

The cytopathic effect of different toxin concentrations from different *Clostridioides difficile* ST strains in Vero cells

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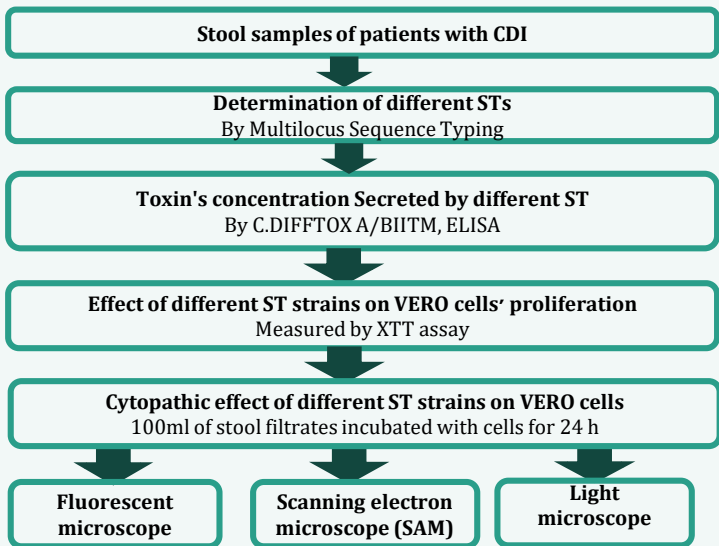


Introduction

Clostridium difficile is a Gram-positive, spore-forming anaerobic rod and a leading cause of Nosocomial diarrhea. Our goal was to determine the toxins levels secreted by different *C. difficile* strains and to evaluate the effects of different toxin concentrations from different *C. difficile* ST strains on viability of cell culture.

It is important to recognize patients with severe disease due to high risk of complications and death.

Methods and work design



Results

- ❖ significant differences in toxins' concentrations between the different STs (Figure 1). In particular, ST42 and ST104 strains secreted significantly higher concentrations of toxins compared to all other groups ($p < 0.001$).
- ❖ Exposure of Vero cells to *C. difficile* strains which secrete high toxins levels (ST42 and ST104) caused an immediately decrease in cell proliferation (Figure 2).
- ❖ The supernatants from the seven ST strains elicited a cytopathic effect (CPE) in Vero cells, with *C. difficile* ST42 and ST104 imparting the highest effects. Cells that were exposed to toxins from ST42 and ST104 were rounded and the number of attached cells was lower, compared to control cells in different microscopes (Figures 3- 5).

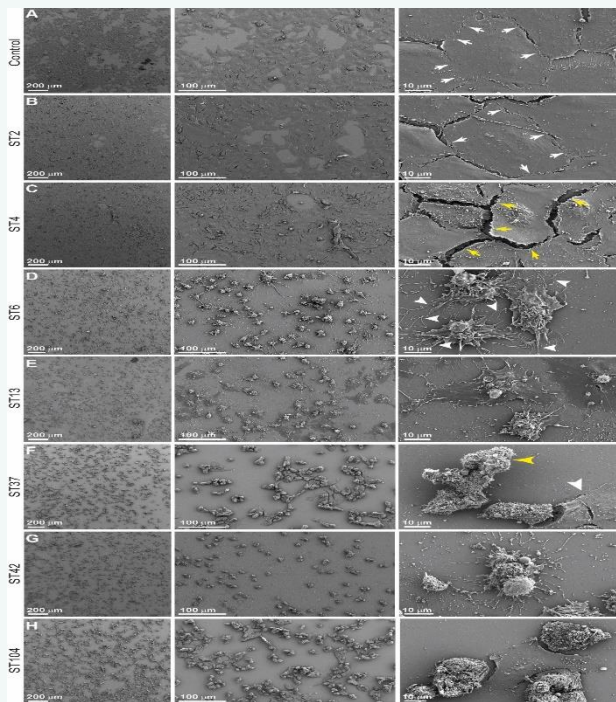


Figure 5. Cytopathic effect of different ST strains on Vero cells (Electronic microscope).

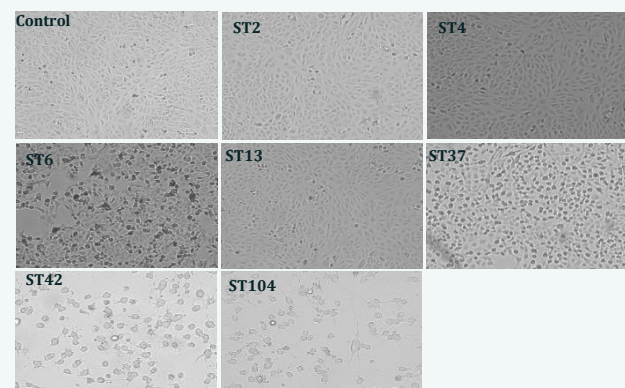


Figure 3. Cytopathic effect of different ST strains on Vero cells (Light microscope)

Conclusion

- ❖ This study demonstrates, for the first time, differences between the ST strain types in toxin concentrations and their effects on cells' morphology and activity. High levels of fecal toxins can cause more significant destruction of intestinal cells and rapid deterioration in patients.
- ❖ The levels of fecal toxins can be quickly diagnosed to provide an accurate information on the severity of CDI. This will help to give more aggressive treatment when necessary.

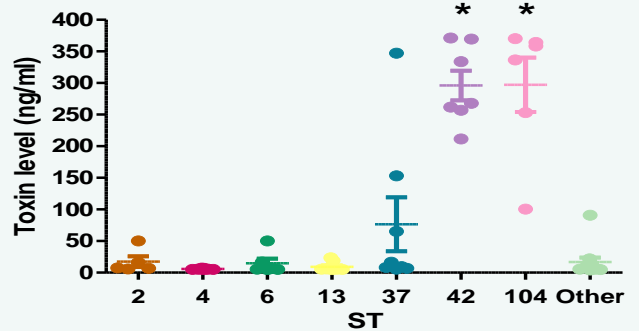


Figure 1. Toxins concentration Secreted by different ST.

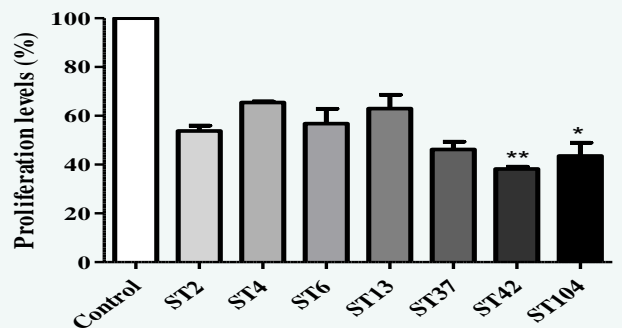


Figure 2. Effect of different ST strains on Vero cells' proliferation.

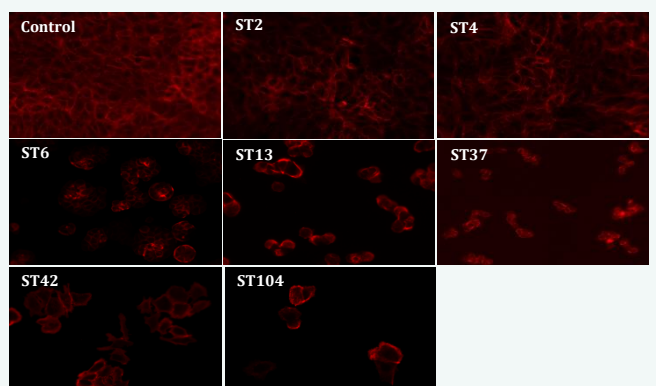


Figure 4. Cytopathic effect on VERO cells (Fluorescent microscope)