Chlamydia trachomatis Pneumonia in the Early Neonatal Period

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Citation

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Abstract

Background: Classically, Chlamydia trachomatis (Ct) pneumonia is recognised 4 to 11 weeks after birth. However, some reports have described the early presentation associated with a respiratory signology, basically before 8 days of life. Objective: To describe in cases series the clinical behaviour, the characteristics of the laboratory examinations and the radiological alterations presented in nine patients less than 8 days with a positive culture for Ct during January 2005 through December 2007. Methods Ct was identified through culture of bronchial aspirates, using a sterile Dacron swab which was maintained in 0.2 mL of 2SP transport media (Sacarose phosphate pH 7.2, supplemented with 10% fetal calf serum and antibiotics). McCoy cells in culture were inoculated with this media. Identification of Ct was made by direct immunofluorescence using specific anti-Chlamydia monoclonal antibodies, and by Polymerase Chain Reaction (PCR).
Results: Taquypnea, pulmonary reticulo- nodular infiltrate and eosinophilia were the most frequent clinical signs. No other microorganism was identified. Treatment with chlarithromycin was effective in all cases.Conclusions This study support the early pulmonary infection by Chlamydia trachomatis as an illness, which must be suspected and researched in the neonatal, above all in premature neonates, with clinical symptoms of respiratory distress, without data of systemic inflammatory response and with radiographic alterations.

INTRODUCTION

In recent years, the importance of Chlamydia trachomatis as a respiratory pathogen in the neonatal stage has increased. The infection is the consequence of the product passing through the birth channel, associated to omphalitis, otitis, pharyngitis, conjunctivitis and pneumonia.[1-2]

Pulmonary disease in the newborn, without an antecedent of conjunctival infection is observed in the preterm newborn and it is present in a range from 3 to 18% of all babies born to infected mothers. Under normal circumstances, baby Ct infection is recognized between 4 and 11 weeks of life, it is not fatal and a benign course is usually observed. However, there are reports of at least 30 cases in which clinical symptoms of pneumonia have been found in the early neonatal period.

This report is aimed at describing the clinical behaviour, the characteristics of the laboratory examinations and the radiological alterations presented in patients less than 8 days with a positive bronchial samples cultures for Chlamydia trachomatis..

The cases were presented in the National Institute of Perinatology, a national reference center for high risk pregnancies in Mexico City during January 2005 through December 2007.

METHODS.

A total of 1,500 to 2,000 newborns for year are received at the Neonatal Intensive Care Units of the National Institute of Perinatology and at least 50-100 of them had indication for specific search of Chlamydia trachomatis, Ureaplasma urealyticum, Mycoplasma hominis or sintitial respiratory virus through culture or molecular search of bronchial aspirates. Nine newborns with early start of respiratory signs with respiratory support and positive identification of Ct before 8 days of life were studied.

Ct was identified through culture of bronchial aspirates made through suctioning with a suction catheter into endotracheal tube with collection of specimen, which was maintained in 0.2 mL of 2SP transport media (Sacarose phosphate pH 7.2, supplemented with 10% fetal calf serum and antibiotics). McCoy cells in culture were inoculated with this media.

Identification of Ct was made by direct immunofluorescence using specific anti-Chlamydia monoclonal antibodies (image 1), and by Polymerase Chain Reaction (PCR) (image 2).

Figure 1

Image 1. Direct immunofluorescence positive using specific anti-Chlamydia monoclonal antibodies. (Elementary bodies)

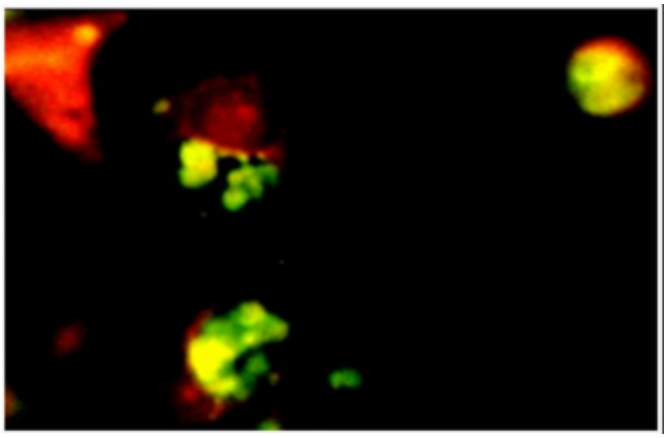
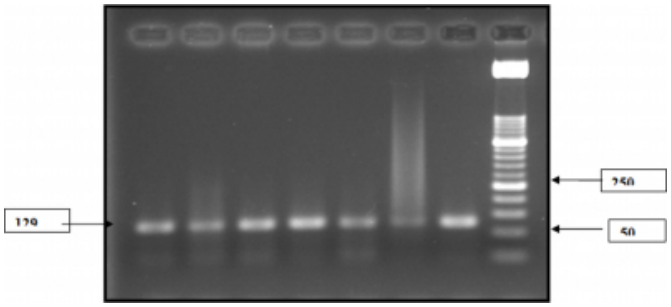


Figure 2

Image 2. Polymerase Chain Reaction positive of 7/9 patients with pneumonia and immunoflurescence positive, in the early neonatal period (see the lines in 129 base pairs)



Clinical follow up of patients was retrieved using a uniform protocol. This information included clinical data, laboratory results (microbiology, hematology) and radiological interpretations. Maternal serum and infantile serum did not obtained

RESULTS

Nine premature newborns were found to have clinical signs of respiratory distres before 8 days of life with positive cultures and PCR for Chlamydia trachomatis in bronchial samples. The average of the gestational age was 32.2 ± 3.1 weeks; the average weight at birth was 1604 ± 701 grams; 5 (55.5%) were females. Vaginal acquisition was established in 8 (88.8%) patients.

The average age on taking the culture was 5.3 days, with a median of 6 days. A positive culture was found in patients on the second day of life.

The start of the clinical manifestations was observed with a mean and median of 2 days, an average of 2.9 ± 1.1 days. The most frequent respiratory manifestations were tachypnoea; the rest of the clinical data and alterations in X-rays are reported in Table 1.

Figure 3

Table 1 Clinical, laboratory and radiological data found in the evolution of the 9 patients diagnosed with early infection by in the National Institute of Perinatology.

Variable	0 to 7 days n (%)
Tachypnoea	9 (100)
Apnoeas	4 (44.4)
Fever	2 (22.2)
Desaturation	6 (66.6)
Bronchospasm	1 (11.1)
C-Reactive Protein > 6mg/dL	3
Eosinophilia (> 700 ceL/dL)	4 (44.4)
Atelectasis	4 (44.4)
Recticular-nodular infiltrate	7 (77.7)
Radioopacity	2 (22.2)

None of the patients presented conjunctival secretion, and therefore no cultures were taken. There was no isolation of other concomitant microorganisms.

On suspecting neonatal sepsis, ampicillin and amikacin in 7 patients was started, and vancomycin and cefotaxime in two. Subsequently and with the positive result for Chlamydia trachomatis claritromycine was administered at a dose of 15mg/kg/day; 6 for 14 days and 3 patients for 21 days. All the patients improved with this treatment; two (22.2%) presented association with chronic neonatal pulmonary disease.

Seven maternal cervicovaginal cultures were reported positive with Ct during the pregnancy. And treatment with azytromicine was administrated. Posterior culture control did not make in that patients.

DISCUSSION

In articles from around the World, there are reports of at least 31 cases (see Table 2) in which clinical symptoms of pneumonia have been found in the early neonatal stage (before 7 days of life); with the isolation of Chlamydia trachomatis.

Figure 4

Table 2. Characteristics found in the patients reported with early infection by Chlamydia trachomatis in previous studies

Author	Year	# Cases	Clinical Manifestations (n)	Laboratory	Radiology
Mardh[1]	1984	1	Respiratory distress Death	Leukocytosis	Bilateral parenchymatous infiltrates Pneumothorax
Amato[2]	1988	1	Tachypnoea Respiratory distress	Bandemia Monocytosis Thrombocytopenia	Bilateral hypoexpansion Parenchymatous infiltrate
Thorp [3]	1989	1	Foetal death	Normal	NR
Sollecito[4]	1992	12	Breathing stridor (1) Apnoeas (8) Respiratory distress (12)	Eosinophilia (4)	Pneumothorax (1) Cystic emphysema (1) Fine reticular infiltrate (1)
Colarizi[5]	1996	8	Respiratory distress (8) Apnoea (4) Death (3)	Eosinophilia (3)	Minor pulmonary changes (1) Pneumonic changes (1)
Niida[6]	1998	2	Fever (2) Tachypnoea (2) Cyanosis (1) Conjunctivitis (2)	PCR > 6 mg/dL (2) Leukocytosis e/ eosinophilia (2)	Nodular reticule infiltrate (2)
Numazaki[7]	2003	5	Tachypnoea (3) Cyanosis (1) Dyspnoea (1)	Chorioamnionitis (1) PCR > 6mg/dL(2) Leukocytosis (3) Eosinophilia (2)	Recticular-nodular infiltrate (4) Pneumonia (1)

In our results, 7/9 newborns were premature and 6 presented a two-phase behaviour similar to that described previously. Chlamydia trachomatis was isolated in them before 8 days of life. The early infection in the term newborn has been described in others researchs[7]

All our patients presented symptoms of pulmonary compromise, which coincides with that described in the previous cases[4-10]; where the most frequent clinical data is the presence of Tachypnoea in 100% of the cases and the presence of apnoeas in 44%.

This study also corroborates that the presence of eosinophilia in the haematic biometry and the C-reactive protein above 6 mg / dL are the most frequently laboratory data found although in less than 50% of the cases.

Like in the mentioned studies, the presence of reticular nodular infiltrate, atelectasis and a lower proportion of condensations, is frequent in the X-ray studies of these patients.

Calculated prevalence of early Ct neonatal infection in our population is 0.43 cases/1,000 live newborns. However, the data given are uninterpetable, because, this study only report a case series and may be we could excluded patients with early symptoms and positive cultures obtained after 8 days of life.

We did not search the possibility of intrauterine infection at late pregnancy, because it was not the study objective. The design is not sufficient to make any conclusions as to timing of the infection.

The results reported in those studies suggest the early pulmonary infection by Chlamydia trachomatis as an illness, which must be suspected and researched in the neonatal, above all in premature neonatals, with clinical symptoms of respiratory distress, without data of systemic inflammatory response and with radiographic alterations. Our results as well as other investigators demonstrate the clinical characteristics of Ct respiratory tract infections among infants in early neonatal period.

In spite of being found in 70% of the cases, the presence of eosinophilia is a patient with respiratory distress and radiographic alterations must make us suspect an early infection by Chlamydia trachomatis in the neonatal.

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