Comparison of Sheep Blood and Human Blood Based Media for the Isolation and Identification of Pneumococcal Strains

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Although, the conventional culture using sheep blood supplementation is recommended for the identification of *Streptococcus pneumoniae*, developing countries use human blood as an alternative. Therefore, it is important to evaluate the impact of two different blood media on pneumococci isolation and identification. Twenty different strains of *S.pneumoniae* [four strains each from the five commonest serotypes found in Sri Lanka (19F, 6B, 6A, 14 and 23F)] and *S.pneumoniae* ATCC 45619 were used in this study. Proportions of colonies ≥ 1 mm, colony counts (in 0.5 McFarland, 10^{-1}, 10^{-2}, 10^{-3}, 10^{-4} dilutions) in HBA and SBA were compared. ABST (on blood-MHA), and MIC (in blood-MHB) were compared between two blood types. All the isolates demonstrated alpha hemolysis and Draughtsman appearance on sheep blood agar (SBA) but not on human blood agar (HBA). Considering all isolates together, the mean number of colonies ≥ 1 mm was 8 (±9) on HBA and 23 (±10) on SBA. In higher dilutions (10^{-3}, 10^{-4}), mean number of colonies on SBA ($1.94x10^5$, $5.36x10^4$ CFU/ml) was higher than HBA ($1.78x10^5$, $4.18x10^4$ CFU/ml). Mean ABST zone diameters of tetracycline, erythromycin, levofloxacin on human blood-MHA were 24.5, 17.5, 25.2 mm and on sheep blood-MHA were 21.2, 12.7, and 23.5 mm. MIC50 and MIC90 for penicillin were similar in both media (2 and 4 µg/ml). MIC50, MIC90 for cefotaxime in human blood-MHB was 0.5 and 2µg/ml; in sheep blood-MHB was 0.75 and 2 µg/ml. Since the typical colony characteristics were not seen, there is a possibility to misidentify pneumococci on HBA. Isolation of pneumococci on HBA is less when organisms are present in lower concentrations. Larger ABST zones on human blood-MHA may alter sensitivity interpretation. Therefore, Human blood cannot be recommended for the isolation and identification of *S.pneumoniae* and this may contribute to the under-diagnosis and improper treatment of pneumococcal infections.

Keywords: *Streptococcus Pneumoniae*, Sheep Blood Agar, Human Blood Agar, Isolation and Identification