Respiratory infection due to *Chlamydia trachomatis*, four cases report☆

Infección respiratoria por Chlamydia trachomatis*, a propósito de 4 casos*

Pneumonitis due to *C. trachomatis* is one of the most common causes of afebrile pneumonia in early childhood, occurring between the 3rd and 12th week postpartum. Patients present with a runny nose and cough that progressively worsen.[1,2] This subtle clinical picture frequently leads to delayed diagnosis, it then being able to evolve into serious forms, and become complicated with apnoea pauses. It is a disease that requires high clinical suspicion, and therefore we consider it of interest to describe the typical form of presentation with the aim of facilitating the diagnostic keys that allow for its detection.

We describe 4 cases of patients admitted with pneumonitis due to *C. trachomatis*. The epidemiological characteristics are collected in Table 1. Note that they were young mothers, with no record of sexually transmitted disease.

All presented with runny nose in previous days and respiratory distress, 3/4 patients presented with cough; one related fever and another conjunctivitis, on diagnosis. None presented with apnoea pauses. Table 1 shows the additional tests on admission, with eosinophilia in all infants. Gene amplification was performed in all cases in nasopharyngeal aspirate, with 4/4 positive, thus confirming infection by *C. trachomatis*. During admission all received treatment with oral azithromycin for 5 days and required respiratory support with nasal cannula for hypoxaemia or respiratory distress, with one of them requiring high flow oxygen therapy. Median hospital stay was 6.5 days, all evolving favourably and without subsequent complications.

The incidence of pneumonitis due to *C. trachomatis* in infants is unknown, but given the scarce symptomatology that it produces in the pregnant woman (it is the most frequent sexually transmitted infection in our country)[3] and the subtle clinical picture presented by the infant, it is probably an underdiagnosed entity.

Our patients had a median age at diagnosis of 2.3 months, similar to published data.[4,5] Fever was not a common symptom in these patients, who normally consult for mucus and bouts of cough, with progressive worsening and onset of respiratory distress.[6,7] This clinical presentation, typical of a pertusoid picture, justifies the request for microbiological study to rule out infection by *B. pertussis*, whooping cough being one of the main differential diagnoses. Rapid diagnostic tests for RSV and flu virus were also performed, as well as PCR of other respiratory viruses, only detecting rhinovirus in one patient, this case being considered a coinfection by both agents.

Eosinophilia is one of the main diagnostic keys of this entity. In our cases, all presented with moderate eosinophilia (600-1,100 eosinophils/μl). To confirm infection by *C. trachomatis* genomic

Table 1
Epidemiological characteristics and summary of additional tests.

	Patient 1	Patient 2	Patient 3	Patient 4
Age on admission	2.6 months	2.9 months	13 days	2 months
Sex	Boy	Boy	Girl	Boy
Maternal history and pregnancy				
Age	27	18	33	27
From	Ecuador	Dominican Republic	Spain	Spain
Monitored pregnancy	Yes	Yes	Yes	Yes
STI in pregnancy	No	No	No	No
Delivery	Natural	Natural	Natural	Natural
Lab tests on admission				
Leukocytes	21,200/μl	9,900/μl	12,500/μl	12,700/μl
Neutrophils	7,700/μl	3,200/μl	4,625/μl	4,572/μl
Lymphocytes	11,200/μl	4,900/μl	5,375/μl	5,842/μl
Eosinophils	1,100/μl	600/μl	750/μl	1,016/μl
Platelets	642,000	444,000	329,000	596,000
PcR (mg/dl)	8.01	< 0.29	1.2	2.05
PCT (μg/l)	—	0.10	0.20	0.10
Image				
Chest X-ray	Alveolar infiltrates in RML and LLL	Bilateral infiltrate with cardiac silhouette effacement	Atelectasis in both lung bases	No pathological findings
Microbiology				
RSV rapid test	—	—	Negative	Negative
Flu rapid test	Negative	—	Negative	Negative
PCR (NPA) respiratory viruses	*Rhinovirus*	Negative	—	—
PCR (NPA) *B. pertussis*	Negative	Negative	—	Negative
PCR (NPA) *Chlamydia*	Positive	Positive	Positive	Positive
Serology *Chlamydia*	IgM^+ IgG^-	IgM^+ IgG^+	Insufficient sample	IgM^-, IgG^+

NPA: nasopharyngeal aspirate: STI: sexually transmitted infection; LLL: left lower lobe; RML: right middle lobe; PcR: C-reactive protein; PCR: polymerase chain reaction; PCT: procalcitonin; IQR: interquartile range; RSV: respiratory syncytial virus.

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amplification techniques were performed which are approved to be carried out on vaginal, endocervical, urine and urethral samples. In our population the results came from nasopharyngeal samples, whose use is not validated by the FDA, but whose result, interpreted together with the patient's clinical picture and, when possible, with the serological results, would allow for the establishment of the aetiological diagnosis of the infection.

Although we present a limited number of patients, it is useful to highlight the characteristics of this entity, which is potentially serious, and which must be one of the main diagnostic suspicions in infants admitted with lower respiratory tract infections, where microbiological isolation from other species is not obtained and they present with eosinophilia, as well as compatible epidemiological factors.

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Role of *Staphylococcus caprae* in nosocomial infection☆

Papel del Staphylococcus caprae *en la infección nosocomial*

Staphylococcus caprae (S. caprae) is a gram-positive coagulase-negative, catalase-positive coccus, which was first described in 1958 as a skin and mammary glands coloniser in goats.[1] It is considered a saprophytic flora that usually resides on the skin, nails and nasal mucosa.[2] However, since the first case was described in 1983, its pathogenic role has been considered the cause of infections in different locations —peritonitis, meningitis, urinary tract infections, endocarditis, endophthalmitis, prosthetic joint infections, recurrent sepsis, bacteraemia, and osteomyelitis—. Risk factors include immunosuppressed states, obesity, traumatic or open fractures and especially contact with sheep or goats.[3]

As far as we can tell, the vast majority of cases are infections that settle on orthopaedic devices. The nosocomial origin of the infection, although difficult to prove, has been described within neonatal intensive care units, central line associated bacteraemia and after orthopaedic surgery.

Molecular techniques and matrix assisted laser desorption ionisation-time of flight mass spectrometry (MALDI-TOF MS) have led to an improvement in the identification of clinically relevant strains of *S. caprae*.[4]

In the last 10 years we have had the opportunity to attend to 13 cases of infections due to *S. caprae* (Table 1). Their mean age was 69 years (SD 12.9) with a clear male predominance (91%).

The most common location was in the lower limbs (77%), followed by central line catheter associated bacteraemia (15%) and vertebral involvement (8%). Bone and/or joint involvement was observed in 54% with orthopaedic prosthetic material involvement of 31%, finally resolving in all cases.

At diagnosis, 46% had immunosuppressed states, and of all of those 67% had type 2 diabetes mellitus, 50% chronic kidney disease and 33% pharmacological immunosuppression secondary to corticosteroid consumption. The Charlson Index was greater than 5 points in 61% of cases.

In 54% of the cases the infection turned out to be polymicrobial with a predominance of association with cocci and gram-positive bacilli, while in the remaining 46% it was monomicrobial. Regarding antibiotic sensitivity only 8% showed resistance to fluoroquinolones and 23% to penicillins. Patients were mainly treated with beta-lactams (46%) and fluoroquinolones(31%); to a lesser extent, the use of glycopeptides (8%) and oxazolidinones (15%) was observed. Antibiotics were maintained for a mean of 29 days, excluding the case of joint involvement due to transfer of the patient to the reference centre. In 31% of the patients sequential therapy was possible, thus making treatment on an outpatient basis possible. In 92% of cases it presented as a nosocomial infection. No case of death was documented during the infectious process or 30 days after medical discharge.

S. caprae has been described as a potential pathogen with special voracity for orthopaedic devices in immunocompromised hosts.[4] However, in our series we did not observe differences regarding

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