

SEPSIS WITH STAPHYLOCOCCUS AUREUS IN AN INFANT WITH SEVERE GASTROENTERITIS CASE REPORT

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Summary

Young age, malnutrition,, leak of breast-feeding, exposure to unsanitary conditions are factors that increase susceptibility to severe bacterial infections. We present the case of a two month old male infant hospitalized in our clinic for severe gastroenteritis with dehydration and sepsis with Staphylococcus aureus.

Key words: sepsis, infant, Staphylococcus aureus, gastroenteritis

Introduction

Infants smaller than 3 months are at increased risk to serious bacterial infections.(1) Sepsis is a chain of events that begins with a minor infection. There is an increase in sepsis caused by organisms that are resistant to most standard antibiotics. The incidence of sepsis has nearly doubled in the last decade.

Staphylococcal sepsis may be associated with any localized infection. The onset may be acute and marked by vomiting and fever.(1) As the infection worsens staphylococcal bacteria enter the blood stream. The body attempts to defend itself against the infection with a series of inflammatory and antiinflammatory compounds that attack body tissues.

The cell wall peptidoglycan elicits endogenous pyrogen production from monocytes, is chemotactic, activates complement, has endotoxin-like properties. (1, 2) Adhesion of S.taphylococcus aureus to mucosal cells is mediated by teichoic acid in the cell wall (3)

Untreated staphylococcal sepsis is associated with a mortality rate of 80% or greater. Mortality rates have been reduced to 20% by appropriate antibiotic treatment. (4, 5)

Prognosis may be influenced by numerous host facts, including nutrition, immunologic competence and the presence or absence of other debilitating diseases.(1, 6, 7)

Case report

We present a two months old male infant, admitted in the 1st Pediatric Clinic in „Louis Țurcanu” Children’s Hospital Timișoara on 04.10.2002. He is the second child of an young healthy couple from the country. The pregnancy was not followed up and the child was born in term, with a weight of 3100g and Apgar score 9. He was fed with breast milk for 21 days and then with powder milk. The socio-economic status of the family was low. The weight growth was inadequate.

The history of illness

For 72 hours the infant presented severe watery diarrhoea, vomiting and high fever 39°C. The treatment at home with Smecta, antipiretics and diet didn’t stop the symptoms, so the patient was admitted in our hospital.

Clinical findings

The infant was lethargic, with generalized hypotonia, hypothermia (core temperature=36°C and cutaneous temperature=35,6°C). He’s weight was 3300 g. The skin was very pale, mottled, with prolonged capillary refill time over 3 sec, cold extremities and persistent abdominal cutaneous fold. (Fig.1) The anterior fontanel was depressed and mucous membranes were dry. Eyes were sunken. There were present tachypnea 60 breaths/min and tachycardia 150/min. The peripheral pulse was weak. The blood pressure was 46/25 mmHg. There was abdominal distention and the stools were watery. Oliguria was present. There was no stiffness of the neck.



Fig.1 Clinical aspect.

Laboratory findings

Table 1. Blood cell count

Data/variabila	04.10.2002	11.10.2002
Hemoglobin g%	6,5,	8,3
Erythrocyte/mm ³	2410000	3200000
Hematocrit %	24	28
Leucocyte/mm ³	29100	9300
Immature forms %	13	0
Granulocytes %	77	68
Lymphocytes %	10	32

Table 2. Tests for coagulation

Data/variabila	04.10.02	11.10.02
Platelet count/mm ³	31000	107000
Bleeding time	6'30"	3'15"
Coagulation time	8'30"	5'
Prothrombin time	55"	15"
Fibrinogen level g/l	1,2	2,2

Table 3. Arterial blood gases

Date/hour/variable	04.10.02 18.45	04.10.02 22.51	07.10.02
PH	6,95	7,17	7,38
BE mmol/l	- 29,4	- 23	- 2,3
PCO2 mmHg	28	31	39

Table 4. Serum glucose level

Date/hour/variable	04.10.02 18.45	04.10.02 20.30	05.10.02
Glucose mg%	203	118	104

Table 5. Serum electrolytes level

Date/variable	04.10.02	07.10.02
Na mmol/l	125	139
K mmol/l	2,9	4
Ca mmol/l	2,4	2,55
Cl mmol/l	90	103

- Acute – phase reactants: CRP pozitive; ESR: 20 mm/1h
 - Serum iron: 5,4 micromoli/l

Table 6. Renal function

Date/variable	04.10.02	08.10.02
Serum urea level mmol/l	13,30	5,3
Serum creatinine µmol/l	139	35

Table 7. Cultures

Specimen	Result
Blood	Staphylococcus aureus
Throat swab	Staphylococcus aureus
Nasal swab	Staphylococcus aureus
Stool	Negative
Urine	Sterile

Treatment

Antimicrobial agents: Ceftriaxone 0,3 g/day and Pierami 0.045 g/day iv ; Colimicină 100000ui/kg/day po 3 days.

Intravenous fluid resuscitation:

Isotonic sodium chloride solution intravenously in numerous boluses of 20 ml/kg; glucose 10% and electrolytes (Na Cl 5,8%; KCl 7,4%)

- Correction of metabolic acidosis with sodium bicarbonate

Oxygen 8l/min via face mask and monitor saturation with a pulse oximeter.

Sympathomimetic agent: Dopamine 0,5% 3 µg/kg/min for 10 hours.

- Transfusion with packed red cells
 Smecta by mouth
 Antipiretic medication (algalmin iv)
 Parenteral administration of vitamins B₁, B₆
 Parenteral nutrition with Aminovenos and

Intralipid

Vital signs and patient's perfusion were carefully monitored.

Diet:

- Oral glucose electrolyte solution (Gesol)
- Low-lactose formula

Evolution

With treatment the vomiting and diarrhoea stopped, the severe dehydration reversed , the digestive tolerance restored. The weight increase was of 1500 g.

The infant was discharged after 8 days with following recommendations:

- following up by family doctor for iron deficiency anemia and mild protein-caloric malnutrition
- feeding with powder milk
- treatment with iron in oral solution Ferrum Hausmann 3x10 drops/day and Pikovit syrup 2,5 ml/day 1-3 months
- active immunizations according to schedule
- administration of Vigantol and calcium by mouth

Discussions

Infants are more susceptible to dehydration because of the greater basal fluid and electrolyte requirements per kilogram (1) Early aggressive volume resuscitation has been shown to improve survival.

Disseminated disease with Staphylococcus aureus may occur after a viral infection that suppresses neutrophil or respiratory epithelial cell function. (1, 2, 7) Sepsis is revealed by clinical findings (hyperthermia, tachycardia, cold extremities with prolonged capillary refill, oliguria) and laboratory manifestations (positive blood culture; metabolic acidosis; anemia; leucokytosis and increase in juvenile forms). (6, 7, 8) Antibiotics remain one of the few therapies that improve the outcome in sepsis (8, 9)

Conclusions

1. Small infants are particularly vulnerable at severe infections.
2. Malnutrition, anemia, leak of breast-feeding, are factors that increase susceptibility to severe diarrhoea.

3. Management of dehydration remains the corner-stone of therapy of severe gastroenteritis
4. Optimal management of severe sepsis depends of rapid recognition, aggressive restoration of circulating

volume with fluid boluses, initiation of appropriate antibiotic therapy, and implementation of adequate monitoring.

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