

Analysis of False-Positive Urinary Pneumococcal Antigen Results at a Secondary Care Hospital in Japan

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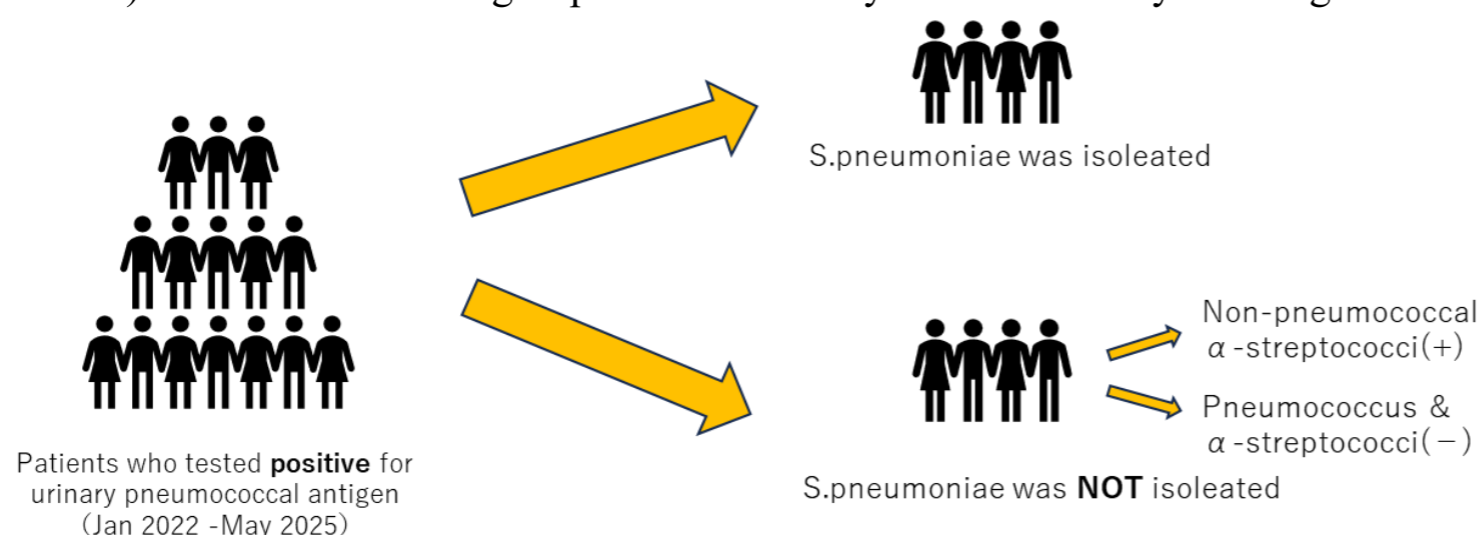
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Introduction

Streptococcus pneumoniae remains a leading cause of community-acquired pneumonia. Urinary antigen testing is widely used due to its rapid, non-invasive nature. However, false positives may result from cross-reactivity or colonization. We aimed to assess false-positive results in urinary pneumococcal antigen testing.

Materials & Methods

This retrospective study was conducted at a secondary-care hospital in Shizuoka, Japan, between Jan 2022 and May 2025. Patients who tested positive for urinary pneumococcal antigen were categorized into an 'isolated' group (those with *S. pneumoniae* isolated from sputum, urine, or blood cultures) and a 'non-isolated' group. Cross-reactivity was assessed by isolating α -hemolytic streptococci.



The following variables were analyzed:

- False-positive rate
- Bacteria detected in pneumococcus-negative cases
- Comparison between isolated and non-isolated groups

Results

Of 60 urinary antigen-positive patients, 15 were in the Isolated group: all had *S. pneumoniae* from sputum (14 Geckler 3–5, 1 Geckler 1–2/6), and two had positive blood cultures. In the non-isolated group, α -hemolytic streptococci were isolated from good-quality sputum in 16 cases and from poor-quality sputum in 21 cases; in 8 cases neither pathogen was detected.

Table 1: Detection Rates of Causative Bacteria by Sputum Quality

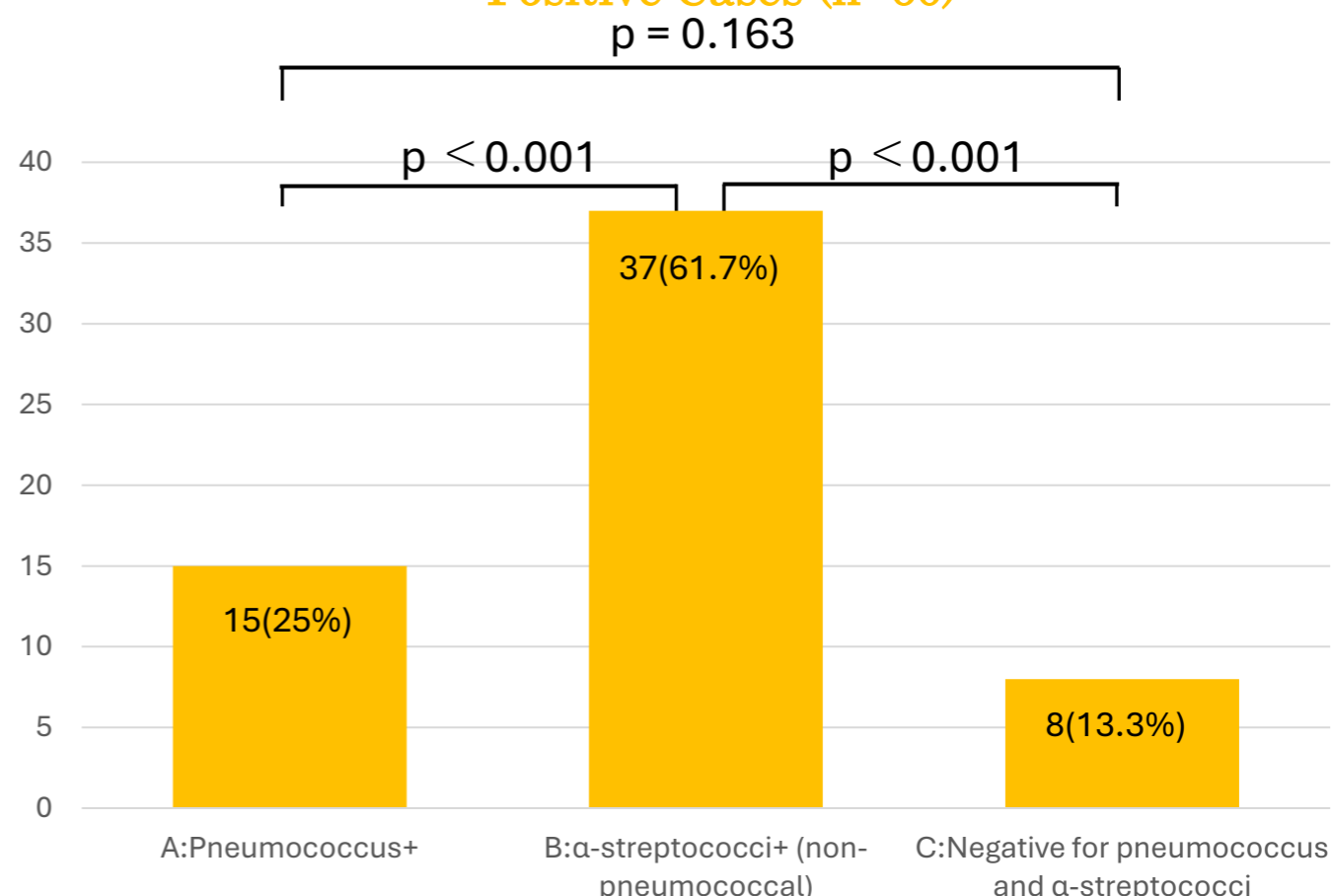
Group	Sputum	Case	Rate
Pneumococcus+	Geckler 3-5	14	23.3%
	Geckler 1.2.6	1	1.7%
α -streptococci+ (non-pneumococcal)	Geckler 3-5	16	26.7%
	Geckler 1.2.6	21	35%
Negative for pneumococcus and α -streptococci	Geckler 3-5	3	5%
	Geckler 1.2.6	0	0%

* five cases, no sputum, urine, or blood specimens were submitted.

Table 2: List of bacteria detected in non-isolated group other than α -hemolytic streptococci

Bacteria	Cases(n)	
	Geckler 3-5	Geckler 1.2.6
<i>Neisseria</i>	9	10
<i>Corynebacterium</i>	3	2
<i>Hemophilus influenzae</i>	0	3
MSSA	1	2
<i>Candida sp.</i>	1	2
<i>E. coli</i>	2	0
<i>Pseudomonas aeruginosa</i>	2	2
<i>Serratia marcescens</i>	0	2

Figure 1: Distribution of Pneumococcal Urinary Antigen Positive Cases (n=60)



- The false-positive rate among pneumococcal antigen-positive cases was 75%.
- In 82% of the false-positive cases, α -hemolytic streptococci, known to cause cross-reactions, were detected.
- From figure 1, a significant difference was observed among the three groups, with 61.7% of cases classified as B, in which pneumococcus was not isolated but α -hemolytic streptococci were detected. This supports that most positive results are attributable to cross-reactions with α -hemolytic streptococci rather than true pneumococcal infection.
- *Neisseria*, an oral commensal, indicating that most false positives were attributable to cross-reactions with oral commensal bacteria, was most frequently detected with the viridans group.

Conclusion

Seventy-five percent of urinary pneumococcal antigen tests were false positives, mainly due to cross-reactivity with oral commensals (α -hemolytic streptococci). For clinical application, test results should be interpreted in conjunction with culture findings and clinical assessment.