

Assessment of *Streptococcus Pneumoniae* as Cause of Acute Otitis Media in Young Children in Colombia: A prospective study



Coronell-Rodriguez W¹, Alvarado-Gonzalez JC^{2,3}, Camerano R², Puerto A², Zakzuk J^{1,2}, Alvis-Zakzuk NR^{2,7}, Moyano-Tamara L², Medina S⁴, Beltran C⁴, Betancur M⁴, Rojas M⁴, Farias LE⁴, Pinzon Redondo H^{1,3}, Villamor P³, Osorio S^{1,3,5}, Alvis-Guzmán N^{2,6}

1. Universidad de Cartagena, Cartagena, Colombia; 2. ALZAK, Cartagena, Colombia; 3 Hospital Infantil Napoleón Franco Pareja, Cartagena, Colombia; 4. MSD, Bogotá, Colombia; 5. Hospital Serena del Mar, Cartagena, Colombia; 6. Universidad de la Costa, Barranquilla, Colombia; 7. Institución Universitaria Mayor de Cartagena, Cartagena, Colombia.

OBJECTIVES

Since the introduction of PCV-10 in 2011 there is a lack of evidence about its impact on acute otitis media (AOM) in children under five years in Colombia. We aimed to describe the clinical and sociodemographic characteristics of patients from 3 to 59 months old with diagnosis of AOM whom attended to a third-level health institution from Cartagena, Colombia. We estimated the prevalence of AOM caused by *S. pneumoniae*, the serotype distribution and antimicrobial resistance patterns.

METHODS

A prospective cohort study was conducted during 12 months from August 5th, 2022, to August 5th, 2023. Diagnosis of AOM was confirmed by an otorhinolaryngologist. Middle ear fluid (MEF) samples were collected using a swab or by tympanocentesis depending on if spontaneous drainage was present. Samples with a positive culture for *S. pneumoniae* were sent to the National Health Institute for serotyping.

RESULTS

A total of 61 patients were enrolled. Sixty of them were collected by ear swabbing and 1 via tympanocentesis. 57.4% were male, the median age was 12 months. Six cases of *S. pneumoniae* were identified, median age was 26.5 months, none had any comorbidities, only one presents previous episodes of AOM. Five of these were vaccinated (**Table 1**).

RESULTS

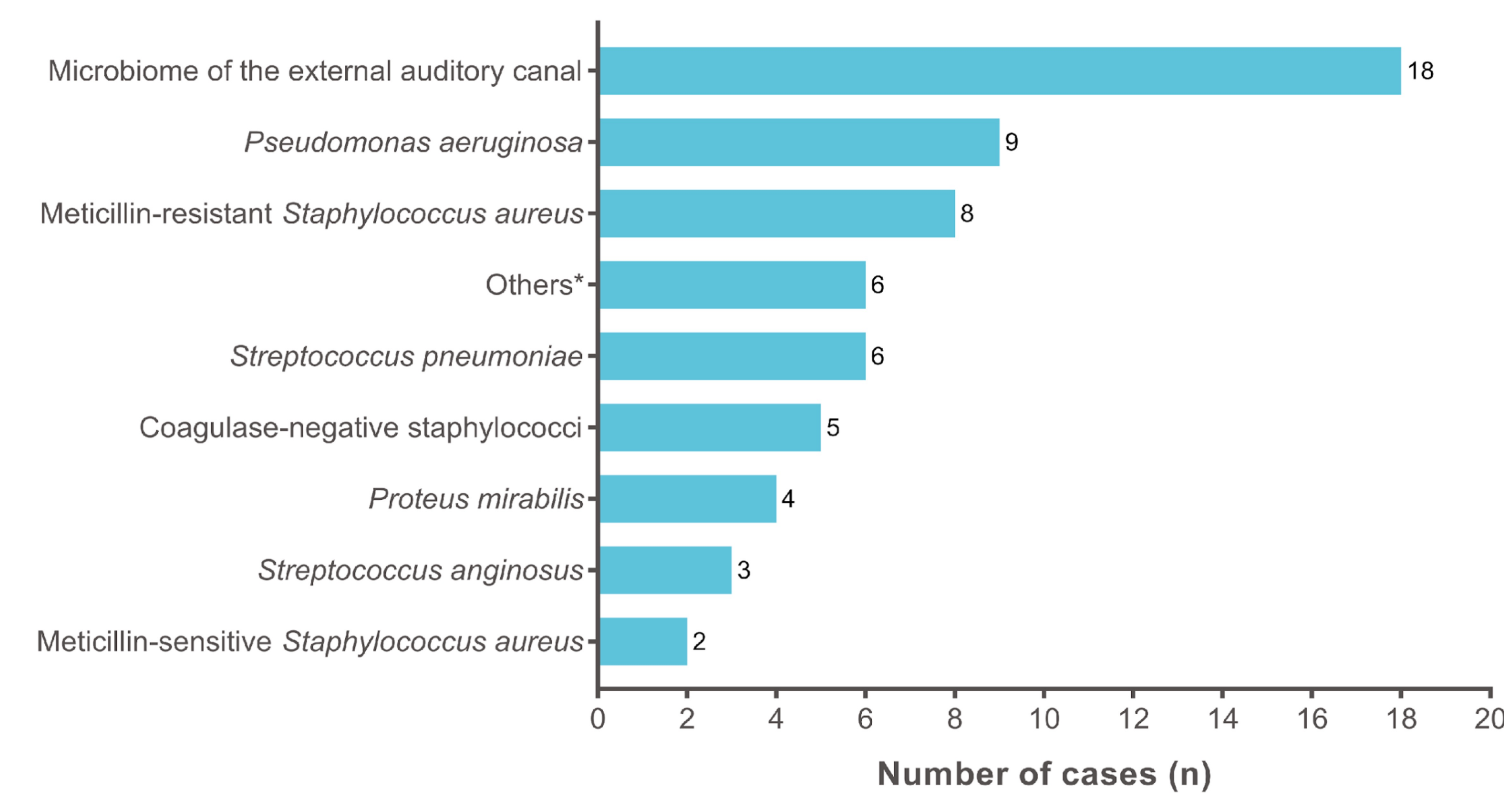
Table 1. Sociodemographic and clinical characteristics of patients with AOM.

Variable	Total patients recruited n = 61		Patients with AOM, with microorganisms other than <i>S. pneumoniae</i> n = 55		Patients with <i>S. pneumoniae</i> n = 6	
	N	%	n	%	n	%
Sex						
Female	26	42.6	22	40	4	67
Male	35	57.4	33	60	2	33
Age in months (median)	12.0 IQR [8.0 - 24.0]		12.0 IQR [7.0 – 24.0]		26.5 IQR [8 – 45]	
Previous episodes of AOM						
0	55	90.2	50	90.9	5	83.3
1	4	6.6	3	5.5	1	16.7
2	1	1.6	1	1.7	-	-
> 3	1	1.6	1	1.8	-	-
Comorbidities						
Yes	2	3.3	2	3.6	-	
No	59	96.7	53	96.4	6	100
Pneumococcal vaccination						
Yes	58	95.1	53	96.4	5	83
No	3	4.9	2	3.6	1	17
No. vaccine dose*						
1	4	6.9	4	7.5	0	
2	33	56.9	31	58.5	2	40
Booster dose	21	36.2	18	3.4	3	60

*Proportion calculated from the total number of vaccinated patients.

Most frequent isolates were *P. aeruginosa* (14.8%), *Methicillin-resistant S. aureus* (13.1%) and *S. pneumoniae* (9,8%) (**Figure 1**). The presence of spontaneous ear fluid drainage and the subsequent infrequent application of tympanocentesis were significant limitations that are reflected in the results observed. The serotypes distribution was 19A 4 (67%), 10F and 35A (17%) each; the six isolates showed antimicrobial resistance, with 19A being multidrug-resistant to beta-lactam, macrolides, lincosamides and TMP/SMX.

Figure 1. Report of microorganisms from the MEF culture, N=61



*Other isolated microorganisms: *Streptococcus Salivarius*, *Streptococcus group A*, *Micrococcus*, *Enterococcus faecium*, *Escherichia coli* and Gram positive non-sporulated bacillus of contaminating type.

CONCLUSIONS

S. pneumoniae remains a leading cause of AOM, even though its incidence has decreased over time, particularly for cases linked to the PCV-10 vaccine serotypes. Serotype 19A accounts for 67% of these infections and exhibits a multidrug-resistant pattern, like the behavior observed in invasive pneumococcal diseases. Future studies will be needed to track AOM trend after PCV13 introduction.

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