

Morphine induced nausea: Relationship among gastric myoelectrical activity, plasma vasopressin and nausea

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Abstract

AIM: Narcotic induced nausea is poorly understood and a major problem in many patients requiring pain control. The aim of this study was to induce nausea with infusion of morphine sulfate (MS) and to measure changes in plasma vasopressin levels and gastric myoelectrical activity.

METHODS: 50 healthy subjects (35 men, mean age 26.5 ± 8 years, and 15 women, mean age 24.5 ± 3 years) were given morphine (0.15 mg/kg *i.v.*). Nausea scores were recorded and blood samples were collected before and every 15 min after MS infusion for 180 min. If no nausea was reported after 60 min, then another 0.05 mg/kg of MS was given (max dose/subject was 15 mg). Plasma vasopressin (AVP) levels were measured by RIA. Nausea scores were recorded on

a 1-10 scale (0 indicated no nausea and 10 severe nausea). Gastric myoelectrical activity was recorded by electrogastrography and the electrogastragrams (EGGs) were analyzed visually and by running spectral analysis.

RESULTS: Forty-two of 50 (84%) of the subjects developed nausea with scores from 1 to 10. AVP levels did not change from baseline in subjects who had no nausea despite receiving MS ($n = 8$). AVP increased significantly 15 to 30 min after the nausea was first reported, AVP levels correlated with the maximum nausea score ($r = 0.42$, $P = 0.002$), 3.6-9.9 cpm tachygastric activity correlated with the nausea score ($r = 0.40$, $P = 0.004$) and tachygastric activity also correlated positively with vasopressin levels ($r = 0.40$; $P = 0.0004$).

CONCLUSIONS: (1) Morphine infusion was a safe and efficient method to evoke moderate to severe nausea in healthy subjects; (2) Tachygastric and plasma vasopressin levels are objective physiological markers for that correlated with the intensity of opioid induced nausea, and (3) Whether plasma vasopressin causes tachygastric or tachygastric activity causes vasopressin release is a brain gut interaction that requires further study.

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