Etiology Of Neonatal Peritonitis Treated at The University Hospital Joseph Ravoahangy Andrianavalona, Antananarivo

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ABSTRACT

Neonatal peritonitis is burdened with high morbidity and mortality despite progress in pediatric intensive care. The causal pathologies are multiple. Their knowledge is an important tool for improving care. The objective of our study is to determine the causes of neonatal peritonitis treated in our center.

This is a retrospective, descriptive study of 72 months. The inclusion criteria were newborns less than 28 days old operated for peritonitis. The parameters studied were age, gender, perinatal history, site of perforation, causal pathologies.

Eighteen patients were collected. The average age was 8 days, with extremes of 3 and 25 days. There was a male predominance with a sex ratio of 8. In the prenatal history, 1 case of gestational diabetes and 2 cases of gravidic hypertension were found. The average birth weight was 2730 g with extremes of 2500 g and 3500 g. The site of perforation was at the small intestine (7 cases), the colon (5 cases) and the stomach (4 cases) and there were 2 cases of multiple perforation. Ulcerative-necrotizing enterocolitis and mechanical causes represented the two main etiologies, each representing 44.44% of cases.

Mechanical etiologies which represent 44% of cases could have been prevented by early management of the causal pathologies.

Keywords: Necrotizing enterocolitis, newborn, peritonitis, premature.

I. INTRODUCTION

Neonatal peritonitis is a serious pathology occurring on a fragile baby [1]. It is burdened with a high rate of mortality that can range from 40 to 70% of cases even in developed countries with adequate pediatric intensive care [2]. So far, there is no study evaluating the overall mortality of neonatal peritonitis in our country. Regarding the causes, several pathologies can be incriminated and the management strategy depends on them. Knowledge of these etiologies is essential to reduce the morbidity and mortality rate by improving the time to diagnosis and treatment. In this perspective, our study aims to determine the main etiologies of neonatal peritonitis seen in the Pediatric Surgery Department of the Joseph Ravoahangy Andrianavalona University Hospital Center (CHU JRA) Antananarivo.

II. OUR STUDY

This is a retrospective, descriptive study of 72 months, from May 2012 to May 2018, at the Pediatric Surgery Department of the CHU HJRA Antananarivo. Newborns less than 28 days old operated for peritonitis were included. Cases diagnosed in our center but transferred elsewhere or who died before surgery were excluded. The parameters studied were age, gender, prenatal history, term of pregnancy, birth weight, site of perforation found intraoperatively, causal pathologies.

III. RESULTS

Eighteen cases were collected. The average age was 8 days, with extremes of 3 and 25 days. There was a clear male predominance with a sex ratio of 8. No prenatal history was noted in 15 cases. And there was 1 case of gestational diabetes and 2 cases of gravidic hypertension. Eleven of our patients were born at term and 4 premature. The term of pregnancy is unknown for 3 cases. The average birth weight was 2730 g with extremes of 2500 g and 3500 g. The site of perforation was the small intestine (7 cases), the colon (5 cases) and the stomach (4 cases). There were 2 cases of multiple perforations. Concerning the etiologies (Table I), for the small intestine’s perforation, it was an ulcerative-necrotizing enterocolitis (ECUN) in 3 cases, necrosis caused by volvulus and flange (3 cases), a diverticulum of Meckel (1 case). For the colon, there were 3 cases of ECUN, one case of diastatic perforation following an anorectal malformation, one case of necrosis on strangulated hernia. For the stomach, there was an iatrogenic cause (3 cases) and one case of spontaneous perforation. The 2 cases of multiple perforations were due to ECUN.
TABLE 1: ETIOLOGIES OF NEONATAL PERITONITIS

| Site of Perforation | Etiologies | Number |
|---------------------|------------|--------|
| Small intestine     | Ulcerative-necrotizing enterocolitis | 3      |
|                     | Necrosis by volvulus                | 2      |
|                     | Necrosis by flame                   | 1      |
|                     | Meckel's diverticulum               | 1      |
| Colon               | Ulcerative-necrotizing enterocolitis | 3      |
|                     | Diastatic perforation               | 1      |
|                     | Strangulated Hernia                 | 1      |
| Stomach             | Iatrogenic                          | 3      |
|                     | Spontaneous perforation             | 1      |
| Multiple            | Ulcerative-necrotizing enterocolitis | 2      |

IV. DISCUSSION

Neonatal peritonitis is a serious pathology occurring on a fragile baby. Its mortality can range from 40 to 70% [1], [2]. The real prevalence is difficult to determine because of cases of death before hospital admission, especially for poor countries. The average hospital frequency in our study was 3 cases per year.

Some maternal pathologies, particularly pregnancy-induced hypertension, influence the term of pregnancy. Subsequently, prematurity and low birth weight are among the risk factors for neonatal gastrointestinal perforation [3].

Regarding the etiology in our series, ECUN represents one of the main causes of neonatal peritonitis and concerned more than 44% of cases (8 cases out of 18). It is an extreme diagnostic and therapeutic emergency because it is life-threatening in the short term in 16 to 42% of cases [4].

The other important cause found with the same frequency as ECUN is the mechanical cause. This group includes iatrogenic perforation of the stomach and intestinal perforation following an extrinsic obstacle. In the literature, gastric perforation constitutes 10 to 16% of gastrointestinal perforations. With the chemical perforation that it generates followed by a rapid installation of respiratory distress by abdominal distension and diaphragmatic irritation, it is burdened with a high mortality rate [5]. Early treatment is the only way to improve the prognosis [6]. For our series, 3 cases of gastric perforation were caused by the placement of a nasogastric tube. Compliance with safety measures and mastery of the placement technique could prevent these incidents. For intestinal perforation following an extrinsic obstacle, we found: necrosis by volvulus and by flame, diastatic perforation following an anorectal malformation and a strangulated hernia. Volvulus and flame in the newborn usually follow malrotation. The risk is the possibility of total necrosis of small intestine in case of late treatment [7].

Diastatic perforation following an anorectal malformation is a very rare situation. The intraintestinal pressure generated by the occlusion is responsible for acute dilation followed by wall ischemia and perforation [8], [9]. This complication is specific to forms without fistula [10]. About hernia, as soon as the diagnosis is made, the surgery is essential without waiting for the strangulation. In Africa and Madagascar, ignorance and poverty of the population would be the main causes of delayed diagnosis [11]. In total, the mechanical causes concern 44.44% of our patients (8 cases out of 18). All these cases could have been avoided if the diagnosis and management of the causal pathologies were early.

The rarer causes in our series are Meckel's diverticulum and spontaneous gastric perforation. Meckel's diverticulum is an intestinal malformation often latent. For the symptomatic forms, the complications reveal the diagnosis [12]. Spontaneous gastric perforation in children is rare and has a bad prognosis [13], [14]. It occurs in 40 to 50% of cases in premature babies. Maternal diabetes, toxæmia of pregnancy, placenta previa are among the risk factors [15].

V. CONCLUSION

The two main causes of neonatal peritonitis in our series are ulcerative-necrotizing enterocolitis and mechanical causes. The best solution to improve the situation is preventive: good control of medical acts, early diagnosis and management of causal pathologies.

CONFLICT OF INTEREST

We solemnly declare that this article does not contain any conflict of interest.

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