Evaluation of sodium hydroxide–N-acetyl-L-cysteine and 0.7% chlorhexidine decontamination methods for recovering Mycobacterium tuberculosis from sputum samples: A comparative analysis (The Gambia Experience)

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ABSTRACT

Objective/Background: To determine the culture yield and time to detection of mycobacterial growth between samples decontaminated using 0.7% chlorhexidine and sodium hydroxide–N-acetyl-L-cysteine (NaOH–NALC) and cultured on the Löwenstein–Jensen (LJ) medium. We also aimed to determine the contamination rate between the 0.7% chlorhexidine and NaOH–NALC decontamination methods.

Methods: The study was carried out on 68 sputa samples (42 smear positives and 26 smear negatives). Of these 68 samples, 46 were collected from men and 26 from women with an approximate average age of 27 years. All the sputum samples were decontaminated using the standard NaOH–NALC and 0.7% chlorhexidine methods. The concentrates were cultured in parallel on LJ media in which reading of the slope for mycobacterial growth was obtained daily for the first 2 weeks and then weekly until week 8. The mycobacterial recovery rate, time to detection, and contamination rate were then compared.

Results: The overall recovery rate of mycobacterial growth on samples treated with both decontamination methods inoculated on LJ media is 51.5% (35/68). Specifically, mycobacterial growth rates on samples treated with 0.7% chlorhexidine and standard NaOH–NALC on LJ media were 61.8% (42/68) and 54.4% (37/68), respectively. However, the growth of Mycobacterium tuberculosis complex was faster on samples treated with 0.7% chlorhexidine than those treated with NaOH–NALC (average, 32 ± 5 days vs. 33 ± 5.2 days, respectively). The contamination rate on samples treated with 0.7% chlorhexidine was 1.5% (1/68), whereas on those treated with NaOH–NALC, the rate was 4.4% (3/68).

Conclusion: The 0.7% chlorhexidine decontamination method is rapid and has less contamination rate in terms of mycobacterial recovery compared with the standard NaOH–NALC method. Therefore, the 0.7% chlorhexidine decontamination method would be an ideal alternative option for decontamination of sputum samples and recovery/isolation of M. tuberculosis in resource-poor countries.

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Conflicts of interest

The authors have no conflicts of interest to declare.