Evaluation of a new PCR-based platform for the rapid detection and identification of faecal parasites from swab transport devices

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Introduction

Intestinal parasites can be significant causes of infectious gastroenteritis. Diagnosis traditionally requires specialist investigation using microscopy and immunofluorescent staining. The advent of polymerase chain reaction (PCR) techniques provides a rapid and sensitive alternative methodology which may be better suited to the work flow in busy laboratories.

The BD Max™ Enteric parasite Panel (EPP) allows the rapid testing of faecal specimens for the parasites Giardia lamblia, Cryptosporidium (C. hominis and C. parvum) and Entamoeba histolytica using the BD Max™ System. Fecal Transwab® is a swab based transport device for the collection of faecal specimens directly from patients using a rectal swab, and transport in a liquid medium. The medium can be tested by conventional culture means for bacteria, and by PCR-based methods for both bacteria and viruses. The present study was designed to demonstrate the feasibility of using such specimens with EPP for the detection of intestinal parasites. This would allow single parasites to be rapidly tested for all three classes of pathogen while remaining available for confirmatory testing and characterisation.

Methods

22 stool samples which had previously been tested by conventional means and confirmed to be positive for Giardia lamblia or Cryptosporidium species were sampled using Fecal Transwab®. Two formats were used. The standard Fecal Transwab® has a Sigma Swab with polyurethane foam tip, while Fecal Transwab® PF has a PurFlock® Swab with tip composed of multi-length multifilament flocked fibres. Both formats use the same medium (Liquid Cary Blair) so the study will also reveal if there is any remaining available for confirmatory testing and characterisation. None of the specimens failed to give a DNA from intestinal parasites using the EPP test panel on the BD Max™ System. There was complete correlation between the original results for the stool specimens, and those obtained from the same samples sampled and transferred using Fecal Transwab®. Both swab types (Sigma swab foam or PurFlock®) gave acceptable results.

Results

All results matched between the respective original stool samples and the specimens processed using Fecal Transwab® with either Sigma Swab® (foam tip) or PurFlock® Swab. There was good correlation between the Ct values for both swab types, with no false results from the negative controls. The Ct values with the swabs were higher than for the original samples and the samples processed using Fecal Transwab® PF with liquid Cary Blair medium offers a convenient and flexible method for diagnosing the pathogens responsible for infectious gastroenteritis.

Conclusion

The present study has demonstrated that faecal specimens collected with FecalTranswab® are suitable for testing for DNA from intestinal parasites using the EPP test panel on the BD Max™ System. There was complete correlation between the original results for the stool specimens, and those obtained from the same specimens sampled and transferred using Fecal Transwab®. Both swab types (Sigma swab foam or PurFlock®) gave acceptable results.

Fecal Transwab® has previously been shown to be suitable for recovery of a range of enteric bacteria by culture, and for the identification of bacteria and viruses by molecular techniques. This study has demonstrated the device is also compatible with a PCR based method for the detection and accurate identification of the intestinal parasites Giardia lamblia and Cryptosporidium using either of the swab types. The use of rectal swabs with Fecal Transwab® or Fecal Transwab® PF with liquid Cary Blair medium offers a convenient and flexible method for diagnosing the pathogens responsible for infectious gastroenteritis.

References