal study showed that carried out by Goldmann *et al* immunologic response to bacteria and clearance of bacteria are important mechanism for organ damage in *streptococci* infections. The strong systemic immunologic response to GAS products and impaired capacity of bacterial clearance are more likely to form organ damage. Animal with these characteristics showed large hepatic ischaemia area and sequestered intense inflammatory cells within the liver sinusoid

and that mean increased ischaemia and extended hepatocellular damage (10). Jaundice was not common in scarlet fever hepatitis that ratio is 0.06% in an autopsy series (11). Post-mortem cultures of blood and lungs yielded beta-hemolytic *streptococci* while those of liver tissue did not, thus there is lack of evidence of direct bacterial liver tissue damage (12).

In conclusion, the patient had diagnosed scarlet fever depend on his clinical and laboratory evaluation. Because of his clinical and laboratory improvement was not prolonged and liver biopsy is an invasive method to evaluate transient hepatitis, it had not been performed for this case. It was an unexpected finding to meet hepatitis in this patient. We found it worth to present this unusual situation because it would be as a reminder for another reasons of hepatitis in childhood except of well-known hepatotropic virus.

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