Comparison of Four Media for the Detection of Group A Streptococcus from Throat Specimens

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Background: Culture is used commonly for the diagnosis of Group A beta-hemolytic streptococcus (GAS) infections. This study examined medium type and length of incubation for optimal and cost-effective culture of GAS.

Methods: The media included BBL Trypticase Soy with 5% Sheep Blood Agar incubated anaerobically (BAP), BBL Group A Selective Strep Agar with 5% Sheep Blood incubated in 5% CO_2 (BBL), Remel Strep A Isolation Agar incubated in 5% CO_2 (REM), and Hardy GBS Detect Agar incubated in ambient air (GBSD). A total of 699 throat swabs were placed into 200 µL of Tris EDTA buffer and vortexed for 1 min. Plates were inoculated with 25 µL of eluted specimen, streaked for isolation using a BD InocuLab, incubated at 35°C, and examined at 24 and 48 h. Beta-hemolytic colonies were tested with Streptex® Latex Group A (Remel, Lenexa, KS) and occasionally with catalase reagent.

Results: A total of 63 GAS isolates were recovered with an overall positivity rate of 9%. The recovery rates for each medium at 24/48 h were: BAP 54/55 (86/87%), BBL & REM 51/57 (81/90%), and GBSD 57/58 (90/92%). Five (8%) isolates were missed by BAP due to low numbers, and 3 (5%) GAS were overgrown. Six (10%) isolates were missed by BBL due to a failure to grow. Four (6%) isolates were missed by REM due to low numbers, and 2 (3%) GAS failed to grow. Five (8%) isolates were missed by GBSD due to low numbers. The incidence of non-GAS beta-hemolytic colonies requiring latex testing for each medium at 24/48 h were: BAP 152/220 (22/31%), BBL 34/58 (5/8%), REM 29/35 (4/5%), and GBSD 72/105 (10/15%). The number of subcultures required for each medium at 24/48 h was: BAP 37/70 (5/10%), BBL 20/24 (3/3%), REM 12/13 (2/2%), and GBSD 19/28 (3/4%).

Conclusions: GBSD detected the most (90%) isolates after 24 h. Incubation of GBSD and BAP beyond 24 h did little to improve the sensitivity (2%), and had a negative impact on specificity. However, the sensitivity of BBL and REM increased by nearly 10% with the full 48 h incubation. Although GBSD is the most expensive medium, it moderates the amount of latex testing required, reduces subcultures, eliminates the need for anaerobic or CO_2 incubation, and reduces labor and result turn-around-time by 50% by permitting culture completion at 24 instead of 48 h. These findings prompted our lab to switch from BAP to GBSD for culture of GAS from throat swabs.