Intracranial Hemorrhage in Newborns with Intrauterine Infections

Botagoz Zhekeyeva, Balash Tussupkaliyev, and Akmaral Zhumalina

Abstract—40 patients, newborn infants, with intrauterine infections were studied. Analyzing blood serum using the methods of immune-enzyme analysis and polymerase-chain reaction confirmed in 100% of cases presence of intrauterine infection—cytomegalovirus (57.5%), toxoplasmosis (5%), chlamydia (32.5%), herpes simplex virus (5%). 87.5% of infants had computed tomography and 85.7% of the cases had various confirmed intracranial hemorrhages.

Keywords—Intrauterine Infection, newborn, cytomegalovirus, toxoplasmosis.

I. INTRODUCTION

Intracranial hemorrhages are of great interest in medical practice. Homonymous condition results in severe complications, however the disease and its consequences may be prevented using timely prevention and treatment. This statement is based on the fact that in the past years (especially the past 2 years) intracranial hemorrhages occur frequently [1], although there is no scientific statistics in our country.

12, 0% had high extent [5]. It should be underlined that according to Multiple Indicator Cluster Survey conducted by Kazakh Academy of Nutrition with the support of UNICEF in 2006, iodine deficiency prevalence among women of reproductive age decreased quadruple neonatologists in various hospitals, all that bringing about difference in tactics of labor management, in particular, in the frequency of cesarean operations, perineotomy, medication treatment for the mother and the newborn infant, ambiguity of interpretation of the same clinical situation, laboratory and other paraclinical data (for instance, ultrasound findings).

In view of all that, we set ourselves the task: to study the frequency and the clinico-laboratory presentations of intracranial hemorrhages with newborn infants.

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II. MATERIALS AND METHODS

We reviewed case reports of newborn infants in hospital treatment at the children’s hospital of City of Aktobe for the period 2010 to 2012. Over that period, 40 patients were in treatment in their newborn period with various intracranial hemorrhages.

Clinical tests were performed, such as common blood test, common urine test, and biochemical tests: blood bilirubin, AST, ALT, blood protein, CRP; immune-enzyme analysis, polymerase-chain reaction; neurosonography, USS of liver and kidneys; computed tomography of the brain.

III. RESULTS AND DISCUSSION

Among the infants under monitoring, 40% of were from completed pregnancy, at a gestational age of 35-36 weeks - 25%, 33-34 weeks - 15%, 31-32 weeks - 12.5% and less than 28 weeks - 7.5%.

5% of the infants that came in had been born with a body weight less than 1 kg; with a weight less than 1.5 kg – 2 (5%), less than 2 kg – 3 (7.5%), less than 2.5 kg – 9 (22.5%), less than 4 kg – 22 (55%), more than 4 kg – 2 (5%). At the time of birth, neurologic symptoms in form of spasmodic syndrome were found with 40% of of infants, 37.5% had asphyxia of a newborn, 12.5% of the infants suffered various changes in the cardiovasucular system.

During the first 3 days of life, the clinic received 6 patients (15%), less than 1 week – 14 infants (35%), less than 2 weeks – 10 infants (25%), less than 3 weeks – 3 infants (7.5%), less than 4 weeks – 7 infants (17.5%). In 50% of the cases, intracranial infection was diagnosed, in 22.5% - cerebral ischemia, in 7.5% – pneumonia of a newborn, same number – HAT and morphofunctional immaturity, in 5% – neonatal jaundice, in 2.5% - birth trauma.

Symptoms of disease with all the 40 patients developed acutely, from several hours to several days. All the infants at the beginning had impaired stool and abdominal distension. Increased bleeding tendencies showed as bruises on the skin (80%), petechiae on the hard palate (37.5%), hemorrhages from injection spots (37.5%). Jaundice colouring of the skin of the mucous membrane was noticed with 75% of the patients. 87.5% of the infants had paleness of the skin and of the mucous membranes. Enlarged livers were with 80%, enlarged spleen with 75% of the patients.

10 (25%) infants were delivered in a state of coma, 50% of the infants had convulsions, almost all the 40 patients had a flaring of the prefontanel, anxiety, regurgitation, and vomit.
25% of the patients had decreased numbers of thrombocytes to less than 150,000. Slight anaemia (decrease of haemoglobin, lower than 80 g/l) was found with 70% of the infants (28 infants), haemoglobin level 100-80 g/l with 8 infants, haemoglobin lower than 80 g/l with 4 infants (10%), decrease of haemoglobin less than 80 g/l — 7.5%, lower than 100 g/l — 12.5%, lower than 120 g/l — 7.5%. 60% of the infants showed longer coagulation periods according to Sukharev.

**CT presentation** is characteristic of intracerebral hematoma on the parietal lobe of the left hemisphere. Signs of subarachnoid hemorrhages on the left. Signs of edema of the left hemisphere of the brain.

Level of bilirubin was increased in 37.5% of the cases, including less than 200 mmole/l with 5 (12.5%), less than 300 mmole/l with 6 (15%), and more than 300 mmole/l with 4 (10%). All the patients at the time of coming in had some degree of increase in direct bilirubin more than 10% of whole bilirubin. In 50% of cases there was an increased level of ALT and AST. Analyzing of blood serum using the method of immune-enzyme analysis and polymerase-chain reaction confirmed in 100% of cases the presence of intrauterine infection — cytomegalovirus (57.5%), toxoplasmosis (5%), clamidia (32.5%), herpes simplex virus (5%). Patients were examined by a neurosurgeon, a neurologist, an ophthalmologist and a pediatrician. All the infants with assumed intracranial hemorrhage received neuросonography. Results in 30% of of cases showed dislocation syndrome. 50% of of cases were characterized by a presentation of intraventricular hemorrhage and 20% of cases showed a combination of subarachnoid hemorrhages with parenchymatous hemorrhage. For 87.5% of the infants computed tomography was performed and 85.7% of the cases had various intracranial hemorrhages confirmed. Only in 5 (12.5%) cases, patients were moved to the regional children’s hospital on neurosurgical beds.

Medication therapy in the acute period was aimed at the restoration of hemostasis, correction of the anaemia, maintaining of the brain perfusion and arresting of the brain edema. With lengthier coagulation periods, fresh frozen plasma was introduced and packed red cell transfusion performed according to indications. 15 infants (37.5%) that showed positive results of immune-enzyme analysis for cytomegalovirus IgM and IgG more than 10 times received treatment with gamma-globulin — Neotsitotek, as per instructions. Out of the 40 cases, a lethal outcome occurred in 3 cases (7.5%). In none of the cases did divergence of clinical and pathologic diagnosis arise. Two were diagnosed with cytomegalovirus viral infection and one with toxoplasmosis. In all the three cases, pathologic study showed congenital immunodeficiency disorder: hypoplasia of the thymus glans with atrophy of the lymphoid tissue, which we specially emphasize.

Therefore, our preliminary data show causes of intracranial hemorrhage to be intrauterine infection occurring during the post-natal period (67.5%), late presentation of hemorrhagic illness (25%), while the remaining 7.5% had their causes unestablished.

**IV. Conclusion**

1. In case of symptoms of acute intracranial hypertension with infants 0 to 1-2 months (sometimes even to the end of the first half of the first year of life) with a compromised perinatal history, when taken to hospital, it is necessary that intracranial hemorrhage should be excluded in the first place.

2. All infants with signs of intracranial hemorrhage must be carefully studied for intrauterine infection.

3. It is necessary to add to the screening protocol for pregnant women a test for intrauterine opportunistic infections (at least for those in the high risk group)

4. Differentiated neurosurgical tactics need to be developed for the management of newborns with intracranial hemorrhages (when and how to act?).

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