Mycoplasma resurgence: 2 years case series of *Mycoplasma pneumoniae* characteristics in children with Down Syndrome

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BACKGROUND

Individuals with Down syndrome (DS) experience a significantly disproportionate burden of respiratory morbidity, with an increased incidence of all-cause pneumonia compared to the general population and remains the leading cause of hospital admissions in children and a primary driver of mortality in adults with DS. [1,2]

Despite this known vulnerability, there is a marked scarcity of evidence specifically characterizing the clinical manifestations and outcomes of severe *Mycoplasma pneumoniae* in the DS population. [3]

Following COVID-19 pandemic, the world is currently witnessing a global resurgence of *M. pneumoniae*. [4, 5]

OBJECTIVE

Characterize the clinical manifestations and outcomes of patients with DS hospitalized for severe *M. pneumoniae* community-acquired pneumonia (CAP) during the current global resurgence. By analyzing a 2-year case series, we aim to bridge the existing gap in evidence regarding how this pathogen specifically impacts DS population.

METHODS

Design: A 2-year retrospective, descriptive, and analytical study spanning from 2024 to 2025.

Inclusion Criteria: Pediatric patients (0 to 18 years old) with a genetic or clinical diagnosis of DS, hospitalized with a primary diagnosis of CAP.

Exclusion Criteria: Patients admitted for any other cause who subsequently developed ventilator-associated pneumonia or healthcare-associated pneumonia.

Statistical Analysis: Conducted using RStudio. Chi-square tests were utilized for categorical variables, one-way ANOVA for comparing means of analytical parameters, and ROC curves to evaluate the predictive capacity (AUC and optimal cut-off points) of significant biomarkers.

RESULTS

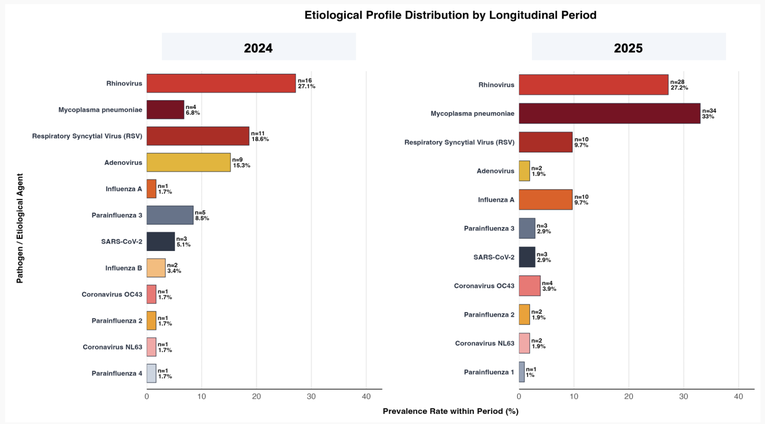

Figure 1: Etiological distribution

The mean age was 4.27±4.12 years, with a predominance in the 1-to-2-year-old age group (53%, n=88). Of the sample. Patent Ductus Arteriosus (PDA 53%) and Atrial Septal Defect (ASD/CIA, 38.6%) were the most prevalent specific defects. Thyroid alterations were documented in 44.6% (n=74) of patients. The overall mean length of hospital stay was 12.4±9.1 days. A subset of 13.9% (n=23) required admission to the Pediatric Intensive Care Unit (PICU), with a mean PICU stay of 50.67±11.94 days. (Table 2)

A total of N=166 patients were analyzed. The most frequently identified pathogens overall were Rhinovirus and *Mycoplasma pneumoniae*. A marked percentage increase in *M. pneumoniae* was observed between the 2024 period (6.8%) and the 2025 period (33%). (Figure 1)

General Patient Parameter	Frequency (n) / Proportion (%)
Age (years), Mean (± SD)	4.27 (± 4.12)
– 1 to 2 years old group (%)	53.0% (n = 88)
Sex: Male (%)	56.0% (n = 93)
Sex: Female (%)	44.0% (n = 73)
Congenital Heart Disease (CHD) (%)	86.6% (n = 142)
Thyroid Alteration (%)	44.6% (n = 74)
Non-Invasive / High-Flow Ventilation (%)	56.0% (n = 93)
Invasive Mechanical Ventilation (IMV) (%)	19.9% (n = 33)
Pediatric Intensive Care Unit (PICU) (%)	13.9% (n = 23)
Intermediate Care Unit (%)	15.1% (n = 25)
Length of Hospital Stay (Days), Mean (± SD)	12.4 (± 9.1)
Days of ICU Length of Stay, Mean (± SD)	50.67 (± 11.94)

Table 1: Demographic Characteristics and comorbidities

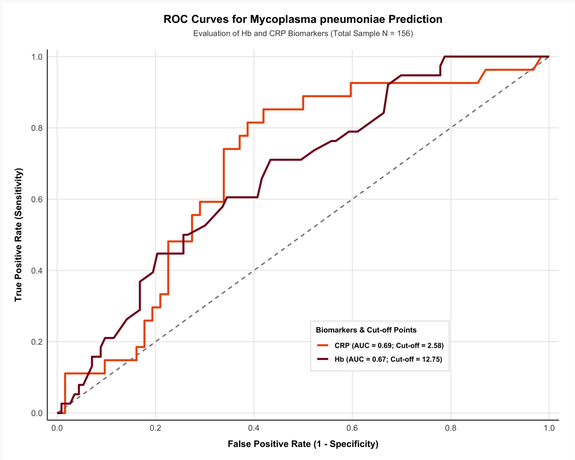

Figure 2: Biological markers ROC curve

A history of symptomatic contact (p=0.011), hyporexia (p=0.016), respiratory distress (p=0.020), and an active cough (p=0.042) but no statistically significant differences were found when stratifying congenital heart disease, thyroid alterations, or the requirement for mechanical ventilation (invasive or non-invasive) between the *M. pneumoniae*-positive and *M. pneumoniae*-negative groups (p>0.05).

SpO2 showed a highly significant difference (p<0.001), establishing an optimal cut-off point of 66.0% to identify severe compromise. C-Reactive Protein (CRP) demonstrated an Area Under the Curve (AUC = 0.69) with an optimal clinical cut-off point of 2.58 mg/dL. Hemoglobin (Hb) displayed significance in the variance analysis (p=0.009) and an AUC = 0.67 with an optimal cut-off of 11.2 g/dL (12.75 g/dL in the secondary ROC analysis). (Figure 2)

CONCLUSIONS

Mycoplasma pneumoniae has emerged as a critical bacterial pathogen in our setting, significantly associated with presentations involving an active cough, hyporexia, and a history of symptomatic contact.

The combination of readily accessible biomarkers such as SpO2 CRP, Hemoglobin, and the Free/Total T3 profile provides valuable quantitative tools modeled to assess systemic compromise and guide early diagnostic suspicion in the hospital setting.

Furthermore, a comparative analysis will be conducted against the general pediatric population hospitalized with severe *Mycoplasma* CAP to identify distinct syndromic patterns and specific vulnerabilities associated with Down syndrome.

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