IMPLICATIONS OF PREMATURE RUPTURED MEMBRANES LABOR IN NEWBORNS' INFECTIOUS PATHOLOGY

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Abstract

Objectives: Evaluation of the premature ruptured membranes incidence in a neonatology service, identification of microbial agents involved in producing infections with intrapartum onset and analysis of clinical and evolutive parameters involved in these cases.

Material and method: Anamnestic, clinical and paraclinical data research, on all newborns resulted from premature ruptured membranes labors registered in year 2007 in the "Bega" Hospital in Timisoara.

Results: In the studied sample, 7.19% of the total cases have presented premature rupture of membranes. It can be noticed an increased incidence of this kind of cases in newborns with a low birth weight (three times bigger than in newborns with normal birth weight). The distribution of cases according to the ovular rupture duration indicates ½ for 12-24 hours, ¼ between 24 and 48 hours and ¼ over 48 hours. Most frequently involved infectious agents were staphylococcus aureus and gram-negative bacillus. A manifest infection was identified in 40.83% of cases; a generalized infection was found to be present especially in newborns with low birth weight.

Conclusions: The risks for newborns developed infections increases with the prolonging of premature ruptured membranes labor's duration and the newborns' low birth weight. Prolonged labor in cases with premature rupture of membranes indicates the need for starting early antibiotic therapy in resulting newborns.

Key words: premature rupture of membrane, newborn, infection

Introduction

The premature rupture of the amniotic membranes (PROM) represents a clinical and biological evolving entity which is rather frequent and with a significant high-risk degree at newborns with low birth weight (1). Neonatal infections continue to be major causes of morbidity and mortality in the newborn. This is despite improvements in antimicrobial therapy, advances in neonatal life support measures, and the prompt recognition of perinatal risk factors for infection (2, 3). Perinatal mortality and morbidity associated with preterm delivery remain a major health problem, although improved methods of obstetrics care, delivery, and neonatal care for the preterm (4).

The objectives of the study are:

- Appreciating the PROM incidence in a neonatology department on a limited period of time;
- Organization of PROM on stages according to the latency period (the time interval from the appearance of PROM till birth) and the newborn category to which it appeared;
- Identifying the microbial agents involved in producing the infections with intrapartum debut;
- Analyses of the clinical-evolving parameters of the cases included in the studied sample;
- Identification of the means and measures capable to reduce the incidence of PROM and of the consecutive complications through methods of rapid diagnosis and efficient therapy.

Material and methods

Anamnestic, clinical and paraclinical data research, on all newborns resulted from premature ruptured membranes labors registered between January 1st 2007 and December 31st 2007 in the Neonatology Department Bega, Timisoara.

Results and discussions

The studied sample was of 1668 newborns, of which a number of 120 cases (7.19%) had PROM. This incident had a greater frequency at newborns with a low birth weight, 3 times higher than the category of newborns with a weight over 2500 g (Tab. 1).

Table 1. Distribution of PRM in relation to their birth weight.

Weight at birth	Total alive newborns	PRM (Nr.)	PRM (%)
< 1000 g	6	1	16,66
1001-1500 g	29	6	20,68
1501-2000 g	41	10	24,39
2001-2500 g	78	11	14,10
> 2500 g	1514	92	6,03
TOTAL	1668	120	7,19

The repartition of the cases in relation to the duration of ovular rupture reveals a balance of almost 1\2 during the period 12-24 hours, 1\4 between 24-48 hours and approximately 1\4 in the period over 48 hours.

In this distribution the high frequency of the interval of over 24 hours seems suggestive, a period associated with a high risk of infection. Analyzing the incidence of the infection in the studied sample, it may be noticed that the infection appeared at 49 newborns (40.83%), the **generalized infection (GI)** appeared especially at newborns with low birth weight and the **local forms (LF)** to those with weight over 2000 g (Tab. 2). The infection and the risk of generalized infection rise proportionally to the immaturity degree and the weight handicap of the newborn.

The risk of infection was high when PRM was prolonged and when it was associated with a maternal chorioamnionitis and with fetal or neonatal suffering. The cases which had PROM the aspect of the amniotic liquid was modified in proportion of 20.83%.

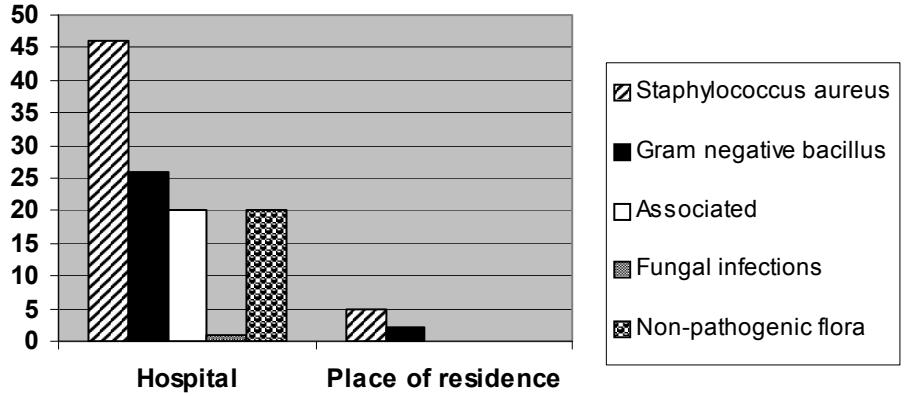
Table 2. Distribution of cases in relation to the incidence of the infection

Weight at birth	GI (Nr.)	GI (%)	LF (Nr.)	LF (%)
< 1000 g	1	100	0	0
1001-1500 g	2	33,33	2	28,57
1501-2000 g	6	60	2	20
2001-2500 g	2	18,18	6	54,54
> 2500 g	2	3,26	26	28,26
TOTAL	13	10,83	36	30

Most of the studied PROM cases (95) were graded with an APGAR score between 8-10, 12 cases with APGAR 6-7 and 6 cases with a score under 5.

113 (94.16%) of the newborns with PROM were born in the maternity, the rest being born at the place of residence. Of the etiological agents, the staphylococcus aureus (42.50%) and the gram-negative bacillus (23.33%) dominate, the place where the labor with PROM happened being of no importance (Fig. 1).

Fig.1. Distribution of cases in relation to the etiological agent and the place of birth



Further on we studied the precocious neonatal mortality at those who had PROM for a period longer than 24 hours. In relation to the total number of cases included in the lot, precocious neonatal mortality represents 4.16% (Tab. 3). The risk of precocious neonatal mortality rises proportionally and significantly in relation to low birth weight in PROM cases.

Table 3. Predominance of precocious neonatal mortality in PRM cases.

Weight at birth	Total alive NB	PRM	Deceased
< 1000 g	6	1	0
1001-1500 g	29	6	2
1501-2000 g	41	10	1
2001-2500 g	78	11	1
> 2500 g	1514	92	1
TOTAL	1668	120	5

The causes that contributed to the lethal evolution:

- cerebral hemorrhage (5),
- generalized infection,
- respiratory distress syndrome,
- congenital malformations (6, 7).

All PROM cases were under anti infectious treatment after prevailing the bacteriological probes, the therapy being changed when necessary, according to the antibiotic sensitivities.

Conclusions

1. Incidence of prolonged PROM (over 24 hours) is significantly high to the newborns with low birth weight (under 2500 g).

2. The risk of generalized neonatal infection rises according to the duration of the ovular rupture and low birth weight.

3. The precocious neonatal mortality of the newborns with a weight under 2500 g is significantly higher if the baby is born after prolonged PROM.

4. Prolonged PROM imposes a precocious antibiotherapy for the newborn, in relation to the etiology and the antibiotic sensitivities.

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