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EARLY DIAGNOSTICS OF PILOROSTENOSIS IN NEWBORNS

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Abstract

Congenital hypertrophic pyloric stenosis is one of the severe congenital disorders of the gastrointestinal tract in newborns, caused by hypertrophy of the muscular layer of the pyloric region and impaired gastric emptying into the duodenum. The incidence of the disease ranges from 0.5 to 3 cases per 1000 children, with a male predominance at a ratio of 4:1. Late diagnosis of pyloric stenosis leads to severe hypotrophy, disturbances of water-electrolyte balance, and metabolic alkalosis. **Aim of the study:** To optimize the diagnosis of congenital pyloric stenosis based on clinical, radiological, and instrumental methods of investigation. **Materials and methods:** From 2017 to 2025, 125 patients with congenital pyloric stenosis were comprehensively examined at the Andijan Regional Multidisciplinary Children's Medical Center. Diagnostic methods included clinical assessment, contrast radiography, ultrasonography, endoscopy, and laboratory investigations. **Results and conclusion:** According to the results, 103 patients (82.4%) were hospitalized at the age of 1–3 months, while 22 patients (17.6%) were admitted during the neonatal period. The main clinical manifestations included projectile vomiting, progressive weight loss, decreased diuresis, and intensified gastric peristalsis. Contrast radiography and ultrasonography demonstrated high diagnostic value in detecting congenital pyloric stenosis. Early diagnosis and a comprehensive treatment approach contribute to the prevention of severe metabolic disorders and significantly improve clinical outcomes in children with congenital pyloric stenosis.

Keywords

congenital pyloric stenosis, hypertrophic pyloric stenosis, newborns, diagnosis, contrast radiography, ultrasonography.

CHAQALOQLARDA PILOROSTENOZ KASALLIGINI ERTA TASHXISLASH

Annotatsiya

Tug‘ma gipertrofik pilorostenoz chaqaloqlarda oshqozon-ichak tizimining og‘ir tug‘ma patologiyalaridan biri bo‘lib, pilorik qism mushak qatlamining gipertrofiyasi natijasida rivojlanadi va oshqozon bo‘shlig‘idan o‘n ikki barmoqli ichakka ovqat o‘tishining buzilishi bilan tavsiflanadi. Kasallikning uchrash chastotasi 1000 nafar bolaga 0,5-3 holatni tashkil etib, o‘g‘il bolalarda qizlarga nisbatan 4:1 nisbatda ustunlik qiladi. Tug‘ma pilorostenozning kech tashxislanishi bolalarda og‘ir gipotrofiya, suv-elektrolit muvozanatining buzilishi va metabolik alkaloz rivojlanishiga olib keladi. **Tadqiqot maqsadi:** Tug‘ma pilorostenozni klinik, rentgenologik va instrumental tekshiruvlar asosida erta aniqlash va diagnostikani optimallashtirish. **Tadqiqot materiali va usullari:** 2017–2025-yillarda Andijon viloyat bolalar ko‘p tarmoqli tibbiyot markazida tug‘ma pilorostenoz bilan og‘rigan 125 nafar bemor kompleks tekshirildi. Diagnostikada klinik kuzatuv, rentgenokontrast tekshiruvlar, ultratovush tekshiruvi, endoskopiya hamda laborator tahlillar qo‘llanildi. **Natijalar va xulosa:** Tadqiqot natijalariga ko‘ra, bemorlarning 103 nafari (82,4%) 1–3 oylik yoshda, 22 nafari (17,6%) esa yangi tug‘ilgan davrda kasalxonaga yotqizilgan. Asosiy klinik belgilar “favvora” tarzidagi qusish, tana vaznining

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progressiv kamayishi, diurezning pasayishi va oshqozon peristaltikasining kuchayishi bilan namoyon bo‘ldi. Rentgenokontrast va ultratovush tekshiruvlari tug‘ma pilorostenoz diagnostikasida yuqori informativlikka ega ekanligi aniqlandi. Tug‘ma pilorostenozni erta tashxislash va kompleks yondashuv asosida davolash bolalarda og‘ir metabolik buzilishlar rivojlanishining oldini olish hamda davolash natijalarini yaxshilash imkonini beradi.

Kalit so‘zlar

tug‘ma pilorostenoz, gipertrofik pilorostenoz, chaqaloqlar, diagnostika, rentgenokontrast tekshiruv, ultratovush.

РАННАЯ ДИАГНОСТИКА ПИЛОРОСТЕНОЗА У НОВОРОЖДЕННЫХ

Аннотация

Врожденный гипертрофический пилоростеноз является одной из тяжелых врожденных патологий желудочно-кишечного тракта у новорожденных, обусловленной гипертрофией мышечного слоя пилорического отдела и нарушением эвакуatsii пищи из желудка в двенадцатиперстную кишку. Частота заболевания составляет 0,5–3 случая на 1000 детей, при этом у мальчиков патология встречается в 4 раза чаще, чем у девочек. Поздняя диагностика пилоростеноза приводит к развитию выраженной гипотрофии, нарушению водно-электролитного баланса и метаболического алкалоза. **Цель исследования:** Оптимизatsiя диагностики врожденного пилоростеноза на основе клинических, рентгенологических и инструментальных методов исследования. **Материалы и методы исследования:** В период 2017-2025 гг. в Андижанском областном многопрофильном детском медицинском центре были комплексно обследованы 125 natsientов с врожденным пилоростенозом. В диагностике применялись клиническое наблюдение, рентгеноконтрастные исследования, ультразвуковое исследование, эндоскопия и лабораторные методы. **Результаты и выводы:** Согласно полученным данным, 103 natsienta (82,4%) были госпитализированы в возрасте от 1 до 3 месяцев, 22 natsienta (17,6%) - в период новорожденности. Основными клиническими симптомами являлись рвота «фонтаном», прогрессирующее снижение массы тела, уменьшение диуреза и усиление перистальтики желудка. Рентгеноконтрастные и ультразвуковые методы продемонстрировали высокую диагностическую информативность. Ранняя диагностика и комплексный подход к лечению врожденного пилоростеноза позволяют предотвратить развитие тяжелых метаболических нарушений и улучшить результаты лечения.

Ключевые слова

врожденный пилоростеноз, гипертрофический пилоростеноз, новорожденные, диагностика, рентгеноконтрастное исследование, ультразвуковое исследование.

Congenital hypertrophic pyloric stenosis is a genetically determined disease, the cause of which is a thickening of the muscular layer of the pyloric part; this condition is associated with a violation of innervation. As a result, the internal diameter of the pyloric area gradually narrows, and food cannot pass from the stomach to the duodenum. There is a correlation between the frequency of occurrence of the disease and the kinship between the parents [2,5].

A familial predisposition has been identified in 6.9% of cases. The population incidence rate is from 0.5 to 3 per 1000 children. One of the characteristic features of this disease is the sharp predominance of boys over girls (4:1). Before the development of surgical treatment, children died from various severe nutritional disorders, dystrophy and associated purulent-septic diseases [1,6].

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The literature provides a detailed description of the clinical manifestations of pyloric stenosis, and in such cases, diagnosis is not difficult. The severity and time of onset of symptoms of pyloric stenosis are determined by the degree of pyloric stenosis and the compensatory capabilities of the child's stomach. The clinical manifestations of the disease are usually detected in the 3rd-4th week of life. After 3-4 feedings, children experience "fountain"-like vomiting. The volume of vomitus exceeds the volume of the last feeding. The absence of bile in them is characteristic of the inability of breast milk to pass into the duodenum. As a result, hypotrophy occurs and gradually increases.

In pyloric stenosis, special attention is paid to the examination of the abdominal cavity: it is necessary to determine the enlargement of the epigastric region against the background of retraction of the lower sections, the “hourglass” sign associated with deep peristalsis of the elongated stomach. The stool is scanty, dark green in color due to the lack of milk and the predominance of bile and intestinal gland secretions.

Diuresis and frequency of urination decrease. Urine becomes concentrated. In severe cases, water-electrolyte metabolism is disrupted due to the loss of chlorine and hydrochloric acid during vomiting [4,5]. This leads to an increase in alkaline reserves in the blood and the development of moderate alkalosis. Diagnosis of pyloric stenosis is based on anamnesis, examination of the patient, and the use of special examination methods (general abdominal radiography and barium stomach radiography). Early diagnosis and timely surgical treatment are extremely important before metabolic disorders (hypotrophy, hypovitaminosis, microelement deficiency, etc.) develop.

The purpose of the study is to optimize the diagnosis of congenital pyloric stenosis by studying the data of clinical, radiological, instrumental, and other examination methods.

Materials and methods. The basis of this work is the results of a comprehensive examination of 125 patients admitted to the Andijan Regional Children's Multidisciplinary Medical Center during 2017-2025.

Results and discussion. According to our data, the majority of patients with congenital hypertrophic pyloric stenosis, 103 (82.4%), were admitted to the clinic at the age of 1 to 3 months, and only 22 (17.6%) were newborns.

The main clinical symptoms that allowed us to diagnose pyloric stenosis were: "fountain" vomiting without bile, progressive weight loss, decreased urination, decreased diuresis, scanty and loose stools, and a pronounced increase in gastric peristalsis, the "hourglass" symptom. We will consider these symptoms separately based on the data of our studies [8].

"Fountain" vomiting - with gastric contents without bile - was a constant and main symptom in all patients with pyloric stenosis. In 91 (72.8%) of the children, vomiting appeared at the age of 2-4 weeks, and in only 34 (27.2%) - in the first week of life. In the process of analyzing anamnestic data, it was found that all patients had occasional vomiting without bile and vomiting with curdled milk from the first days after birth. With the development of the disease and an increase in the volume of the stomach, "fountain" vomiting appeared at the age of 2-4 weeks: the volume of vomited masses significantly exceeded the volume of a single meal. The frequency of "fountain" vomiting during the day reached 4-5 times, that is, less than the number of meals. Prolonged vomiting led to weight loss in children and the development of progressive hypotrophy.

Clinical signs of the disease depend on the degree of pyloric stenosis and are divided into compensated, subcompensated and decompensated forms. As a result of late referral of children with congenital pyloric stenosis to a surgical hospital, grade II hypotrophy was detected in 35 (28%) of the patients at the time of admission, grade III hypotrophy in 51 (40.8%) and grade IV hypotrophy in 15 (12). In addition, 106 (85%) of the patients had “fountain” vomiting for 2 to 6 weeks before admission to the clinic, which led to dehydration and, in some cases, the development of metabolic alkalosis.

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As a result of the progressive course of the disease, the number of urinations per day decreased to 3-5 times in 108 (86.5%) of the children. A decrease in daily diuresis was observed in all patients, and in 14 (11.2%) patients, daily diuresis did not exceed 15-30 ml (normally 600-700 ml per day).

Infrequent stools were noted in 51 (40.8%) children (once every 3-7 days), in 28 (22.4%) patients once a day, and in 43 (34.4%) patients 1-2 times a day, but in very small quantities. In cases of pronounced hypotrophy of the child (53.7%), an “hourglass” symptom is detected, which appears when stroking the anterior abdominal wall in the epigastric region shortly after feeding. In this case, there is increased peristalsis of the stomach walls and the stomach takes the shape of an “hourglass” over the area that prevents the passage of food.

Many patients have had changes in biochemical blood parameters: dysproteinemia, decreased albumin, alpha- and gamma-globulins, chloride levels, and increased fibrinogen levels.

All patients underwent an X-ray examination, which began with a general X-ray of the chest and abdominal cavities in the upright position of the child. In most of them, a large, elongated stomach was visualized, the bottom of which was often located at the level of the pelvic bones or below the umbilicus, and a decrease in the amount of gas in the intestinal loops was noted. The decisive importance in the diagnosis of congenital pyloric stenosis was played by the data of a contrast X-ray examination, which was performed immediately after the general X-ray. In newborns, 5-10 ml of iodolipol was used as a contrast agent, and in infants, 30-50 ml of a 10-20% barium suspension prepared in 10% glucose solution was used. The contrast agent was administered into the stomach through a nasogastric tube.

After 20 and 180 minutes, X-rays were taken with the child in the upright position, and if necessary, repeated images were taken after 6 and 24 hours. If more than half of the contrast material remained in the stomach after 3 hours, this was considered the main radiological criterion for pyloric stenosis. Endoscopic examination revealed a stomach with a pronounced fold, dilation and hyperextension of the antrum of the mucosa. In the area of the pyloric valve, various degrees of stenosis of the pyloric canal were noted, which did not open even when inflated with air. The above symptoms are typical for congenital pyloric stenosis.

Ultrasound examination was performed in 40 (32%) children with suspected congenital pyloric stenosis. This indicates that the diagnostic value of ultrasound examination in this developmental defect is significant.

We believe that it is advisable to premedicate 20-30 minutes before FGS (fibrogastroscopy), which will allow to achieve a good antispasmodic effect during the examination. Later, the widespread use of endoscopy causes some difficulties in the intestines. Therefore, the use of echosonography for the diagnosis of this disease in infants is considered one of the safest and least invasive methods.

Conclusion. Thus, timely diagnosis of congenital hypertrophic pyloric stenosis is based on a comparison of the characteristic clinical signs observed in children in the first days of life with the results of radiocontrast and echosonographic examinations. The introduction of UTT into practice allows to significantly reduce the diagnostic time, as well as to limit the use of radiological examinations in children with congenital pyloric stenosis.

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