

CASE REPORT

Slow-resolving pneumonia, case report

Neumonía de lenta resolución, reporte de un caso

Lázaro Noel Pérez Lazo¹  , Darilys Pita Perez¹, Mayda Nemecia Valido García¹

¹Universidad de Ciencias Médicas de Pinar del Río. Hospital Pediátrico Provincial Docente “Pepe Portilla”. Pinar del Río, Cuba.

Cite as: Pérez Lazo LN, Pita Perez D, Valido García MN. Slow-resolving pneumonia, case report. AG Salud. 2024; 2:61. <https://doi.org/10.62486/agsalud202461>

Submitted: 27-09-2023

Revised: 20-01-2024

Accepted: 18-03-2024

Published: 19-03-2024

Editor: Javier Gonzalez-Argote 

ABSTRACT

Respiratory infections are one of the main causes of consultation and hospitalization in primary health care, including pneumonia. We present the case of a 3-year-old preschooler who came to the health services for presenting frequent wet cough and fever of up to 39 degrees Celsius of 8 days of evolution, who was previously treated with oral Amoxicillin in his health area without resolution of the symptoms. On physical examination, the patient was found to be in good general condition, where only the presence of crackling rales in the right lung base was positive; antimicrobial therapy was started, showing clinical improvement and cessation of the febrile symptoms. On the fifth day of evolution the febrile symptoms reappeared with peaks of up to 39 degrees Celsius. Physical and radiological examination showed worsening of the symptoms. Results of nasopharyngeal exudate were received, which showed *Klebsiella pneumophila*. An evolutionary chest X-ray was indicated, resulting in a denser and more homogeneous opacity with radiolucent areolar images towards its upper contour that kept occupied upper and middle segments of the right lung field, showing a phase of hepatization of the process with images suggestive of pneumatoceles. Antimicrobial spectrum was extended with Meropenem associated to Vancomycin according to antibiogram and possible sensitivity according to the most frequent etiology according to age, with satisfactory resolution of the picture. Atypical etiologies, including *Klebsiella pneumophila*, should be suspected in the case of slowly resolving pneumonia.

Keywords: Pneumonia; *Klebsiella*; Respiratory System Infections; Primary Health Care; Referral and Consultation.

RESUMEN

Las infecciones respiratorias constituyen una de las principales causas de consulta y hospitalización en la atención primaria de salud, entre ellas la neumonía. Se presenta el caso de un pre-escolar de 3 años de edad, que acude a los servicios de salud por presentar tos húmeda frecuente y fiebre de hasta 39 grados de 8 días de evolución, que llevó tratamiento previo con Amoxicilina oral en su área de salud sin resolución del cuadro. Al examen físico se encontró un paciente con buen estado general, donde solo resultó positivo la presencia de estertores crepitantes en base pulmonar derecha; se inicia terapia antimicrobiana exhibiendo mejoría clínica y cese del cuadro febril. Al quinto día de evolución reaparece el cuadro febril con picos de hasta 39 grados. Se encuentra al examen físico y radiológico empeoramiento del cuadro. Se recibió resultado de exudado nasofaríngeo, el cual mostró *Klebsiella Pneumófila*. Se indica radiografía de tórax evolutiva, resultando en una opacidad más densa y homogénea con imágenes areolares radiotransparentes hacia su contorno superior. Meropenem asociado a Vancomicina de acuerdo a antibiograma y posible sensibilidad de acuerdo a la etiología más frecuente según la edad, con resolución satisfactoria del cuadro fue usado. Ante una neumonía de lenta resolución debe sospecharse etiologías atípicas, entre ellas la *Klebsiella Pneumófila*.

Palabras clave: Neumonía; Klebsiella; Infecciones del Sistema Respiratorio; Atención Primaria de Salud; Derivación y Consulta.

INTRODUCTION

Pneumonia is a lower airway infection that causes acute inflammatory injury to the lung parenchyma in response to the arrival of the microorganism in the distal airway.⁽¹⁾ Pneumonia is the leading cause of infant mortality in the world.

Pneumonia is the leading cause of infant mortality in the world, causing the death of a child under five years of age every 15 seconds, i.e., two million every year. Pneumonia accounts for 20 % of the nearly nine million children under five years of age who die each year. In developed countries it accounts for only 3 % of infant mortality, but in developing countries it represents 19 %.⁽²⁾

The physiology and pathology of community-acquired pneumonia are due to the etiological agent, pathogens such as *Streptococcus pneumoniae*, *Haemophilus influenzae*, and gram-negative bacteria, most of which enter the organism through the lower respiratory tract, and intracellular bacteria (*Mycoplasma* et al.) and viruses through the inhalation route.⁽³⁾

The spectrum of clinical presentation and causative agents of the entity under study is very broad; it is a frequent reason for consultation in emergency departments, represents a significant burden of care and high consumption of resources, aspects that point to the precision of those contents that are essential for the management of the same.⁽⁴⁾

CASE REPORT

The patient is a 3-year-old preschooler, the product of a euthyroid delivery at 39 weeks, with no health history, exclusively breastfed until 6 months of age. She came to the health services for presenting frequent wet cough and fever of up to 39 degrees of up to 8 days of evolution, which had been previously treated with oral Amoxicillin in her health area without resolution of the symptoms.

On physical examination, the patient was found to be in good general condition, where only the presence of crepitant rales in the right lung base was positive. An anteroposterior chest X-ray was indicated, which showed heterogeneous opacity involving upper and middle segments of the right lung field with opaque and radiolucent airways and acute right middle cysuritis of bronchopneumonic inflammatory aspect with pleural involvement (figure 1). Ultrasound of the lung bases showed a right pleural reaction with hepatization of the lung parenchyma and echo-refrangent images due to air bronchogram.

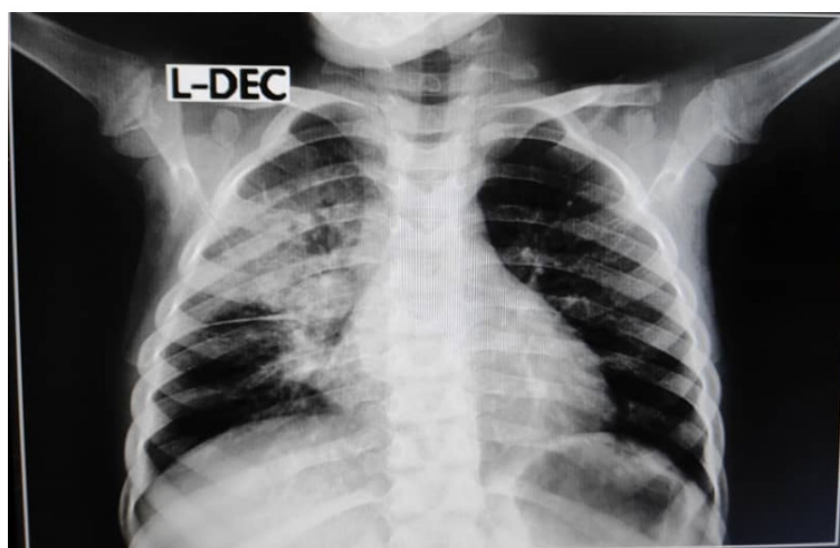


Figure 1. Heterogeneous opacity involving upper and middle segments of the CPD with opaque and radiolucent airways and acute right middle cysuritis, of bronchopneumonic inflammatory aspect with pleural involvement

A hemoglobin of 11,0 g/L, hematocrit of 0,34 l/L, and erythrocyte sedimentation rate of 74 mm/h were indicated.

Antimicrobial therapy with Cefoperazone/Sulbactam (100 mg) was started, showing clinical improvement and cessation of febrile symptoms. On the fifth day of evolution, the febrile symptoms reappeared, peaking at

up to 39 degrees Celsius. Physical examination revealed a reddened oropharynx with the presence of exudates in the tonsils and posterior pharyngeal wall.

It was decided to perform a nasopharyngeal exudate. An evolutionary chest X-ray was indicated according to the follow-up protocol (figure 2), finding radiological worsening, with greater cellularity and central airways with a rounded tendency with air content (due to air trapping). Bronchopneumonia inflammatory aspect in evolution.



Figure 2. Chest X-ray evolution

The case was reevaluated due to the persistence of the clinical picture with fever and catarrhal manifestations. Sepsis profile was performed with positive acute phase reactants (erythrocyte sedimentation rate: 90mm/h). After analyzing the clinical and radiological worsening, it was decided to change the antimicrobial agent to Ceftriaxone (100 mg) according to the protocol.

Seventy-two hours later, the patient was reevaluated, showing improvement of the catarrhal symptoms, although fever persisted. A blood culture was indicated, which was negative, and a nasopharyngeal exudate result was received, which showed *Klebsiella pneumoniae*. An evolving chest X-ray was indicated, resulting in a denser and more homogeneous opacity with radiolucent areolar images towards its upper contour that keeps occupied upper and middle segments of the right lung field, impressing in the hepatization phase of the process with images suggestive of pneumatoceles that in this examination are more organized, compatible with bronchopneumonia inflammatory process of slow resolution (figure 3).

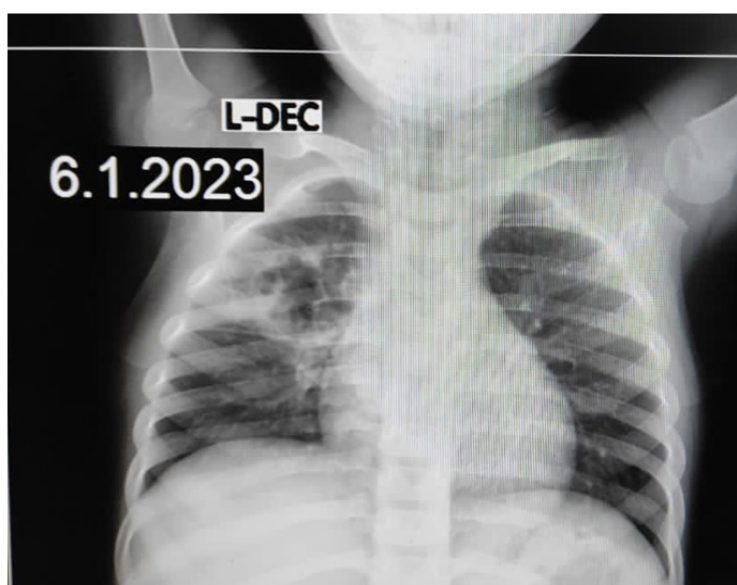


Figure 3. X-ray compatible with bronchopneumonic inflammatory process of slow resolution

The antimicrobial spectrum was extended with Meropenem associated with Vancomycin according to the antibiogram and possible sensitivity according to the most frequent etiology according to age, with a satisfactory resolution of the picture.

DISCUSSION

If the clinical picture persists, with recurrence and persistence of fever, and an unfavorable evolution of the radiological picture, as well as the appearance of a new septic focus even with broad-spectrum antibiotic therapy now with isolated germ in nasopharyngeal exudate and the presence of acute phase reactants now with higher figures, the presence of *Klebsiella pneumoniae* should be suspected.⁽⁵⁾

Klebsiella pneumoniae is a rare and severe disease with abrupt onset, fever, pleuritic pain, cough with dark brown or red jelly sputum, dyspnea, abundant purulent expectoration, and may have hemoptysis. Complications may occur: pleural empyema or pulmonary abscess, which may lead to sepsis and high mortality (30-35 %), especially in cases with bacteremia. It is frequent in people with diabetes mellitus and high alcohol consumption.

Klebsiella is an important gram-negative pathogen belonging to the enterobacteria, which is involved in a variety of nosocomial infections such as pneumonia, bloodstream infections, skin/soft tissue, etc. In addition, it can acquire resistance mechanisms to different groups of antimicrobials.⁽⁶⁾

The leukogram is one of the most commonly used complementary tests in the researcher's routine. A study by Labrador-Bernal et al.⁽⁷⁾ showed that in children under 18 years of age with pneumonia, leukocytosis and lymphocytosis were common findings. The study suggests that the correct interpretation of the leukogram and a clear vision of its importance for the diagnostic process are key elements that guarantee a level of health care with the quality required to achieve adequate care.

Slow-resolving pneumonia is considered when the disappearance of the radiological infiltrate or the recovery of clinical symptoms is prolonged despite adequate antibiotic treatment.

The patient's evolution was positive, and a resolution was achieved. However, some authors have reported the presence of complications, such as meningitis, which is associated with high mortality and requires more complete therapeutic approaches to improve the clinical prognosis.⁽⁸⁾

Similarly, in patients with deficient immunological states, such as diabetes mellitus, cases of liver abscesses have been observed, which have a negative prognosis, especially in pediatric patients.⁽⁹⁾

REFERENCES

1. Baños YG, Almarales OOT, Avila HR. Descripción de la neumonía asociada a la ventilación mecánica. *Salud Cienc Tecnol - Ser Conf.* 26 de octubre de 2023;2:604.
2. D Dopico-Ravelo, A Rodríguez-González, N Hernández-Suárez, L Junco-Labrador, M Cuello-Carballo. Hemocultivo como medio para establecer el mapa microbiológico en la neumonía adquirida en la comunidad. *Rev Cienc Médicas Pinar Río.* 2022;26(6):5360.
3. Li Y, Kumar S, Zhang L, Wu H. *Klebsiella pneumoniae* and Its Antibiotic Resistance: A Bibliometric Analysis. *BioMed Res Int.* 6 de junio de 2022;2022:e1668789.
4. Suárez NH, Gonzalez BF, Alemán RL, Batista IIT, Sánchez MS, Miranda AG. Regularidades de superación profesional sobre Neumonía Adquirida en la Comunidad para docentes de Medicina Interna. *Salud Cienc Tecnol - Ser Conf.* 11 de diciembre de 2022;1:297.
5. Patil S, Pai L, Chen X, Francisco NM, Chen H, Chen Y, et al. Genomic characterisation of multi-drug resistant *Escherichia coli* and *Klebsiella pneumoniae* co-harboring *mcr-1* and *mcr-3* genes on a single plasmid from paediatric clinical cases. *J Glob Antimicrob Resist.* 1 de septiembre de 2023;34:134-40.
6. Catañeda D de la CG, Gutiérrez YH. *Klebsiella pneumoniae* Metalobetalactamasa en servicio de neonatología del Hospital Abel Santamaría: reporte de caso. *Salud Cienc Tecnol - Ser Conf.* 2023;2:508.
7. Labrador-Bernal R, Valido-Valdes D, Díaz MCC, Prieto AF, Ordaz-Peña E. Valor del leucograma en la orientación del diagnóstico etiológico y la evolución clínica de niños hospitalizados por neumonía. *Salud Cienc Tecnol - Ser Conf.* 10 de diciembre de 2023;2:502.
8. Huang X, Han M, Jin F, Zhu Z, Zhang H. Analysis of a Refractory Case of Pediatric Meningitis Caused by *Klebsiella pneumoniae* Co-Resistant to Carbapenems and Polymyxins. *Infect Drug Resist.* 2022;15:5309-13.

9. Li Y, Li Z, Qian S, Dong F, Wang Q, Zhang P, et al. A fatal case of liver abscess caused by hypervirulent *Klebsiella pneumoniae* in a diabetic adolescent: A clinical and laboratory study. *Pediatr Investig*. 2021;5(2):118-24.

FINANCING

This study is self-financed.

CONFLICT OF INTEREST

The authors report no conflicts of interest.

AUTHORSHIP CONTRIBUTION

Conceptualization: Lázaro Noel Pérez Lazo, Darilys Pita Perez, Mayda Nemecia Valido García.

Research: Lázaro Noel Pérez Lazo, Darilys Pita Perez, Mayda Nemecia Valido García.

Writing - original draft: Lázaro Noel Pérez Lazo, Darilys Pita Perez, Mayda Nemecia Valido García.

Writing - proofreading and editing: Lázaro Noel Pérez Lazo, Darilys Pita Perez, Mayda Nemecia Valido García.