SOMATIC OPTIMIZATION FOR INFANTS WITH PERINATAL CENTRAL NERVOUS SYSTEM INJURY IN THE FIRST YEAR OF LIFE

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Relevance of the Problem: The issue of perinatal post-hypoxic brain injury is extremely relevant, as it is associated with the increasing incidence of brain diseases in newborns and plays a leading role in the development of childhood disabilities. Significant challenges remain in diagnosing and treating this condition, even in the absence of gross neurological pathology, affecting the subsequent neuropsychological and somatic development of children. It is known that the neurological condition of newborns with perinatal post-hypoxic brain injury largely depends on the brain's maturity, the severity of the injury, and associated diseases. However, clinical signs do not always reflect the true severity and extent of central nervous system damage, which may be influenced by the high neuroplastic potential of an infant's brain in the first year of life. The disease outcome, including adverse results, becomes apparent only at 9-12 months of age. Currently, therapeutic measures for infants with perinatal post-hypoxic central nervous system injury are sometimes insufficiently effective, highlighting the importance of developing optimal methods to influence the restoration of damaged brain tissues. It is crucial to minimize the source of damage and preserve as many functioning nerve cells as possible, especially for infants expected to exhibit continued neurological symptoms by the end of the first year of life.

Study Objective:

The objective is to develop prognostic criteria for the outcomes of perinatal central nervous system injury in infants by the end of the first year of life and optimize treatment tactics. To achieve this objective, the following tasks were addressed:

1. Study the dynamics of the neurological status in the first year of life in infants with moderate perinatal post-hypoxic central nervous system injury.

2. Examine the state of lipid peroxidation, antioxidant defense processes, and the functional status of cell membranes and neuro-specific components in infants with perinatal central nervous system injury in the first year of life.

3. Develop prognostic criteria for the outcomes of perinatal central nervous system injury in a cohort of infants observed by the end of the first year of life.

4. Evaluate the effectiveness of using Cortexin in the therapeutic measures for infants expected to have continued clinical manifestations of perinatal central nervous system injury by the end of the first year.

Scientific Novelty:

This study is the first to:

- Conduct a comprehensive, prospective clinical and biochemical investigation (from birth and throughout the first year of life) of infants with moderate perinatal post-hypoxic central nervous system injury, considering the disease outcomes. This includes studying lipid peroxidation processes, antioxidant defense, and the functional status of cell membranes, including brain neurons.

- Identify statistically significant deviations in the studied biochemical indicators from the control group, which persist throughout the observation period for all infants regardless of disease outcomes by the end of the first year.

- Determine that the presence of statistically significant deviations in the studied biochemical indicators correlates with the disappearance or persistence of neurological symptoms by the end of the first year during primary therapy.

- Develop informative prognostic criteria for the outcomes of perinatal central nervous system injury by the end of the first year through primary therapeutic measures.

- Create a prognostic formula using discriminant analysis to assess the outcomes of perinatal central nervous system injury by the end of the first year during primary therapy.

- Assess the effectiveness of using the peptide bioregulator Cortexin in the therapeutic measures for infants expected to have continued clinical manifestations of perinatal central nervous system injury by the end of the first year.

Practical Significance:

The developed prognostic criteria for the outcomes of moderate perinatal central nervous system injury by the end of the first year, and the inclusion of the peptide bioregulator Cortexin in the therapy regimen based on these criteria, help reduce the incidence of the disease. This approach aids in managing neurological symptoms in infants with predicted persistent clinical manifestations over the course of the year.

Conclusions:

1. In infants with moderate perinatal post-hypoxic central nervous system injury who received primary therapy, 53% retained neurological symptoms by the end of the first year. The predominant syndromes included hypertonic syndrome (96.3%), increased neuro-reflex excitability syndrome (24.5%), pyramidal insufficiency syndrome (16.9%), and vegetative-visceral disorders syndrome (9.4%).

2. Regardless of disease outcomes, lipid peroxidation-antioxidant defense system disruptions persist throughout the first year, evidenced by increased levels of

dien conjugates and malondialdehyde in serum, and reduced intensity of chemiluminescence and alpha-tocopherol, leading to instability of cell membranes in brain neurons.

3. The most significant changes in the studied biochemical indicators were observed in the group of infants with persistent neurological symptoms by the end of the first year.

4. An informative criterion for the persistence of neurological symptoms in infants with moderate perinatal central nervous system injury by the end of the first year is the increased peroxide resistance of erythrocytes in serum (3.2).

5. The effectiveness of using Cortexin in the therapeutic measures for infants expected to have continued clinical manifestations of perinatal central nervous system injury by the end of the year was evaluated.

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