

ABSTRACT

Background: Pneumonia is a major health problem and is associated with high morbidity and mortality. Microbiology examination is very important to identify the etiology and guide the selection of antimicrobials. There is no uniformity of sputum examination methods in identifying the etiology of pneumonia.

Objective: Proving the correlation between microscopic examination results and semi-quantitative sputum culture results with quantitative sputum culture results in identifying the etiology of pneumonia.

Methods: Prospective observational analytic study design. A total of 46 sputum samples were subjected to microscopic examination, semi-quantitative culture, and quantitative culture. Furthermore, analysis of Spearman's correlation test and Kappa agreement test was carried out between microscopic bacterial count and semi-quantitative culture results against quantitative culture results.

Results: Correlation test results of microscopic bacterial count with quantitative sputum culture results showed a strong correlation ($r = 0.677$, $p < 0.001$), but the level of agreement in determining the cause of infection and colonization was categorized as moderate ($\kappa = 0.469$). The correlation between semi-quantitative and quantitative culture results was very strong ($r = 0.817$, $p < 0.001$) with a good level of agreement between the two methods ($\kappa = 0.723$).

Conclusion: Gram stain of good quality sputum can be used as a preliminary test and as a complement to sputum culture to facilitate the interpretation of sputum culture results. The two sputum culture methods are comparable and can be substituted for each other. The use of the selected culture method depends on the ability of the staff and the resources available in the laboratory.

Keywords: pneumonia, sputum microscopic examination, semi-quantitative sputum culture, quantitative sputum culture