Title: Severe Form of Scarlet Fever in a Child: A Case Report

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ABSTRACT

Background: Scarlet fever is a disease of acute onset, followed by pharyngitis, with high fever and skin rash, as well as the likelihood of developing severe allergic complications.

Case report: An 11-year-old boy was referred to the Children's Infectious Diseases Hospital complaining of a fever, rash and sore throat. The child had a high intoxication, as well as punctate exanthema against a hyperemic background, a hemorrhagic rash on the lower extremities, purulent plaques in the lacunae of the tonsils. Blood tests determined hyperleukocytosis, neutrophilia, and increased ESR. Abundant erythrocyte was detected in the urine analysis. Hypocoagulability is determined in coagulation tests. Following the background of antibiotic therapy, desensitization and detoxification, on the 11th day the child was discharged from the hospital with clinical and laboratory improvement.

Conclusion: Scarlet fever often occurs in a mild and moderate form. However, a severe and complicated course of the disease is possible as well.

Key words: streptococcal infection, scarlet fever, group «A» beta-hemolytic streptococcus.

INTRODUCTION

One of the most common bacterial infections in humans is «A» group of β-hemolytic streptococcus. Streptococcal infection forms in numerous clinical forms: from superficial, such as tonsillopharyngitis and erysipelas, to deep (necrotizing fasciitis, meningitis, pneumonia, peritonitis), toxin-mediated (scarlet fever) and immunopathological variants (acute rheumatic fever, post-streptococcal glomerulonephritis, etc.) [1]. Scarlet fever occupies a special place among them. Up to 80% of modern scarlet fever cases occur between the ages of 4 and 12 years.
Despite the predominance of non-severe and uncomplicated forms of scarlet fever, there are also severe forms with a risk of complications and deaths. [3,4,5].

Scarlet fever is ubiquitous, but is more common in temperate and cold regions. One of the characteristic features of the disease is periodic ups and downs in the incidence. In the East Kazakhstan region, as well as in the Republic of Kazakhstan, there is an increase in the incidence of scarlet fever. So, in 2019, in the Republic of Kazakhstan, the incidence (per 100 thousand of the population) was 4.10, in the East Kazakhstan region - 8.88, and in 2020: in the republic - 11.51, according to the East Kazakhstan region - 28.57 [2]. In the article we presented a case of a severe form with a hemorrhagic component of scarlet fever in an 11-year-old child, registered in the Children's Department of the Infectious Diseases Hospital in the city of Semey, East Kazakhstan region, Republic of Kazakhstan.

CASE REPORT

A boy, 11 years old, was hospitalized in the children's department of the infectious disease hospital with complaints of fever up to 40°C, sore throat, weakness, and rash on the body. The patient was admitted on the 2nd day from the onset of the disease. The child has been ill for two days, starting with an increase temperature to 38.5°C, in the dynamics of fever up to 40°C, weakness, vomiting was noted once. On the 2nd day of the disease, a miliary rash appeared on the body, sore throat. On the direction of the doctor of the polyclinic, he was sent for hospitalization in the infectious diseases hospital. Epidemiological history: 5 days before the onset of the disease, the boy was in contact with a schoolchild who was diagnosed with "purulent tonsillitis".

During hospitalization, the general condition of the patient was regarded as severe, due to manifestations of intoxication, profuse rash, hemorrhagic syndrome and purulent-inflammatory process in the oropharynx. Body temperature at admission 39.9°C. The state of health suffers, lethargic. Skin: against a hyperemic background, a small point rash is noted throughout the body (figures 1,2) with thickening in natural folds, and on the inside of the forearms and thighs - a miliary rash. Hemorrhagic petechial rash on the lower extremities. There was hyperemia of the cheeks, forehead, pale nasolabial triangle, white dermographism. When
examining the oropharynx: hyperemia of the mucous membranes, hypertrophied tonsils, purulent deposits in the lacunae on both sides. The tongue is cleared of plaque, papillae are expressed –«raspberries tongue» (figure 3). Submandibular lymph nodes are enlarged, painless, mobile. Vesicular breathing is auscultated in the lungs, no wheezing, respiratory rate - 24 per minute. Heart sounds are muffled, rhythmic, tachycardia, heart rate - 160 per minute. Arterial pressure: 125/85. The abdomen is soft and painless. Urination is reduced. Laboratory examination (table 1) revealed leukocytosis, neutrophilia, accelerated ESR, a decrease in platelet count in the general blood test, a moderate decrease in fibrinogen and a prolongation of APTT in the coagulogram. Urinalysis revealed transient erythrocyturia without impairment of the concentration function of the kidneys. Bacteriological examination of a throat swab revealed a culture of Streptococcus pyogenes.

Acute onset of the disease, fever up to 40°C, pronounced intoxication syndrome, small punctate rash on a hyperemic background, and hemorrhagic elements on the lower extremities, purulent tonsillitis phenomena confirmed the clinical diagnosis of scarlet fever, typical form, severe severity.

Since admission, antibacterial therapy with benzylpenicillin was started for 1 million units four times a day intramuscularly for 8 days. On the day of admission, a single intravenous infusion was performed for detoxification. During hospitalization desensitizing drugs were prescribed.

Against the background of the treatment, on the third day of hospitalization, the body temperature decreased to subfebrile, and from the 4th day it returned to normal. From the 5th day of hospitalization, the boy's rash began to gradually fade; by the end of the week of hospitalization, small bran-like peeling on the body and large-lamellar on the palms appeared. Purulent plaque on the tonsils persisted until the 7th day of hospitalization. Cardiac activity, blood and urine tests returned to normal by the 9th day of hospitalization. The patient was discharged on the 11th day of hospitalization.

**DISCUSSION**

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Scarlet fever refers to streptococcal infectious diseases and can occur from atypical to severe forms. Scarlet fever still remains a serious epidemiological and clinical problem. Until now, the importance of scarlet fever in the development of toxico-allergic complications, such as myocarditis and glomerulonephritis, has been great. So, according to various studies, up to 10-12% of the development of diffuse glomerulonephritis is associated with scarlet fever.

The reservoir and source of infection is a patient with tonsillitis, scarlet fever and other clinical forms of streptococcal infection, as well as healthy carriers of group A streptococci. In our case, the boy was in contact with a patient with tonsillitis at school.

More often scarlet fever in children younger than 10 years occurs in a mild or moderate form, up to 1-2% is in severe forms. In the presented clinical case, the boy had symptoms of a typical scarlet fever with a severe course: hyperthermia up to 40°C, pronounced symptoms of intoxication (vomiting, weakness, lethargy), a typical small-pointed rash on a hyperemic background, hemorrhagic elements were also noted, which also characteristic of severe severity. The child had typical changes in the oropharynx – bright limited hyperemia of the tonsils, purulent raids, and an increase in peripheral submandibular lymph nodes. It should be noted that in the first week of the disease, the boy had changes in the heart, which is associated with a change in the tone of the autonomic nervous system (sympathetic phase): tachycardia, a slight increase in blood pressure. In the blood test, the child had inflammatory changes. Urine tests returned to normal in parallel with the relief of intoxication syndrome. There was a hemorrhagic syndrome (petechial rash) with laboratory confirmation (in the coagulogram of the phenomenon of hypocoagulation), which is also a criterion for the severe course of scarlet fever.

Due to timely hospitalization and adequate therapy, this patient did not develop any complications by the time of discharge (11th day of illness). However, doctors must remember that complications associated with the allergic component of group A streptococcus (glomerulonephritis, myocarditis) may develop in the later stages after recovery. In order to timely monitor the possible development of complications after scarlet fever, following discharge from the infectious diseases hospital, the patient's discharge summary included recommendations for the further management of the child at the outpatient level. The

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recommendations included monitoring of a complete blood and urine test, conducting an electrocardiogram, consultation with a nephrologist, cardiologist).

CONCLUSIONS

The clinical picture of scarlet fever varies from mild to severe, as described in this case. Doctors should be aware of the clinical manifestations of the disease, the risk of complications and further management of the patient after recovery.

REFERENCES


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LEGENDS OF FIGURES and TABLE

**Figure 1.** Small point rash on the lower extremity.

**Figure 2.** A diffuse small and punctiform rash on the abdomen skin.

**Figure 3.** The «strawberry» tongue in scarlet fever and perioral desquamation.

**Table 1.** The laboratory test results.
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Table 1. The laboratory test results.

<table>
<thead>
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<th>Laboratory test</th>
<th>Hospital days</th>
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<tr>
<td>WBC (x10⁹/l)</td>
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<tr>
<td>RBC (x10¹²/l)</td>
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<tr>
<td>Hemoglobin (g/l)</td>
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<tr>
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<tr>
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<td>Creatinine (mkmol/l)</td>
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</tbody>
</table>

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