How do the rapid strep antigen tests and throat culture compare when testing for strep?

Evidence-Based Answer

Rapid strep tests have higher specificity than sensitivity. (SOR: B, based on cohort studies.) A negative rapid antigen diagnostic test (RADT) should be backed up by a throat culture in children. A RADT can be used as a stand-alone test in adults, or if previously validated as having comparable sensitivity and specificity with a throat culture. (SOR: C, based on expert guidelines.)

A 2007 retrospective study of more than 18,000 pediatric patients being evaluated for pharyngitis used 2 different second-generation RADTs. Of this cohort, 4,342 (24%) of the RADTs were positive. Negative RADTs (about 14,000) were followed by a throat culture; of these, 968 (6.8%) were positive. The sensitivity of the RADTs was calculated to be 82% and specificity to be 99.2%. The likelihood ratio of a positive test (LR+) was 102, and of a negative test (LR–) was 0.18.¹ A major weakness of the study was that not all patients were cultured, and some numbers provided were author estimates.

A prospective cohort study, done in 2003 in a pediatric emergency department setting, included 213 children with a clinical diagnosis of pharyngitis. All participants were tested with a RADT. Cultures were obtained for children with negative RADTs. A final diagnosis of group A strep pharyngitis was obtained in 33 patients. The RADT was positive in 21 of these patients. Eleven samples were negative on RADT but positive on follow-up throat culture. One weakly positive RADT was negative at culture follow-up. With the prevalence of streptococcal pharyngitis at 15.9% in the study population, the sensitivity of the RADT was 21 of 32 or 65.6% and the specificity was 168 of 169 or 99.4% (LR+ 109.3 and LR– 0.346).² A major weakness of this study was that cultures were not obtained from all participants. Patients with a positive RADT were assumed to be true cases. One weakly positive RADT was followed up with a negative culture and was counted as a true negative.

A 2010 prospective study evaluated 100 consecutive adult patients (aged 18-64 years) with symptoms of acute pharyngitis at an emergency department. Both RADTs and cultures were done. RADTs were found to have a sensitivity of 68.2% and a specificity of 89.7% (LR+ 6.43 and LR– 0.36).³

A previous RCT also compared the sensitivity, specificity, and cost-effectiveness of a RADT with throat culture in adults. Three hundred seventy-two adult patients with a clinical diagnosis of pharyngitis had both throat culture and RADT performed. Compared with throat culture, the RADT achieved a global sensitivity of 91.4% and a specificity of 95.3% (LR+ 19 and LR– 0.09). The positive predictive value was 92% and negative predictive value was 95%. After comparing the costs of testing and treatment with the appropriateness of treatment, systematic RADT without culture back-up was found to be more cost-effective than routine throat culture.⁴

The Infectious Diseases Society of America and the American Academy of Pediatrics recommends using a throat culture as back-up for a RADT in children and adolescents with negative tests.⁵ RADTs may be used as a stand-alone test in adults, or if an RADT has been previously validated by a culture.⁵

Kyle I. Diaz, MD
Philipp Narciso, MD
AHEC-South Arkansas
El Dorado, AR


“Evidence based medicine is the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research.”