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Title: Colonoscopy quality with Entonox® versus intravenous conscious sedation: 18608 colonoscopy retrospective study

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1 What did this study explore?

This study aims to explore the comparative quality of colonoscopies performed with nitrous oxide gas (Entonox®) against intravenous conscious sedation using midazolam, with, or without an opioid.

2 How did the authors perform all experiments?

A retrospective analysis was performed on a prospectively held database of 18,608 colonoscopies carried out in Lothian health board hospitals between July 2013 and January 2016. The quality of colonoscopies performed with Entonox was compared to intravenous conscious sedation.

Furthermore, the quality of colonoscopies performed with an unmedicated group was compared to IVM.

3 How did the authors process all experimental data?

Relevant patient and procedural data was recorded by the endoscopist/nurse at the time of colonoscopy using Unisoft's electronic GI Reporting Tool (Unisoft Medical Systems, Enfield, UK). The database was retrospectively analysed.

The data were exported from the Unisoft GI reporting tool to an Excel 2016 spreadsheet (Microsoft Corporation, WA, USA). The statistical analysis was subsequently performed by importing the data into the software package R Version 3.2.3 (R Foundation for Statistical Computing, Vienna, Austria).

The caecal intubation and polyp detection variables were separately analysed using binary logistic regression to assess for an association with different types of colonoscopy analgesia/sedation. The caecal intubation and polyp detection fields were treated as binary dependent variables. Patient age and gender were included as independent variables.

4 How did the authors deal with the pre-study hypothesis?

The study used the following key markers of colonoscopy quality: (1) patient comfort scores, (2) caecal intubation rates (CIRs), and (3) polyp detection rates (PDRs). We used binary logistic regression to model the data.

5 What are the novel findings of this study?

Previous studies have shown that colonoscopies performed with Entonox® gas are not associated with more patient discomfort, or lower caecal intubation rates (CIRs), than those performed with intravenous conscious sedation. We have completed the largest and most comprehensive real-world retrospective study of Entonox use in colonoscopy. In particular, we compare colonoscopy quality with Entonox against intravenous conscious sedation using midazolam plus opioid. This study shows that Entonox is not associated with lower colonoscopy quality when compared to intravenous conscious sedation. Based on the results of this study, Entonox remains an attractive option for colonoscopy analgesia and sedation.

Thank you again for publishing our manuscript in the *World Journal of Gastrointestinal Endoscopy*.

Sincerely yours,

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