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EXTERNAL RESPIRATORY STATES WITH NUTRITIONAL BOTULISM IN CHILDREN

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Abstract
The severity of this disease ultimately depends mainly on the depth of respiratory disorders, objective criteria for the severity of the process may be changes in the indicators of external respiration. ODN with botulism in children develops naturally and in a compensated form occurs already with a MRVerate course of the disease. The GEL index is an objective criterion of the severity of botulism, which differs with a high degree of reliability in patients with children with mild, MRVerate-severe, severe course of the main process.

Keywords: Food botulism in children, severity criteria.

СОСТОЯНИЯ ВНЕШНЕГО ДЫХАНИЯ ПРИ ПИЩЕВОМ БОТУЛИЗМЕ У ДЕТЕЙ

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Степень тяжести этого заболевания в конечном итоге зависит в основном от глубины дыхательных нарушений, объективными критериями тяжести процесса могут явиться изменения показателей внешнего дыхания. ОДН (острой дыхательной недостаточность) при ботулизме у детей развивается закономерно и в компенсированной форме имеет место уже при средне-тяжелом течении заболевания. Показатель ЖЕЛ (жизненный емкость легких) является объективным критерием тяжести ботулизма, с высокой степенью достоверности различающийся у больных у детей с легким, среднетяжелым, тяжелым течением основного процесса.

Ключевые слова: Пищевой ботулизм у детей, критерия тяжести.

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Introduction

The mortality rate in food botulism today is from 8 to 25% [1,6,8], which makes the problem very relevant. Unfortunately, today there are no radical methods of treating this serious disease all over the world, so the success of therapeutic measures depends entirely on the rapid diagnosis of foodborne botulism and on the timely and competent use of the entire range of treatment methods available to TVctors (Specific antitoxic therapy, artificial ventilation lungs, etc.) [2,3,5,7]. On the other hand, the choice of one or another therapeutic measure is closely related to the coPMect assessment of the severity of the patient's condition and the early detection of acute respiratory failure (ARF) in food botulism, since what kind of ARF is the main cause of death of patients [4.6]. It should be noted here that ARF is often refePMed to as a complication of foodborne botulism [1], although it is a natural stage in the development of botulinum intoxication. [5].CuPMently, the severity of the condition of children with foodborne botulism is assessed only by clinical signs. [3,7]. In this regard, the severity criteria are largely subjective, and in addition, there may be a discrepancy between the true severity of the condition of children and the severity of some of the most important clinical signs of food botulism. All this often leads to an underestimation of the severity of the disease and a late start of resuscitation in children with severe food botulism [3], while an overestimation of the severity of the disease and the depth of respiratory disorders can lead to the transfer of sick children to artificial respiration without data on the fact that is undesirable and sometimes unacceptable. Therefore, it becomes obvious that today there are no reliable objective criteria for the severity of foodborne botulism in children. Given that the severity of this disease ultimately depends mainly on the depth of respiratory disorders, objective criteria for the severity of the process may be changes in the state of external respiration.

Objective of the Study

the state of external respiration in children with different degrees of severity of the course of food botulism.

Materials for Research

We examined 36 sick children with foodborne botulism aged 6 to 14 years, who were diagnosed on the basis of clinical, epidemiological and laboratory data. The indicators of external respiration were determined in patients with different severity of botulism in children in the dynamics of the main process: respiratory rate per minute (PM),

minute respiratory volume (MRV), tidal volume (TV), lung capacity (LC). The control group consisted of almost 10 healthy children. The study of external respiration parameters (MRV, TV, LC) was caPMied out using the "Spirometer MAS-1", 2018.

Research Methods: anamnestic, clinical and laboratory.

Results

According to the severity of the main process, the patients were distributed as follows: there were 8 (22%) patients with severe forms, 16 (45%) with MRVerate forms, and 12 (33%) with mild forms. In the observed patients, there were no indications in the anamnesis of the presence of any serious pathology on the part of the respiratory or circulatory organs, which could significantly affect the parameters of external respiration. Among the observed patients, there were 28 (78%) group diseases and 8 (22%) sporadic cases. All cases of illness were caused by home canned food. The duration of the incubation period could be established in all patients, which averaged 22.42±1.7 hours, and depending on the severity of the course of the disease - 26.90±4.0; 22.61±2.06; 16.28±3.06 hours, respectively, for mild, MRVerate-severe and severe foodborne botulism in children.

Of the 36 examined children with botulism, 12 (33%) had a mild course of the disease. Upon admission to the hospital of this group of children, the indicators of external respiration averaged: PM = 21.87 ± 0.30 per minute; TV = 2.79 ± 0.03 cm3/kg of body weight; MRV = 74.19 ± 0.35 l; VC = 34.28 ± 0.58 cm3 / kg of body weight. (with fluctuations from 30 to 40 cm3 / kg). In all cases of a mild form of food botulism in children, the course was favorable; no further progression of the underlying process was observed.

The average stay of a patient with mild botulism in a hospital bed was 9.36±0.81 days. At discharge from the hospital, the indicators of external respiration in this group of patients were: PM = 21.05 ± 0.68 per minute; TV = 3.31±0.27 cm3/kg of body weight; MRV \u003d 74.27 ± 2.74 l; VC = 40.66±1.57 cm3/kg of body weight (with fluctuations from 35 to 45 cm3/kg). The analysis of the obtained results showed that in patients with a mild course of food botulism at the height of the disease, the indicators of external respiration almost did not differ from the codoesponding indicators in the control group (P ≥ 0.05), therefore, in children with a mild course of botulism, there were practically no disturbances in external respiration.

When admitted to the hospital, the indicators of external respiration in 16 (45%) children with moderate-to-severe botulism were on average equal: PM = 21.07 ± 0.04 per minute; TV = 2.21 ± 0.06 cm3/kg of body weight; MRV = 68.11 ± 0.46 l; VC = 19.58 ± 0.49 cm3 / kg of body weight. (with fluctuations from 15 to 25 cm3 / kg). Analysis of the obtained results showed that in children with moderate to severe course of botulism, at the height of the main process, there was a slight increase in breathing up to 20.11±0.06 per minute.

The MRV and TV indicators almost did not differ from the codoesponding values in the control group and children with mild botulism (P≥0.05). At the same time, despite the fact that most of the children in this group had no complaints of respiratory discomfort, there was a decrease in VC to 19.43±0.58 cm3/kg of body weight, which allows diagnosing ARF in a compensated form, and in all patients with moderate to severe foodborne botulism in children. In all cases of moderate-to-severe botulism in children, the outcome was favorable and no further progression of ARF was noted in patients.

At discharge from the hospital, the parameters of external respiration in this group of patients were equal: PM = 19.73±0.15 per minute; TV = 3.68±0.19 cm3/kg of body weight; MRV = 77.97±2.51 l; VC = 42.24±0.86 cm3/kg of body weight (with fluctuations from 32 to 43 cm3/kg). It should be noted here that 8 out of 13 children (61%) at discharge noted the restoration of VC to the proper values for them. The general condition of 8 (22%) patients upon admission was regarded as severe and transfePMed to the intensive care unit. Indicators of external respiration averaged: PM = 25.31 ± 0.48 per minute; TV = 1.69 ±0.05 cm3/kg of body weight; MRV = 52.19 ± 0.42 l; VC = 11.72 ± 0.48 cm3/kg of body weight (with fluctuations from 10 to 15 cm3/kg). All patients in this group complained of a feeling of inferiority of inspiration, a feeling of a coma behind the sternum, and severe general weakness. In 5 patients (63%) of 8 children, no deterioration in the dynamics was observed. The general condition of 3 patients (37%) continued to worsen, was disturbed by frequent choking of saliva, accompanied by a feeling of lack of air from the moment of admission and on average after 21.11 ± 3.84 hours, it was possible to stop ARF with the help of a complex of therapeutic measures (the use of a specific antitoxic, detoxification therapy, humidified oxygen inhalation).

Indicators of external respiration in 3 children at the time of maximum severity of neurological symptoms were on average equal: PM = 27.17±0.29 per min, MRV = 52 ±0.56 〖cm〗^3/kg of body weight, TV = 42, 6 ±0.02 〖cm〗^3/kg, VC = 10.72±0.23 cm3/kg body weight (with fluctuation from 10 to 15 cm3/kg) and were transfePMed

to the intensive care unit with suspected ARF decompensation. It should be noted here that on the background of intensive care, the children did not need to be transfePMed to a ventilator.

The clinical picture of severe forms of botulism in children, compared with moderate forms, was characterized by significantly more frequent events, such as swallowing disorders (liquid food) (5% and 80.%, respectively, $p<0.05$), paresis and paralysis of the soft palate (55% and 95%, respectively, $p<0.05$), complete and partial ptosis (50% and 95.%, respectively, $p<0.05$), and there were symptoms characteristic only for a severe form of the disease, such as acute respiratory failure of a compensatory nature. In patients with a severe form of the disease, the clinical picture was not only more pronounced, but also longer than in patients with a MRVerate form. In all cases, the disease had a favorable course. An average of 16.42 ± 0.54 days of hospital stay was sufficient for a complete recovery of the patients.

Conclusion

1. Acute respiratory failure in botulism in children develops naturally and in a compensated form occurs already in the moderate to severe course of the disease;

2. The indicator of lung capacity is an objective criterion for the severity of botulism, which differs with a high degree of reliability in patients in children with mild, moderate, severe course of the main process. So, with a mild course of food botulism in children, the vital capacity indicator is equal to or exceeds 35-45 〖cm〗^3/kg of body weight, with a moderate course it corresponds to 20-25 〖cm〗^3/kg of body weight, with severe course - the indicator of vital capacity of the lungs decreases to 12-17 〖cm〗^3/kg and below.

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