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Title: RAPID MOLECULAR POINT-OF-CARE TEST FOR STREP A PHARYNGITIS IN REMOTE-LIVING SCHOOL AGED CHILDREN

Authors: Janessa Pickering, Dylan D Barth, Rebecca Famlonga, Delia Lawford, Robyn Macarthur, Shelley Kneebone, Narelle Ozies, Abbey Ford, Gelsa Cinnani, Slade Sibosado, Liam Bedford, Liam Bedford, Jonathan Carapetis, Asha Bowen, Bernadette Wong

Background & Aims: Accurate and timely diagnosis of Strep A pharyngitis in remote settings can be challenging. The availability of molecular point-of-care testing (PoCT) for Strep A pharyngitis may revolutionise primary prevention strategies in children at high risk of acute rheumatic fever. We aimed to evaluate the performance of a rapid molecular PoC test for Strep A pharyngitis in remote-living children in the Western Australia (WA).

Methods: Our primary school based prospective surveillance program evaluated the epidemiology of Strep A infection in two towns within the Kimberley WA, comprising: (1) cross-sectional screening two times a year, and (2) weekly active surveillance visits once a week. Between April 2021 and September 2022, consented children were screened for pharyngitis and provided throat swabs for gold standard microbiological culture and PoCT using the Strep A ID NOW machine. We calculated the sensitivity, specificity, positive (PPV) and negative predictive values (NPV). PoC test performance was compared to the microbiological culture results.

Results: 211 school children (aged 5 to 15 years) were enrolled; swabs for PoCT evaluation were collected from April 2021 to September 2022 from children reporting and/or presenting with sore throat symptoms. 183 episodes of sore throat were recorded from 77 children who all underwent PoCT. Matched microbiological swabs for culture were available for 181 episodes. 39/181 (21.5%) throat swabs cultured B-haemolytic colonies and of these, 20 (11%) were confirmed Strep A (+). 17 episodes (85%) of sore throat were Strep A culture and POCT (+). 3 Strep A culture (+) swabs were PoCT (-), however purified Strep A isolates were PoCT (+) suggesting inefficient throat swabbing rather than PoCT failure. We calculated a POCT sensitivity of 85.0%, specificity of 80.75%, PPV 35.45% and NPV 97.74%.

Conclusions: Using PoCT to detect Strep A sore throats enabled immediate treatment referral. There is a clear advantage in a shortened turnaround time for testing, demonstrating the value of PoCT. Our small study cohort and testing multiple tools to detect Strep A pharyngitis are limitations to the stringent quality of testing. At each episode, 3 throat swabs were collected accounting for the reduced sensitivity. When culture and purification of Strep A isolates were combined, sensitivity was 100%. Our next steps include expansion of Strep A PoCT in a larger, national programme to prevent rheumatic fever.