Suppressive Effect of Berry Phenolics on *Helicobacter pylori* Infection

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RATIONALE & OBJECTIVES

Helicobacter pylori (H. pylori) is one of the major risk factors of gastric cancer. Thus, it is urgently necessary to develop a non-antibiotic alternative therapy to increase the eradication rates of H. pylori. Some literatures reported that cranberry may inhibit H. pylori adhesion to the human gastric mucus. However, the therapeutic possibility of other berries on H. pylori was rarely discussed. Thus, the aims of this experiment were to explore the impact of cranberry, blueberry, grape seed and mixed-berry extract on the growth, infectivity and pathogenicity of H. pylori *in vitro*.

MATERIALS & METHODS

Agar disc diffusion method was used to compare the antimicrobial activities of the four berry extracts against H. pylori. For evaluating the inhibition of the four berry extracts on the adhesion of H. pylori, we first observed the adhesion of fluorescence-labeled H. pylori to the human gastric cancer cell line AGS under fluorescence microscope. Then, we used urease test to quantitate the H. pylori density adhesion to AGS cells. In addition, interleukin-8 secretion from AGS cells after H. pylori infection was measured by enzyme-linked immunosorbent assay.

RESULTS & FINDINGS

In results, inhibition zone assessment revealed that grape seed extract had the best inhibition effect on H. pylori in a dose-dependent manner. However, cranberry extract had no antimicrobial activity against H. pylori. (Fig. 1) Furthermore, the fluorescence microscopic observation showed that significant reduction of fluorescence-labeled H. pylori adhesion to AGS cells by berry extracts.

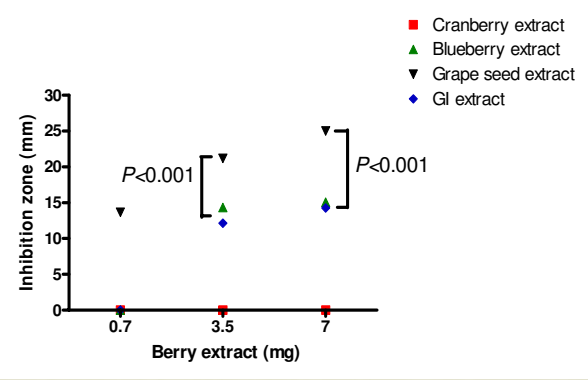

Figure 1: Inhibition zone comparison of all berry extracts.

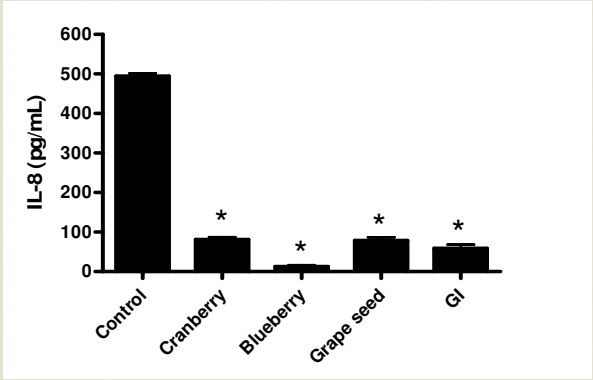

Figure 3: Berry extracts inhibit IL-8 secretion.

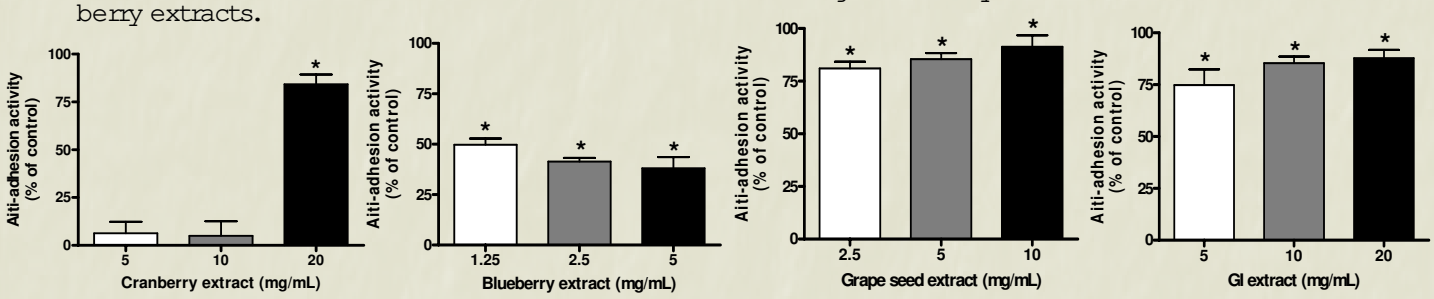

Figure 2: Berry extracts inhibit H. pylori adhesion to AGS cells. *Significantly different from the control group ($p<0.05$).

The highest concentration of berry extracts against the adhesion of H. pylori to AGS cells and the percentage of adhesion inhibition determined by urease test were 20 mg/mL and 84% for cranberry extract, 5 mg/mL and 38% for blueberry extract, 10 mg/mL and 91% for grape seed extract, 20 mg/mL and 88% for GI extract, respectively. (Fig.2) In addition, the berry extract concentration and the percentage inhibition of H. pylori-induced IL-8 secretion from AGS cells were cranberry extract (5 mg/mL; 84%), blueberry extract (1.25 mg/mL; 97%), grape seed extract (0.075 mg/mL; 84%) and GI extract (0.15 mg/mL; 88%), respectively. (Fig.3)

CONCLUSION

The results suggest that cranberry and other berry extracts may suppress the pathogenicity of H. pylori through the growth inhibition, reduction of H. pylori adhesion and H. pylori-induced IL-8 secretion from gastric cells.

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