

A detection dog to identify patients with Clostridium difficile infection during a hospital outbreak

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Highlights

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Early and rapid identification of Clostridium difficile infections (CDI) is important to prevent transmission.

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A detection dog had high diagnostic accuracy (sensitivity 86%; specificity 97%) for bedside diagnosis of CDI patients.

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For 2 CDI negative patients the dog repeatedly indicated a positive response; both did prove CDI positive weeks later.

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More research is needed to see if the use of sniffer dogs can lead to a quicker diagnosis, and improve outbreak management.

Summary

Objectives

Early and rapid identification of Clostridium difficile infections (CDI) is important to prevent transmission. In this study we assessed the diagnostic accuracy of a trained detection dog for detecting CDI cases on hospital wards in an outbreak setting.

Methods

During a CDI outbreak in a large Dutch university hospital, we screened affected hospital wards repeatedly with a trained detection dog. The dog's response was compared to the clinical diagnosis, supported by laboratory results.

Results

During a total of 9 hospital visits, the dog performed 651 screenings involving 371 participants. The dog correctly identified 12 out of 14 CDI cases [sensitivity 86% (95% confidence interval (CI): 56–97%)] and 346 out of 357 CDI negative participants [specificity of 97% (95% CI: 94–98%)]. Interestingly, of the 11 CDI negative participants that were 'falsely' indicated by the dog as positive, 2 (18%) did actually developed CDI during the 3 months of follow-up after the detection period; compared to only 12 of the 346 participants (3.5%) that the dog identified as C. difficile negative ($p = 0.06$).

Conclusion

A trained detection dog can accurately detect CDI in hospitalized patients during an outbreak. A (repeated) positive dog response is a strong indication of a CDI episode coming, be it the next day or possibly up to a month.

Keywords

Clostridium difficile;
Sensitivity and specificity;
Outbreak containment;
Scent detection;
Detection dog

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