BinaxNOW® S.pneumoniae

Point-of-care urinary pneumococcal antigen test in the emergency department for community acquired pneumonia.

Weatherall C, Paoloni R, Gottlieb T.
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Abstract BACKGROUND: *Streptococcus pneumoniae* is the most common cause of community-acquired pneumonia (CAP). Early diagnosis would allow more directed therapy and confidence in appropriate treatment for a majority of patients. The BinaxNOW pneumococcal urinary antigen (PNAG) test has been evaluated at laboratory level and is easy to perform and interpret, but its use as a point-of-care test has not been evaluated. A study was undertaken to assess whether PNAG testing can be reliably performed and interpreted by staff in an adult emergency department and whether rapid results influence initial treatment decisions. METHODS: Community-living adult patients presenting to the emergency department with clinical and radiological findings of pneumonia had PNAG testing performed on the same sample in both the emergency department and the microbiology laboratory in a blinded fashion. Accuracy and turnaround time were assessed. Diagnostic yield was compared with routine culture methods. RESULTS: Fifty-nine patients were enrolled of whom nine (15%) had positive PNAG tests. These included three culture-proven cases and six additional cases. There was 98% concordance between emergency department and laboratory results. Turnaround time was significantly shorter when tested in the emergency department (median 2 h 39 min vs 19 h 40 min). Antibiotic prescribing was not influenced by results in this small sample. CONCLUSIONS: PNAG diagnosis of pneumococcal pneumonia can be accurately performed as a point-of-care test by emergency department clinical staff. Without specific efforts to achieve early urine collection, the timeframe of testing will frequently fall outside the 4-hour patient stay of a UK emergency department and may be more appropriately considered as a test for the medical admissions unit in this setting. Sensitivity is at least equal to conventional culture methods and the result is available rapidly enough to potentially influence treatment decisions, a strategy that warrants further investigation.

Results and Discussion

Under the British Thoracic Society (BTS) guidelines on community acquired pneumonia, the ability to confirm pneumococcal aetiology for patients requiring hospital admission would allow monotherapy (benzyl penicillin or amoxicillin) rather than combination therapy to be given. This makes treatment less costly and may reduce the emergence of antibiotic resistance due to exposure to unnecessarily broad-spectrum antimicrobials.

The BinaxNOW *S. pneumoniae* urinary antigen test was evaluated to assess its use as a point of care test in the ED (Emergency Department) setting. A 98% concordance (100% sensitivity and 98% specificity) was demonstrated between results obtained in the ED to that obtained in the Microbiology laboratory.

The ease of use of BinaxNOW *S. pneumoniae* allowed reliable testing by nursing staff after a single training session. This allowed test results to be available within 4 hours regardless of time of day, while simultaneously increasing the diagnostic yield in patients with pneumonia from 22% to 32%. The turnaround time for results by the Microbiology laboratory was 19 hours 40 mins (median time).

More timely confirmation of pneumococcal pneumonia may allow incorporation of this information into decisions regarding initial antibiotic choice.

Making the BinaxNOW *S. pneumoniae* test available in the ED carries the additional possibility of rapid antigen detection from cerebrospinal fluid (CSF) in suspected pneumococcal meningitis, a setting in which the test has also been validated.