Hemodynamics after endoscopic submucosal injection of epinephrine in a porcine model.

Abstract:

Endoscopic submucosal injection of epinephrine may cause systemic effects on the cardiovascular system. The aim of this experimental study was to assess systemic hemodynamic changes after submucosal injection of epinephrine during upper gastrointestinal endoscopy in a porcine model. Measurements were taken from 12 pigs under general anesthesia. During gastroscopy 5 mL of normal saline, and 2.5 mL and 5 mL of epinephrine (1:10,000) were injected into the submucosal layers of the gastric antrum, corpus, and distal esophagus. After each injection, the cardiac index and global end diastolic volume index (GEDVI, reflecting preload) were measured every 3 minutes by transpulmonary thermodilution for a minimum of 12 minutes. The following parameters were also recorded: heart rate, mean arterial pressure (MAP), and systemic vascular resistance index (SVRI, reflecting afterload). Significant hemodynamic changes were observed after submucosal injection of epinephrine into the esophagus, including heart rate (maximum +4%) and MAP (maximum -4%) after injection of 2.5 mL epinephrine, and stronger changes in heart rate (maximum +13%), cardiac index (maximum +21%), MAP (maximum -4%), and SVRI (maximum -12%) after the injection of 5 mL epinephrine. After submucosal injection of epinephrine into the gastric antrum and corpus,
hemodynamic effects were less evident. Here significant changes were observed in heart rate (maximum +3%), MAP (maximum -2%), cardiac index (maximum +7%), and SVRI (maximum -8%) only after the injection of 5 mL epinephrine into the antrum. Endoscopic submucosal injection of epinephrine is associated with changes in systemic hemodynamic parameters, especially when performed in the esophagus, and the procedure might therefore induce harmful side effects.