

Original Paper

## Insulin-Induced Hypoglycemia Stimulates Gastric Vagal Activity and Motor Function without Increasing Cardiac Vagal Activity

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### Key Words

- Drinking capacity
  - Gastric emptying
  - Glucose clamp
  - Intra-gastric volumes
  - Vagal tone
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### Abstract

**Background/Aims:** We investigated whether increasing the efferent vagal activity by insulin-induced hypoglycemia would enhance gastric emptying and volumes in healthy subjects. **Methods:** Twenty healthy volunteers (10 males) were examined with and without vagal stimulation by insulin-induced hypoglycemia using a glucose clamp technique. Stomach function was tested by drinking meat soup (0.04 kcal ml<sup>-1</sup>) at a rate of 100 ml min<sup>-1</sup> until maximal capacity. Intra-gastric volume at maximal drinking capacity was determined by three-dimensional ultrasound. Respiratory sinus arrhythmia (RSA) was used as an index of cardiac vagal activity and plasma pancreatic polypeptide (PP) as a measure of gastric vagal activity, and skin conductance (SC) as a measure of sympathetic tone. **Results:** Insulin-induced hypoglycaemia increased drinking capacity ( $p = 0.002$ ), gastric emptying ( $p = 0.02$ ), PP ( $p = 0.004$ ) and SC ( $p = 0.004$ ), while intra-gastric volume was unchanged ( $p = 0.7$ ) and RSA decreased ( $p = 0.03$ ). **Conclusion:** Enhancement of gastric vagal activity by insulin-induced hypoglycemia increased drinking capacity and gastric emptying similarly, resulting in an unchanged intra-gastric volume. Enhanced efferent vagal activity to the stomach (as measured by PP) was not associated by enhanced cardiac vagal activity (as measured by RSA), possibly a consequence of stress-induced sympathetic activation during the procedure.