A Comparison of the Cytotoxic Effects of Clostridium Difficile Toxins A and B on Peripheral Blood Monocytes and Intestinal Macrophages

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Background

Clostridium difficile associated colitis is mediated by its toxins A and B and results in recruitment of immune cells to the intestinal mucosa. Subsets of immune cells have previously been shown to be differentially susceptible to toxin A. However, there is little research on their interactions with toxin B.

Aims & Objectives

To compare the effects of toxins A and B on peripheral blood monocytes and intestinal macrophages.

Material & Methods

Varying concentrations of purified toxins were incubated with either human intestinal lamina propria cells or washed whole blood cells at 37°C for 1h. The reduction in cell size (indicative of subsequent cell death) was analysed by flow cytometry, using antibody markers for CD14 and HLA-DR to identify the cells of interest.

Results

Compared with that of toxin A, a significantly greater reduction in both monocyte and macrophage cell size was elicited by toxin B at 2.5, 5 and 10ìg/ml in a concentration-dependent manner. In addition, monocytes were significantly more susceptible than macrophages to the effects of toxin B, although the same was not shown to be true for toxin A. A subpopulation of macrophages expressing CD14 appeared to be more susceptible to toxin B than CD14- macrophages.

Conclusions

Our study demonstrates that toxin B exhibits greater cytotoxic effects on monocytes and macrophages compared to toxin A, which may have implications in the immune response to *Clostridium difficile* infection. A difference in susceptibility of the immune cell subsets to toxin B has also been suggested.