CASE REPORT

An Unexpected Finding in a Child with Scarlet Fever: Hepatitis

H Kocamaz[1], S Işıkay[2], K Demirören[1], Y Doğan[1]

ABSTRACT

Hepatitis would be related to non-hepatotropic virus. A 6-year-old boy was presented with acute hepatitis finding. He had specific rashes for scarlet fever. His liver was enlarged and liver enzyme was elevated. Other reasons of acute viral hepatitis were excluded. Liver enzymes were normalized after appropriate antibotherapy. We aimed to remind unusual presentation of scarlet fever and uncommon reasons of acute hepatitis.

Keywords: Antibotherapy, child, hepatitis, scarlet fever

INTRODUCTION

Hepatitis is an unexpected finding during the course of scarlet fever (1, 2). However, we diagnosed a 6-year-old boy with scarlet fever and transient hepatitis. We aimed to remind readers of this article that some infectious diseases like scarlet fever may also lead to hepatitis.

CASE REPORT

A 6-year-old boy was admitted to our clinic (Department of Pediatric Gastroenterology, Firat University Hospital, Elazig, Turkey) with complaints of abdominal pain and vomiting as well as fever with rashes on his trunk since 5 days. His dark urine was also available since 24 hours in addition to other complaints. His first examination revealed tonsillitis with enlarged tonsils, painless, mobile, enlarged and bilateral cervical multiple lymph nodes, dry and rusty rashes on the abdominal and genital areas, and fissures on upper and lower lips and a temperature of 39°C per axilla. The liver was also enlarged to 2 cm below the right arcus based on his abdominal examination.

His 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) [alanine amino transferase 572 U/L and aspartate amino transferase 496 U/L, total bilirubin 3.3 mg/dL and direct bilirubin 2.2 mg/dL, ESR 35 mm/h, CRP 26 mg/L, GGT 347 U/L, and ALP 475 U/L]. His antistreptolysin O titre was also increased to 406 IU/ml and then up to 650 IU/ml. His albumin and total protein level were decreased to 3.1 mg/dL and 5.5 mg/dL, respectively. His white blood cell level was $14.3 \times 10^3/\mu L$ and prothrombin times were within the normal range. His throat swab culture and blood cultures were obtained, and then the dose of 50 000 IU per kilogram crystallized penicillin was started every 6 hours. His measurement of serum immunglobulin M and G antibodies against hepatitis A, B and C, Epstein-Barr virus, Cytomegalovirus, parvovirus B19, and *Toxoplasma gondii* was found to be negative. The ultrasound evaluation of his abdomen only revealed mild hepatomegaly with normal parenchymal echogenicity of the liver. Group A β-haemolytic streptococci strain was isolated from his throat swab culture. His blood culture results were negative for microorganisms. On the case's clinical course 7 days after his admission, wide desquamation on his fingertips and buttocks was observed (Figure).

His fever lasted 5 days after the initial dose of antibiotherapy, whereas his abdominal pain and vomiting ameliorated on the 16th hours of his admission. His laboratory abnormalities and hepatomegaly had been normalized on his clinical re-evaluation after 18 days of his initial symptoms.

From: [1]Department of Pediatric Gastroenterology, Firat University Faculty of Medicine, Elazığ, Turkey and [2]Department of Pediatric Neurology, Gaziantep Children's Hospital, Osmangazi Mahallesi, Şehitkamil, Gaziantep, Turkey.

Correspondence: Dr H Kocamaz, Department of Pediatric Gastroenterology, Faculty of Medicine, Pamukkale University, Denizli, Turkey. Email: drkocamaz@hotmail.com

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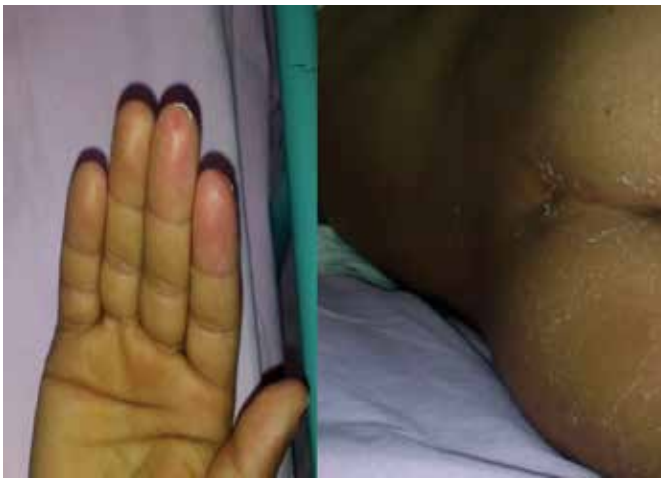

Figure: Desquamations on fingertips and buttocks.

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 PANDAS (paediatric autoimmune neuropsychiatric disorder associated with Streptococcus pyogenes) are related to GAS infections (3). Hepatitis is a rare complication of scarlet fever in the paediatric age group (4). Scarlet fever-related hepatitis cases were firstly reported by MacMahon and Mallory in 1931 (5). The pathophysiologic mechanism of the condition is unclear. Direct bacterial injury, toxicity and immunologic mediation had been proposed. Liver biopsies in patients with scarlet fever had shown the 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–major histocompatibility 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 the hepatocytes (8). Elevated liver transaminases had also been seen in invasive GAS infections which is indicative of hepatic involvement (9). It is possible that HLA polymorphism influences the susceptibility to the superantigens. It had been proved that the patients with severe and non-severe manifestations had a propensity to produce different levels of cytokine responses to the same superantigens, which might explain the interindividual diversity of the clinical manifestations observed in streptococcal infections (7). An animal study carried out *by* Goldmann *et al* showed that immunologic response to bacteria and clearance of bacteria were important mechanisms for organ damage in streptococci infections. The strong systemic immunologic response to GAS products and impaired capacity of bacterial clearance are more likely to cause organ damage. Animal with these characteristics showed large areas of hepatic ischaemia and sequestered intense inflammatory cells within the liver sinusoid and that meant increased ischaemia and extended hepatocellular damage (9). Jaundice was not common in scarlet fever hepatitis, and the prevalence is 0.06% in an autopsy series (10). Post-mortem cultures of the 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 (11).

CONCLUSION

The patient was diagnosed with scarlet fever based on his clinical and laboratory evaluations. Because his clinical and laboratory improvements were not prolonged and liver biopsy is an invasive method to evaluate transient hepatitis, it was not performed in this case. It was an unexpected finding to see hepatitis in this patient. We found it worthwhile to report this unusual presentation because it would be as a reminder for another reason of hepatitis in childhood except of well-known hepatotrophic virus.

REFERENCES

1. Quinn RW. Comprehensive review of morbidity and mortality trends for rheumatic fever, streptococcal disease and scarlet fever: the decline of rheumatic fever. Rev Infect Dis 1989; **11:** 928–53.
2. Kocak N, Ozsoylu S, Ertugrul M, Odzol G. Liver damage in scarlet fever. Clin Pediatr 1976; **15:** 462–4.
3. Kliegman RM, Behrman RE, Jenson HB, Bonita FS. Nelson textbook of pediatrics. 18th ed. Philadelphia: Elsevier; 2007.
4. Gutierrez Junquera C, Escudero Canto MC, Ruiz Cano R, Cuartero del Pozo I, Gil Pons E. Cholestatic hepatitis as initial manifestation of scarlet fever. An Pediatr 2003; **59:** 193–4 .
5. MacMahon HE, Mallory FB. Streptococcus hepatitis. Am J Pathol 1931; **7:** 299–325. Brody H, Smith LW. The visceral pathology in scarlet fever and the related Streptococcus infections. Am J Pathol 1936; **12:** 373–99.
6. Norby-Teglund A, Chatellier S, Low DE, McGeer A, Green K, Ktob M. Host variation in cytokine responses to superantigens determine the severity of invasive group A streptococcal infection. Eur J Immunol 2000; **30:** 324–55.

7. Fujita S, Arii S, Monden K, Adachi Y, Funaki N, Higashitsuji H et al. Participation of hepatic macrophages and plasma factors in endotoxin-induced liver injury. J Surg Res 1995; **59:** 263–70.
8. Demers B, Simor AE, Vellend H, Schlievert PM, Byrne S, Jamieson F et al. Severe invasive group A streptococcal infections in Ontario, Canada: 1987–1991. Clin Infect Dis 1993; **16:** 792–800.
9. Goldmann O, Chhatwal GS, Medina E. Immune mechanisms underlying host susceptibility to infection with Group A streptococci. J Infect Dis 2003; **187:** 854–61.
10. Brody H, Smith LW. The visceral pathology in scarlet fever and the related Streptococcus infections. Am J Pathol 1936; **12:** 373–99.
11. Stevens DL. Streptococcal toxic-shock syndrome: spectrum of disease, pathogenesis, and new concepts in treatment. Emerg Infect Dis 1995; **1:** 69–78.