World Journal of Gastroenterology

Submit a Manuscript: http://www.wjgnet.com/esps/
Help Desk: http://www.wjgnet.com/esps/helpdesk.aspx
DOI: 10.3748/wjg.v23.i3.560

World J Gastroenterol 2017 January 21; 23(3): 560-562
ISSN 1007-9327 (print) ISSN 2219-2840 (online)

Endoscopic ultrasound sedation in the United Kingdom: Is life without propofol tolerable?

Jennifer Anne Campbell, Andrew James Irvine, Andrew Derek Hopper

Jennifer Anne Campbell, Andrew James Irvine, Andrew Derek Hopper, Department of Gastroenterology, Royal Hallamshire Hospital, Sheffield S10 2JF, United Kingdom

Author contributions: Campbell JA wrote this letter, analysed and interpreted data; Irvine AJ and Hopper AD contributed to conception and design of the study, acquisition of data, and analysis and interpretation of data and approved the final version of the article to be published.

Conflict-of-interest statement: All authors are employed by Sheffield Teaching Hospitals NHS Foundation Trust. No funding was required for this study and there are no competing interests to declare.

Manuscript source: Unsolicited manuscript

Correspondence to: Jennifer A Campbell, Department of Gastroenterology, Royal Hallamshire Hospital, Room P39, Glossop Road, Sheffield S10 2JF,
United Kingdom. jennifer.campbell@sth.nhs.uk
Telephone: +44-114-2712353
Fax: +44-114-2712692

Received: October 4, 2016
Peer-review started: October 7, 2016
First decision: November 9, 2016
Revised: November 15, 2016
Accepted: December 2, 2016
Article in press: December 2, 2016
Published online: January 21, 2017

Abstract

There is compelling evidence to support the quality, cost effectiveness and safety profile of non-anesthesiologist-administered propofol for endoscopic ultrasound (EUS). However in the United Kingdom, it is recommended that the administration and monitoring of propofol sedation for endoscopic procedures should be the responsibility of a dedicated and appropriately trained anaesthetist only. The majority of United Kingdom EUS procedures are performed with opiate and benzodiazepine sedation rather than anaesthetist led propofol lists due to anaesthetist resource availability. We sought to prospectively determine the tolerability and safety of EUS with benzodiazepine and opiate sedation in single United Kingdom centre. Two hundred consecutive patients undergoing either EUS or oesophago-gastroduodenoscopy (OGD) with conscious sedation were prospectively recruited with a 1:1 enrolment ratio. Patients completed questionnaires pre and post procedure detailing anticipated and actual pain experienced on a 1-10 visual analogue scale. Demographics, procedure duration, sedation doses and willingness to repeat the procedure were also recorded. EUS procedures lasted significantly longer than OGDs (15 min *vs* 6 min, $P < 0.0001$), however, there was no difference in anticipated pain scores between the groups (EUS 3.37/10 *vs* OGD 3.47/10, $P = 0.46$). Pain scores indicated EUS was better tolerated than OGD (1.16/10 *vs* 1.88/10, $P = 0.03$) although higher doses of sedation were used for EUS procedures. There were no complications identified in either group. We feel our study demonstrates that the tolerability of EUS with opiate and benzodiazepine sedation is acceptable.

Key words: Sedation; Endoscopy; Tolerability; Propofol; Endoscopic ultrasound

Core tip: Strong evidence exists to support safety and tolerability of non-anaesthesiologist-administered propofol for endoscopic ultrasound (EUS) procedures. United Kingdom guidelines, however, recommend

propofol is administered only by anaesthesiologists. Consequently, in the United Kingdom, nearly all EUS procedures are performed with combinations of benzodiazepine and opiate sedation for which little tolerability data exists. This letter shares the experience of a single EUS centre using benzodiazepine and opiate sedation demonstrating it can be safe and the resulting tolerability acceptable.

Campbell JA, Irvine AJ, Hopper AD. Endoscopic ultrasound sedation in the United Kingdom: Is life without propofol tolerable? *World J Gastroenterol* 2017; 23(3): 560-562 Available from: URL: http://www.wjgnet.com/1007-9327/full/v23/i3/560.htm DOI: http://dx.doi.org/10.3748/wjg.v23.i3.560

TO THE EDITOR

We read with interest the review by Cheriyan and Byrne analysing the benefits of propofol sedation in advanced endoscopic procedures and endoscopic ultrasound (EUS)[1]. Whilst we agree that there is compelling evidence to support the quality, cost effectiveness and safety profile of non-anaesthesiologist-administered propofol (NAAP) for EUS (including gastroenterologist and nurse administration)[1-3], there are current restrictions in the United Kingdom which make NAAP difficult to implement for all EUS procedures. Propofol can produce transient apnoea or general anaesthesia for which there is no reversal agent, therefore the United Kingdom joint anaesthetic and gastroenterology guidelines recommend that propofol administration for complex endoscopic procedures should be the responsibility of dedicated anaesthetists only[4]. Demand for EUS in the United Kingdom is increasing and as a consequence, it is not feasible for all EUS procedures to be performed with anaesthesiologist administration. The vast majority are carried out using combination opiate and benzodiazepine sedation. Although a number of studies have sought to assess tolerability of gastroscopy and colonoscopy with benzodiazepine and opiate sedation[5-7] this has rarely included EUS[8,9]. EUS procedures take longer and use larger diameter endoscopes (13.8-14.6 mm) compared to conventional oesophago-gastroduodenoscopy (OGD) (9.9-10.2 mm). It is important to ensure that EUS tolerability is acceptable. We prospectively examined outcomes in a single EUS centre in the United Kingdom to assess if the tolerability of sedated EUS was comparable to sedated OGD.

Consecutive patients undergoing EUS or OGD with sedation (either midazolam and or fentanyl) were prospectively identified with a 1:1 enrolment ratio. After being counselled and consented, patients were asked to complete pre and post procedure questionnaires. A visual analogue scale (0-10) was used to record patients' expected pain pre-procedure and the actual pain perceived post-procedure. Subsequent willingness to repeat the procedure was also noted. Procedure duration and sedation dosages were recorded for each patient. Sedation complications were regarded as use of intravenous reversal agents and or assisted ventilation. Fisher's test was used to generate *P* values comparing the means of groups for age, duration, drug doses and pain scores. Unpaired *t*-test was used to calculate *P* values for willingness to have a repeat procedure.

Table 1 Comparison of patients undergoing sedated endoscopic ultrasound and oesophago-gastroduodenoscopy procedures *n* (%)

	OGD *n* = 100	EUS *n* = 100	*P* value
Age, yr (range)	52.5 (17-85)	63 (22-90)	
Female	69	53	-
Median duration minutes (range)	6 (2-33)	15 (6-38)	$P < 0.0001$
Average midazolam mg (range)	3 (1-15)	4 (1-8)	$P = 0.001$
Average fentanyl mcg (range)	75 (50-150)	100 (25-200)	$P < 0.0001$
Procedures using fentanyl and midazolam	6%	67%	$P < 0.0001$
Mean expected pain 1-10 (SD)	3.47 (2.80)	3.37 (2.70)	$P = 0.46$
Mean actual pain 1-10 (SD)	1.88 (2.61)	1.16 (1.99)	$P = 0.03$
Would you have the test again?	87	94	$P = 0.15$
Complications recorded	0	0	-

OGD: Oesophago-gastroduodenoscopy; EUS: Endoscopic ultrasound.

Two hundred consecutive patients undergoing either OGD (100) or EUS (100) were recruited (Table 1). All procedures were completed and no significant difference in expected pain scores between the OGD and EUS groups were observed ($P = 0.46$). EUS procedures lasted significantly longer than OGDs (15 min *vs* 6 min, $P < 0.0001$) and used significantly higher doses of both midazolam ($P = 0.001$) and fentanyl ($P < 0.0001$). Patients undergoing EUS were significantly more likely to receive fentanyl and midazolam in combination compared to those having ODG (67% *vs* 6%, $P < 0.0001$). Despite the increased procedure time in the EUS group, the sedation used resulted in significantly lower pain scores for EUS compared to OGD (1.16/10 *vs* 1.88/10, $P = 0.03$). Assisted ventilation was not required and no intravenous sedation reversal agents were used in either group.

In conclusion, although propofol has been shown to be a superior sedation agent the mandatory anaesthetic support required in the United Kingdom makes its unfeasible to be used for all EUS procedures. We feel our study demonstrates that the tolerability of EUS with opiate and benzodiazepine sedation is acceptable.

REFERENCES

1 **Cheriyan DG**, Byrne MF. Propofol use in endoscopic retrograde cholangiopancreatography and endoscopic ultrasound. *World J Gastroenterol* 2014; **20**: 5171-5176 [PMID: 24833847 DOI: 10.3748/wjg.v20.i18.5171]

2 **Fatima H**, DeWitt J, LeBlanc J, Sherman S, McGreevy K, Imperiale TF. Nurse-administered propofol sedation for upper endoscopic ultrasonography. *Am J Gastroenterol* 2008; **103**: 1649-1656

[PMID: 18557709 DOI: 10.1111/j1572-0241.2008.01906.x]

3 **Nayar DS**, Guthrie WG, Goodman A, Lee Y, Feuerman M, Scheinberg L, Gress FG. Comparison of propofol deep sedation versus moderate sedation during endosonography. *Dig Dis Sci* 2010; **55**: 2537-2544 [PMID: 20635148 DOI: 10.1007/s10620-010-1308-0]

4 **Tomlinson A**, Green J, Cairns SR, Cressey D, Smith, I, Peacock J. Guidance for the use of propofol sedation for adult patients undergoing Endoscopic Retrograde Cholangiopancreatography (ERCP) and other complex upper GI endoscopic procedures. On behalf of the Joint Royal College of Anaesthetists (RCoA) and British Society of Gastroenterology (BSG) Working Part. Available from: URL: http://www.bsg.org.uk/clinical-guidance/endoscopy/guidance-for-the-use-of-propofol-sedation-for-adults-undergoing-endoscopic-retrograde-cholangiopancreatography-ercp.html

5 **Ko HH**, Zhang H, Telford JJ, Enns R. Factors influencing patient satisfaction when undergoing endoscopic procedures. *Gastrointest Endosc* 2009; **69**: 883-891, quiz 891.e1 [PMID: 19152911 DOI: 10.1016/j.gie.2008.06.024]

6 **Peña LR**, Mardini HE, Nickl NJ. Development of an instrument to assess and predict satisfaction and poor tolerance among patients undergoing endoscopic procedures. *Dig Dis Sci* 2005; **50**: 1860-1871 [PMID: 16187188 DOI: 10.1007/s10620-005-2952-7]

7 **Salmon P**, Shah R, Berg S, Williams C. Evaluating customer satisfaction with colonoscopy. *Endoscopy* 1994; **26**: 342-346 [PMID: 8076565 DOI: 10.1055/s-2007-1008988]

8 **Dewitt J**, McGreevy K, Sherman S, Imperiale TF. Nurse-administered propofol sedation compared with midazolam and meperidine for EUS: a prospective, randomized trial. *Gastrointest Endosc* 2008; **68**: 499-509 [PMID: 18561925 DOI: 10.1016/j.gie.2008.02.092]

9 **Mortensen MB**, Fristrup C, Holm FS, Pless T, Durup J, Ainsworth AP, Nielsen HO, Hovendal C. Prospective evaluation of patient tolerability, satisfaction with patient information, and complications in endoscopic ultrasonography. *Endoscopy* 2005; **37**: 146-153 [PMID: 15692930 DOI: 10.1055/s-2005-861142]

P- Reviewer: Corrales FJJ, Fargion S, Morales-Ruiz M
S- Editor: Qi Y **L- Editor**: A **E- Editor**: Liu WX

Published by **Baishideng Publishing Group Inc**
8226 Regency Drive, Pleasanton, CA 94588, USA
Telephone: +1-925-223-8242
Fax: +1-925-223-8243
E-mail: bpgoffice@wjgnet.com
Help Desk: http://www.wjgnet.com/esps/helpdesk.aspx
http://www.wjgnet.com

ISSN 1007-9327

9 771007 932045 03>