

eP461

ePoster Viewing

MALDI-TOF

A RAPID LATEX AGGLUTINATION TEST TO DISTINGUISH SHIGELLA FROM ESCHERICHIA COLI: PATCHING THE MALDI-TOF "ACHILLES' HEEL"

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Objectives: While MALDI-TOF has dramatically improved the quality and turn-around-times for organism identifications from culture, it is unable to differentiate the protein profiles of *Shigella* from closely-related *E. coli* which has created new problems. This study evaluated the Wellcolex Colour Shigella kit (Oxoid), a simple 2-minute/2-pool latex agglutination test, as a means to distinguish *Shigella* from non-lactose fermenting (NLF) oxidase-negative Gram-negative bacilli identified as *E. coli* by the VITEK MS PLUS system (bioMérieux; IVD database). The kit comprises two reagent pools, each of which contains a mixture of red and blue coloured latex particles with each latex type specifically sensitized to react with one (of four) species within the genus *Shigella*, but not with *E. coli*.

Methods: 238 isolates were used for this study: 114 retrospective strains comprising 87 *Shigella* (50 *S. flexneri*, 29 *S. sonnei*, 7 *S. boydii*, and 1 *S. dysenteriae*); 27 NLF *E. coli* derived from 4 large centralized clinical laboratories serving numerous health facilities in the Greater Toronto Area; and 124 semi-consecutive prospective NLF isolates identified from diverse specimen types on MacConkey agar as *E. coli* by VITEK MS PLUS at one laboratory site. To prevent bias, isolate identities were blinded during testing. The latex agglutination test was completed and interpreted as per kit instructions. Statistics were calculated using www.graphpad.quickcalcs.com.

Results: All 87 *Shigella* reacted with the Wellcolex Colour Shigella kit (Sensitivity: 100%; 95%CI: 94.9-100) and all were identified correctly to the species level based on the reagent pool and colour of the latex agglutination following kit instructions. 149 of 151 NLF *E. coli* correctly did not agglutinate with either latex pool in the kit (Specificity: 98.7%; 95%CI: 95.0-100). The 2 NLF *E. coli* that cross-reacted reproducibly did so with Reagent-1 blue latex which would be interpreted as *S. flexneri* based on kit instructions. Both were confirmed to be *E. coli* (VITEK 2 GNI, API 20E, no reactivity with the Remel *Shigella* anti-sera) and on retesting from 48h cultures, the reactions became clearly recognizable as auto-agglutination (clumping). The resulting specificities (95%CI) by species type for *S. flexneri*, *S. sonnei*, *S. boydii*, and *S. dysenteriae*-sensitized latex particles were 98.9% (96-99.96), 100% (97.8-100), 100% (98-100), and 100% (98.1-100), respectively.

Conclusions: This study demonstrates that the Wellcolex Colour Shigella kit is able to accurately and rapidly distinguish *Shigella* from *E. coli* in NLF, oxidase-negative Gram-negative bacilli identified as *E. coli* by VITEK MS PLUS. It is a low-complexity, cost-effective solution that provides results in a few minutes without disrupting workflow. A negative Wellcolex kit result rules out *Shigella* without the need for additional testing. However, since 2 *E. coli* were shown to cross-react, positive results should be confirmed by an alternate means.