



MORBIDITY AND MORTALITY OF PRETERM NEWBORNS OF MOTHERS WITH HISTOLOGICAL CHORIOAMNIONITIS

Neonatology

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ABSTRACT

Infected amniotic membranes, called chorioamnionitis, can cause fetal infection as a consequence of proximity. A retrospective cross-sectional study, 274 preterm infants born within a year were analyzed and placentas from each preterm infant were classified as positive or negative chorioamnionitis and in the records of preterm infants, those with early neonatal sepsis, perinatal asphyxia, respiratory failure, clinical and / or laboratory changes within the first 72 hours of life. The data showed that there was greater morbidity and mortality in preterm infants with positive chorioamnionitis

KEYWORDS

Early neonatal sepsis; Premature; Chorioamnionitis.

Infected amniotic membranes, called chorioamnionitis, can cause fetal infection as a consequence of this proximity^{1,2}. Evidence suggests that chorioamnionitis is an important determinant of parturition, preterm births, early neonatal sepsis and even death^{3,4}.

Chorioamnionitis not only causes premature births, but is also associated with fetal complications with increased morbidity and mortality. The incidence of clinical chorioamnionitis is inversely proportional to gestational age^{5,6,7,8}.

The risk of neonatal sepsis in newborns of mothers with fever during labor or the diagnosis of chorioamnionitis is low, about 0.24%, a rate lower than 1 in 400 pregnant women in labor^{9,10}. This diagnosis can be made by the maternal clinic at the time of labor and / or laboratorially by the examinations taken shortly before delivery¹¹, but it is the morphological examination of the placenta with amniotic infection that constitutes the gold standard for the diagnosis of chorioamnionitis¹².

Culture may fail to diagnose amniotic infection in up to 42% of chorioamnionitis and in cases of premature rupture of membranes¹³, because chorioamnionitis may result from both intact bacteria and their products released after antimicrobial death of the bacteria¹⁴.

Methodology

Retrospective cross-sectional study in which all the placentas of the puerperal women admitted to the Maternity Hospital of the University Hospital Cassiano Antônio de Moraes (HUCAM), Vitória-Espírito Santo, Brazil, from January 1, 2012 to December 31, 2012, the histological diagnosis of chorioamnionitis was made by lamination, by conventional histopathology or by both was used.

All records of preterm infants born in the same period were selected and identified those with early neonatal sepsis, perinatal asphyxia, respiratory insufficiency requiring respiratory support, clinical and / or laboratorial changes in the first 72 hours of life, through: APGAR less than or equal to 5 in the fifth minute of life, need for respiratory support, heart rate; respiratory frequency; axillary temperature; mean blood pressure;

hemogram parameters such as: leukocytosis or leukopenia, neutrophilic index, thrombocytopenia; PCR and blood culture, and parameters of normality according to birth weight, gender and gestational age, calculated preferentially by the first trimester obstetric ultrasound or by the Capurro method.

Results:

In the year 2012, 1187 babies were born in HUCAM, of which 357 were preterm, and the study excluded premature infants with TORSCH

(n = 24), cases with major congenital malformations (n = 10), cases where they were not (n = 30) and cases in which the placenta was not examined (n = 19), so for the statistical analysis 274 preterm infants were selected.

Table 1 shows the clinical characterization of the 274 preterm infants of mothers with and without chorioamnionitis in the first 72 hours of life. In 118 patients the hemogram was not performed due to two factors, transfer before the first 24 hours of life or absence of risk factors for early neonatal sepsis, and 78 (28.5%) were transferred to other Neonatal Intensive Care Units overcrowding of HUCAM.

Table 1 - Demographic data and clinical characterization of 274 preterm infants of mothers with and without chorioamnionitis in the first 72 h of life.

Variables	n	%
Gender		
Male	141	51,5
Female	133	48,5
APGAR 5' min		
Less than or equal to 5	14	5,1
Greater than 5	260	94,9
Gestational age and birthweight combined		
Small for gestational age	82	29,9
Adequate for gestational age	184	67,2
Large for gestational age	8	2,9
Ventilatory Support		
CPAP (continuous positive air pressure)	91	33,2
VPM (mechanical pulmonary ventilation)	63	23,0
Ambient air	116	42,4
No information	4	1,5
Rodwell Score (number of leukocytes, neutrophilic index and platelets)		
Score 0	59	21,5
Score 1	68	24,8
Score 2	13	4,7
Score 3	15	5,5
Score 4	1	0,4
No information	118	43,1
Outcome		
Discharge from hospital	169	61,7
Transfer	78	28,5
Death	27	9,9
Total	274	100,0

birth weight, length at birth, mean arterial pressure, leukocyte number and C-reactive protein. (Table 2 and 3).

Table 2 - Demographic and evolutionary aspects of 274 preterm infants of mothers with and without Chorioamnionitis.

Variables	Chorioamnionitis				p-value
	Negative		Positive		
	n	%	n	%	
Gender					
Male	109	51,2	32	52,5	0,859
Female	104	48,8	29	47,5	
APGAR 5'					
Less than or equal to 5	6	2,8	8	13,1	0,004
Greater than 5	207	97,2	53	86,9	
Gestational age and birthweight combined					
SGA (small for gestational age)	65	30,5	17	27,9	0,689
AGA (adequate for gestational age)	141	66,2	43	70,5	
LGA (large for gestational age)	7	3,3	1	1,6	
Ventilatory Support					
CPAP (continuous positive air pressure)	69	33,0	22	36,1	0,052
VPM (mechanical pulmonary ventilation)	40	19,1	23	37,7	
Normal breathing	100	47,8	16	26,2	
Rodwell Score					
Score 0 a 2	112	92,6	28	80,0	0,031
Score 3 ou 4	9	7,4	7	20,0	
Hospital Outcome					
Discharge from hospital	145	68,1	24	39,3	0,000
Transfer for other hospital	56	26,3	22	36,1	
Death	12	5,6	15	24,6	

Table 3 - Clinical and laboratory aspects of 274 preterm infants of mothers with and without chorioamnionitis

Variables	CAM*	n	Median	Average	Standart Deviation	p -value
Gestational Age	Negative	213	34,50	33,78	3,03	0,000
	Positive	61	33,00	31,47	4,33	
Birthweight (gr)	Negative	213	2140,00	2118,17	771,65	0,000
	Positive	61	1832,00	1697,21	729,48	
Length at birth	Negative	209	44,00	43,37	4,47	0,001
	Positive	58	42,00	40,60	5,98	
Cardiac frequency	Negative	207	148,00	147,86	15,68	0,141
	Positive	55	150,00	150,60	17,54	
Axillary temperature	Negative	157	36,90	36,89	0,44	0,336
	Positive	50	36,90	36,96	0,49	
Mean Blood pressure	Negative	156	36,00	35,87	7,82	0,004
	Positive	49	32,00	32,18	7,56	
Leukocytes	Negative	123	10100,00	10705,34	4337,65	0,043
	Positive	36	12400,00	13778,89	8479,59	
Immature neutrophils	Negative	121	2,00	3,02	2,96	0,302
	Positive	36	3,00	6,62	11,16	
Neutrophils	Negative	121	49,00	48,63	12,67	0,959
	Positive	36	48,50	48,50	15,00	
Platelets	Negative	123	266,00	73993,30	111060,59	0,256
	Positive	36	464,50	93709,39	109828,72	
CRP	Negative	100	2,40	4,57	5,98	0,001
	Positive	33	6,70	10,97	13,37	

* CAM=Chorioamnionitis histological

Discussion:

Of the preterm infants selected, 61 (22.2%) were positive for chorioamnionitis and 213 (77.8%) were negative. Anblagan D, et al found in a sample of 90 patients, 26 (29%) cases were positive for chorioamnionitis and 64 (71%) were negative¹⁵.

Gestational age in the preterm group without chorioamnionitis was higher than in the preterm group with chorioamnionitis and is the major risk factor for preterm birth and the incidence is strictly related to gestational age¹⁶.

The group of premature infants with positive chorioamnionitis had more asphyxia, that is, Apgar less than or equal to 5 in the fifth minute of life and asphyxia clinic compared to those with negative chorioamnionitis, showing that these premature infants had greater intrauterine and / or during labor. Recent studies suggest that there is a significant lesion in the cerebral white matter of premature infants of mothers with chorioamnionitis and with more severe involvement of the cases^{1,15}.

The group of preterm infants with positive chorioamnionitis had a greater need for mechanical pulmonary ventilation, lower mean arterial pressure demonstrating more severe respiratory insufficiency and more hemodynamic instability than premature infants with negative chorioamnionitis¹⁸.

Axillary temperature did not have a statistically significant difference between the two groups. Although it has low sensitivity, axillary temperature is highly specific for bacterial infection in premature and term¹⁷.

When comparing the laboratory tests of infectious screening, there was no statistically significant difference between the two groups, but C-reactive protein was higher in the preterm group with chorioamnionitis. Leukocytosis and positive C-reactive protein indicate that there is a high probability of early neonatal sepsis in the newborn.

The preterm group with positive chorioamnionitis had more deaths than the group of premature infants with negative chorioamnionitis, showing the highest clinical severity of preterm infants born infected. Perinatal factors, that is, the conditions of labor and gestation, have a significant impact on the causes of death in premature infants¹⁸.

Erdermir G, et al, concluded that chorioamnionitis is not the only risk factor for premature births, but associated with neonatal complications increases mortality in this age group¹¹.

Yamada N et al found in their study the incidence of very low birth weight preterm infants, neonatal sepsis, intraventricular hemorrhage, and chronic lung disease increased with increased maternal inflammation and maternal sepsis, and it was statistically significant to be associated with high levels of maternal chorioamnionitis¹⁹.

Conclusion

The study demonstrated a greater association between histological chorioamnionitis and morbidity and mortality in preterm infants compared to the absence of chorioamnionitis: - Early neonatal sepsis: 3 times higher;

- Perinatal asphyxia: 5 times greater;
- Respiratory support: 50% more;
- Mortality: 5 times higher.

With the anticipation of intensive care and antimicrobial support for preterm infants in mothers with positive chorioamnionitis, it will have fewer complications, therefore lower morbidity and mortality.

By decreasing the deaths of preterm infants due to infection due to maternal chorioamnionitis, we will be able to reduce early neonatal mortality in Brazil.

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