



ORIGINAL ARTICLE

There is an association between disease location and gestational age at birth in newborns submitted to surgery due to necrotizing enterocolitis[☆]

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KEYWORDS

Necrotizing enterocolitis;
Gestational age;
Enterocolitis location;
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Premature

Abstract

Aims: To evaluate if there are differences regarding disease location and mortality of necrotizing enterocolitis (NEC), according to the gestational age at birth, in newborns submitted to surgery due to NEC.

Methods: A historical cohort study of 198 newborns submitted to surgery due to NEC in a tertiary hospital, from November 1991 to December 2012. The newborns were divided into different categories according to gestational age (<30 weeks, 30–33 weeks and 6 days, 34–36 weeks and 6 days, and ≥37 weeks), and were followed for 60 days after surgery. The inclusion criterion was the presence of histological findings of necrotizing enterocolitis in the pathology. Patients with single intestinal perforation were excluded.

Results: The jejunum was the most commonly affected site in extremely premature infants ($p=0.01$), whereas the ileum was the most commonly affected site in premature infants ($p=0.002$), and the colon in infants born at term ($p<0.001$). With the increasing gestational age, it was observed that intestinal involvement decreased for the ileum and the jejunum (decreasing from 45% to 0% and from 5% to 0%, respectively), with a progressive increase in colon involvement (0% to 84%). Total mortality rate was 45.5%, and no statistical difference was observed in the mortality at different gestational ages ($p=0.287$).

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PALAVRAS-CHAVE

Enterocolite
necrosante;
Idade gestacional;
Localização da
enterocolite recém-
nascido;
Prematuro

Conclusions: In newborns submitted to surgery due to necrotizing enterocolitis, the disease in extremely preterm infants was more common in the jejunum, whereas in preterm infants, the most affected site was the ileum, and in newborns born close to term, it was the colon. No difference in mortality was observed according to the gestational age at birth.

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Existe associação entre a localização da doença e a idade gestacional ao nascimento de recém-nascidos operados por enterocolite necrosante

Resumo

Objetivos: Avaliar se há diferença de localização e de mortalidade da enterocolite necrosante (ECN) de acordo com a idade gestacional ao nascimento, em neonatos operados por ECN.

Métodos: Coorte histórica de 198 neonatos operados por ECN em hospital terciário, de novembro de 1991 a dezembro de 2012. Os recém-nascidos operados foram divididos em diferentes categorias de acordo com a idade gestacional (<30 semanas, 30 a 33 semanas e 6 dias, 34 a 36 semanas e 6 dias e ≥37 semanas), e foram seguidos por 60 dias depois da cirurgia. O critério de inclusão foi a presença de achados histológicos de enterocolite necrosante no anatomopatológico, e de exclusão foi a presença de perfuração intestinal única.

Resultados: O jejuno foi mais acometido pela ECN nos prematuros extremos ($p=0,01$); o íleo mais afetado nos recém-nascidos prematuros ($p=0,002$), e o cólon nos recém-nascidos a termo ou próximos ao termo ($p<0,001$). Com o aumento da idade gestacional, observa-se redução do acometimento do jejuno e do íleo (regredindo de 45% para 0% e de 5% para 0%, respectivamente), e aumento progressivo do acometimento do cólon (0% para 84%). A mortalidade total das crianças operadas por ECN foi de 45,5%; não existindo diferença estatística na mortalidade nas diferentes idades gestacionais ($p=0,287$).

Conclusões: Em recém-nascidos operados por enterocolite necrosante, a doença no jejuno foi mais comum no prematuro extremo, no íleo no prematuro, e a doença no cólon nos recém-nascidos próximos ao termo. Não foi observada diferença de mortalidade de acordo com a idade gestacional ao nascimento.

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Introduction

Necrotizing enterocolitis (NEC) is a disease that especially affects preterm infants and those with low birth weight (<2500g).¹ Studies show the existence of an inverse association between mortality and birth weight.² The incidence of NEC is variable, depending on the geographic area, ethnicity, and genetic and environmental factors; despite the improved care and improved survival of an increasing number of preterm infants, its incidence remains high in some countries.³ NEC is the most devastating gastrointestinal disease in neonates, occurring in 0.7 per 1000 patients, and in up to 7% of those hospitalized in neonatal intensive care units (NICUs), with a mortality ranging from 20% to 50%.⁴⁻⁶ There is still a controversy regarding the disease's etiology, pathophysiology, and the importance of all possible causal factors.

During the 1980s, before the age of surfactant's and improved neonatal care, studies on NEC showed that the patients most severely affected by the disease were preterm infants between 33 and 35 weeks of gestation.^{7,8} However, more recent studies have shown a higher frequency of the disease in preterm infants born at 29–31 weeks of gestation.⁸

In addition to the increasing survival of preterm infants, studies also show that the disease's etiology may differ between preterm and full-term infants. In the latter, the heart diseases and other conditions that predispose to intestinal ischemia seem to be more associated with the disease than the intestinal immaturity and greater permeability to the bacteria and food substrates observed in preterm infants.

Several studies have attempted to elucidate the etiology of NEC,^{9,10} and others have investigated potential prevention and treatment strategies.^{11,12} Few studies have attempted to associate gestational age to the intestinal segment most affected by the disease. The present study sought to identify an association between disease location and the gestational age at birth in newborns submitted to surgery due to NEC.

Materials and methods

Newborns submitted to surgery due to NEC (historical cohort) at Hospital da Criança Conceição, Grupo Hospitalar Conceição, Porto Alegre, state of Rio Grande do Sul, Brazil, between November 1991 and December 2012 were evaluated. Inclusion criteria were the histological confirmation

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