OPTIMIZATION OF TREATMENT AND MANAGEMENT TACTICS FOR NECROTIZING ENTEROCOLITIS IN NEWBORNS BORN TO MOTHERS WITH PREECLAMPSIA

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Abstract

Necrotizing enterocolitis (NEC) is one of the most severe gastrointestinal diseases in newborns, particularly affecting premature infants and those with low birth weight. Preeclampsia is a common complication of pregnancy associated with placental insufficiency and fetal hypoxia, which may contribute to impaired intestinal perfusion in newborns and increase the risk of necrotizing enterocolitis. The aim of this study was to analyze current scientific literature on the pathogenesis, risk factors, clinical manifestations, and treatment strategies of NEC in newborns born to mothers with preeclampsia. A literature review was conducted using international databases. The analysis demonstrated that placental insufficiency and chronic fetal hypoxia play an important role in the development of intestinal ischemia, which contributes to the pathogenesis of NEC. Early diagnosis and optimized treatment strategies are essential to reduce morbidity and mortality associated with this condition.

Keywords: necrotizing enterocolitis, preeclampsia, newborns, intestinal ischemia, neonatal hypoxia, intensive care.

ОПТИМИЗАЦИЯ ТАКТИКИ ЛЕЧЕНИЯ И ВЕДЕНИЯ НЕКРОТИЗИРУЮЩЕГО ЭНТЕРОКОЛИТА У НОВОРОЖДЁННЫХ, РОЖДЁННЫХ ОТ МАТЕРЕЙ С ПРЕЭКЛАМПСИЕЙ

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Аннотация

Некротизирующий энтероколит (НЭК) является одним из наиболее тяжёлых заболеваний желудочно-кишечного тракта у новорождённых. Чаще всего данная патология встречается у недоношенных детей и новорождённых с низкой массой тела. Преэклампсия является распространённым осложнением беременности, сопровождающимся плацентарной недостаточностью и гипоксией плода. Эти состояния могут приводить к нарушению кишечной перфузии у новорождённых и повышать риск развития некротизирующего энтероколита. В данной статье проведён анализ современной научной литературы, посвящённой патогенезу, факторам риска, клиническим проявлениям и тактике лечения некротизирующего энтероколита у новорождённых, рождённых от матерей с преэклампсией. Результаты анализа литературы показывают важность ранней диагностики и своевременного применения комплексной терапии для снижения частоты осложнений.

Ключевые слова: некротизирующий энтероколит, преэклампсия, новорождённые, кишечная ишемия, неонатальная гипоксия, интенсивная терапия.

Introduction

Necrotizing enterocolitis (NEC) is a severe inflammatory disease of the gastrointestinal tract in neonates, characterized by intestinal inflammation, ischemia, and necrosis of the intestinal wall. In severe cases, it may lead to intestinal perforation and peritonitis. NEC remains one of the leading causes of morbidity and mortality in neonatal intensive care units worldwide.

The disease primarily affects premature infants and newborns with very low birth weight. Due to the immaturity of the intestinal barrier, underdeveloped

immune response, and unstable intestinal microcirculation, preterm infants are particularly susceptible to ischemic and infectious damage to the intestinal wall.

Several risk factors contribute to the development of NEC, including prematurity, low birth weight, perinatal hypoxia, infections, and disturbances of intestinal microbiota. Feeding practices, particularly early enteral feeding in unstable neonates, may also play a role.

In recent years, increasing attention has been given to maternal conditions during pregnancy as potential contributors to neonatal complications. One such condition is preeclampsia, a hypertensive disorder characterized by arterial hypertension and proteinuria occurring after the 20th week of gestation.

Preeclampsia is associated with placental insufficiency and impaired uteroplacental blood flow, which may lead to chronic fetal hypoxia and intrauterine growth restriction. These conditions may significantly affect neonatal adaptation after birth and increase the risk of gastrointestinal complications, including necrotizing enterocolitis.

Materials and Methods

This study was conducted as a literature review. Scientific publications related to necrotizing enterocolitis and preeclampsia were analyzed to identify key mechanisms, risk factors, and treatment approaches associated with this condition.

Priority was given to peer-reviewed articles published within the last 10–15 years. Additional classical studies on NEC pathogenesis were also included to provide a broader scientific context.

Results and Discussion

Pathogenesis of Necrotizing Enterocolitis

The pathogenesis of necrotizing enterocolitis is multifactorial and involves several interacting mechanisms. According to the literature, three main factors contribute to the development of NEC:

1. intestinal ischemia
2. bacterial colonization

3. immature immune response

Intestinal ischemia leads to hypoxic injury of the intestinal mucosa, resulting in increased intestinal permeability and disruption of the epithelial barrier. This allows bacteria and bacterial toxins to penetrate the intestinal wall and enter systemic circulation, triggering an inflammatory response.

The Role of Preeclampsia

Preeclampsia significantly affects placental circulation and fetal oxygen supply. Placental insufficiency results in reduced blood flow to the fetus and may lead to chronic intrauterine hypoxia.

Studies have shown that newborns delivered from pregnancies complicated by preeclampsia often experience circulatory instability and impaired microcirculation. Reduced intestinal perfusion in these infants may predispose them to ischemic injury of the intestinal wall, increasing the risk of NEC.

Furthermore, intrauterine growth restriction, commonly associated with preeclampsia, has been identified as an independent risk factor for the development of NEC.

Clinical Manifestations

Clinical manifestations of necrotizing enterocolitis may vary depending on the severity of the disease. The most common symptoms include:

- abdominal distension
- feeding intolerance
- vomiting
- bloody stools
- lethargy and signs of systemic infection

In severe cases, intestinal perforation may occur, leading to peritonitis and septic shock.

Radiological findings such as pneumatosis intestinalis and portal venous gas are considered important diagnostic indicators of NEC.

Treatment Strategies

Modern clinical guidelines emphasize a multidisciplinary approach to the management of NEC. Treatment strategies depend on the stage and severity of the disease.

Conservative treatment typically includes:

- temporary discontinuation of enteral feeding
- gastric decompression
- parenteral nutrition
- broad-spectrum antibiotic therapy
- fluid and electrolyte management

Close monitoring in a neonatal intensive care unit is essential.

Surgical intervention may be required in cases of intestinal perforation, necrosis, or failure of conservative therapy. Surgical procedures may include intestinal resection and creation of enterostomy.

Early recognition of symptoms and prompt initiation of treatment significantly improve clinical outcomes.

Conclusion

The analysis of scientific literature demonstrates that newborns born to mothers with preeclampsia represent a high-risk group for the development of necrotizing enterocolitis.

Placental insufficiency, chronic fetal hypoxia, and impaired intestinal perfusion play an important role in the pathogenesis of NEC in these infants. Early identification of high-risk newborns and careful monitoring during the neonatal period are crucial for preventing severe complications.

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