Intranasal sufentanil combined with intranasal dexmedetomidine: A promising method for non-anesthesiologist sedation during endoscopic ultrasonography

Yong Wang, Zhi-Jun Ge, Chao Han

Abstract

Intranasal sufentanil combined with intranasal dexmedetomidine exhibited an estimated sedation success probability as high as 94.9%, higher satisfaction scores, and only minor adverse events, thus highlighting a promising method for EUS sedation in the absence of an anesthesiologist.

Key Words: Intranasal; Sufentanil; Dexmedetomidine; Sedation; Endoscopic Ultrasonography
TO THE EDITOR

We read with interest the paper published by Zou et al.[1] exploring the ED95 of intranasal sufentanil (SUF) combined with intranasal dexmedetomidine (DEX) for moderate sedation during endoscopic ultrasonography (EUS). EUS has been widely used clinically due to its unique diagnostic value regarding lesions arising from the pancreas, upper gastrointestinal tract, as well as adjacent structures, such as the liver and lymph nodes[2-4]. However, EUS procedures take a long time and use a larger and stiffer probe compared to conventional endoscopes. Thus, it is important that we ensure that EUS tolerability is acceptable.

In patients undergoing complex endoscopic procedures, the current standard of practice is to administer sedative medication intravenously. Propofol-based sedation has become the first choice for endoscopic sedation over the last two decades because of its fast onset of action and short half-life[5,6]. Although there is compelling evidence to support the quality, cost effectiveness, and safety profile of the administration of propofol for EUS in the absence of an anesthesiologist[7,8], it is currently recommended that the administration and monitoring of propofol sedation for endoscopic procedures should be the responsibility of a dedicated and appropriately trained anesthetist only. A joint position statement endorsed by the British Society of Gastroenterology, the Joint Advisory Group, and the Royal College of Anesthetists highlights the role of anesthetist-led deep sedation practice with a focus on propofol sedation[9]. This is because propofol can produce serious and potentially fatal side effects such as hypotension, bradycardia, hypoventilation, hypoxemia, and even apnea. Therefore, propofol-independent sedation regimens have received increasing attention since such regimens could avoid the controversy related to non-anesthesiologist-administered propofol sedation[10,11].

Here, the paper proposed a promising and alternative regimen for non-anesthesiologist propofol administration during EUS, despite the authors’ original intention not to do so. Intranasal administration offers a noninvasive, rapid, and efficient route for drug delivery with stable hemodynamics compared to the intravenous route due to a slower and more gradual onset. The authors made ingenious use of the pharmacokinetic characteristics of SUF and DEX. Intranasal 1 μg/kg DEX was administered 45 min before EUS and intranasal 0.3 μg/kg SUF was administered 20 min later, ensuring that the two drugs achieved peak effect during the procedure[12,13]. Sequential intranasal therapy exhibited an estimated sedation success probability that reached 94.9%, higher satisfaction scores, and minor adverse events. The emerging sedation regimen makes it possible to administer EUS sedation without an anesthesiologist and has high clinical significance. However, there are still several issues that need to be discussed with the authors before this technology is popularized. The modified observer’s assessment of alert (MOAA/S) scale is generally classified as deep sedation (0 to 1), moderate sedation (2 to 3) and slight sedation (4 to 5)[14,15]. However, the authors defined a successful moderate sedation as a score ≤ 3 on the MOAA/S a scale; this would mean that deep sedation (MOAA/S: 0 to 1) into the category of moderate sedation. Although deep sedation does not mean oversedation, this might be more understandable if the authors could clarify the difference between moderate sedation and oversedation. In addition, the paper does not describe the MOAA/S scores of patients throughout their procedures. The authors acknowledged the presence of fluctuating levels of sedation although the use of rescue sedation was not reported. Insufficient or excessive sedation will inevitably lead to complications and may cause readers to worry about the safety of this technique.

Another issue worth noting is that the authors did not describe the time elapsed from the onset of sedation to discharge, and according to the pharmacokinetics of SUF and DEX, the maintenance time for both drugs is approximately 2 h[12,13]. Conversely, the average procedure time in this study was only 30 min, indicating that patients remained under sedation for 1 h after the completion of EUS. This might delay recovery when compared with the established protocol involving propofol sedation. We hope that the authors will provide relevant data to answer these concerns.

In our opinion, the most significant problem with this novel technology is the feasibility of clinical promotion. The sedation preparation prior to EUS took 45 min in this study. Transnasal medication also requires medical monitoring, thus increasing the occupation of medical resources and causing delays in the procedure, especially in outpatients. A separate induction room and complete service flow are prerequisites for the application of this new sedation regimen. Furthermore, as the article mentioned, the study was performed in patients with a normal body mass index (BMI). This would exclude the occurrence of serious respiratory depression in those with a high BMI.

Citation: Wang Y, Ge ZJ, Han C. Intranasal sufentanil combined with intranasal dexmedetomidine: A promising method for non-anesthesiologist sedation during endoscopic ultrasonography. World J Clin Cases 2022; 10(23): 8428-8431.

URL: https://www.wjgnet.com/2307-8960/full/v10/i23/8428.htm
DOI: https://dx.doi.org/10.12998/wjcc.v10.i23.8428
To conclude, we believe that the authors provided a promising regimen for non-anesthesiologist sedation during EUS even if sedation levels fluctuated throughout the study period. Nevertheless, further studies are now needed to confirm the safety profile of this technique in different populations.

### FOOTNOTES

**Author contributions:** Wang Y and Ge ZJ designed and performed the research; Han C wrote and revised the letter.

**Conflict-of-interest statement:** All authors have no conflicts of interest to declare.

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**S-Editor:** Wang LL

**L-Editor:** Filipodia

**P-Editor:** Wang LL

### REFERENCES

1. **Zou Y**, Li N, Shao LJ, Liu FK, Xue FS, Tao X. Determination of the ED$_{50}$ of intranasal sufentanil combined with intranasal dexmedetomidine for moderate sedation during endoscopic ultrasonography. *World J Clin Cases* 2022; 10: 2773-2782 [PMID: 35434908 DOI: 10.12998/wjcc.v10.i9.2773]

2. **Su Q**, Peng J, Chen X, Xiao Z, Liu R, Wang F. Role of endoscopic ultrasonography for differential diagnosis of upper gastrointestinal submucosal lesions. *BMC Gastroenterol* 2021; 21: 365 [PMID: 34620107 DOI: 10.1186/s12876-021-01945-9]

3. **Tanaka H**, Matsuhashi S. The Utility of Endoscopic-Ultrasoundography-Guided Tissue Acquisition for Solid Pancreatic Lesions. *Diagnostics (Basel)* 2022; 12 [PMID: 35328306 DOI: 10.3390/diagnostics12030753]

4. **De Lisi S**, Giovanni M. Endoscopic ultrasonography: Transition towards the future of gastro-intestinal diseases. *World J Gastroenterol* 2016; 22: 1779-1786 [PMID: 26855537 DOI: 10.3748/wjg.v22.i5.1779]

5. **Qin Y**, Chen S, Zhang Y, Liu W, Lin Y, Chi X, Chen X, Yu Z, Su D. A Bibliometric Analysis of Endoscopic Sedation Research: 2001-2020. *Front Med (Lausanne)* 2021; 8: 775495 [PMID: 35047526 DOI: 10.3389/fmed.2021.775495]

6. **Teh JL**, Shabbir A, Yuen S, So JB. Recent advances in diagnostic upper endoscopy. *World J Gastroenterol* 2020; 26: 433-447 [PMID: 32063692 DOI: 10.3748/wjg.v26.i4.433]

7. **Fatima H**, DeWitt J, LeBlanc J, Sherman S, McGreery K, Imperiale TF. Nurse-administered propofol sedation for upper endoscopic ultrasonography. *Am J Gastroenterol* 2008; 103: 1649-1656 [PMID: 18557709 DOI: 10.1111/j.1572-0241.2008.01906.x]

8. **Redondo-Cerezo E**, Sánchez-Robaina A, Martínez Cara JG, Ojeda-Hinojosa M, Matas-Cobos A, Sánchez Capilla AD, López de Hierro Ruiz M, Plegueaule-Díaz J, de Teresa J. Gastroenterologist-guided sedation with propofol for endoscopic ultrasonography in average-risk and high-risk patients: a prospective series. *Eur J Gastroenterol Hepatol* 2012; 24: 506-512 [PMID: 22330236 DOI: 10.1097/MEG.0b013e32835f6c06]

9. **Sidhu R**, Turnbull D, Newton M, Thomas-Gibson S, Sanders DS, Hebbar S, Haidry RJ, Smith G, Webster G. Deep sedation and anaesthesia in complex gastrointestinal endoscopy: a joint position statement endorsed by the British Society of Gastroenterology (BSG), Joint Advisory Group (JAG) and Royal College of Anaesthetists (RCoA). *Frontline Gastroenterol* 2019; 10: 141-147 [PMID: 31205654 DOI: 10.1136/flgastro-2018-101145]

10. **Guimaraes ES**, Campbell EJ, Richter JM. The safety of nurse-administered procedural sedation compared to anesthesia care in a historical cohort of advanced endoscopy patients. *Anesth Analg* 2014; 119: 349-356 [PMID: 24859079 DOI: 10.1213/ANE.0000000000002558]

11. **Perel A**. Non-anesthesiologists should not be allowed to administer propofol for procedural sedation: a Consensus Statement of 21 European National Societies of Anaesthesia. *Eur J Anaesthesiol* 2011; 28: 580-584 [PMID: 21705907 DOI: 10.1097/EJA.0b013e32834a977]

12. **Weerink MAS**, Struys MMRF, Hannivoort LN, Barends CRM, Absalom AR, Colin P. Clinical Pharmacokinetics and Pharmacodynamics of Dexmedetomidine. *Clin Pharmacokinet* 2017; 56: 893-910 [PMID: 28105598 DOI: 10.1007/s40262-016-0507-7]

13. **Helmers JH**, Noorduin H, Van Peer A, Van Leeuwen L, Zuurmond WW. Comparison of intravenous and intranasal sufentanil absorption and sedation. *Can J Anaesth* 1989; 36: 494-497 [PMID: 2529048 DOI: 10.1007/BF03005373]

14. **Gan TJ**, Berry BD, Ekman EF, Muckerman RC 2nd, Shore N, Hardi R. Safety evaluation of fospropofol for sedation
during minor surgical procedures. *J Clin Anesth* 2010; **22**: 260-267 [PMID: 20522356 DOI: 10.1016/j.jclinane.2009.08.007]

15 Pastis NJ, Hill NT, Yarmus LB, Schippers F, Imre M, Sohngen W, Randall O, Callahan SP, Silvestri GA. Correlation of Vital Signs and Depth of Sedation by Modified Observer's Assessment of Alertness and Sedation (MOAA/S) Scale in Bronchoscopy. *J Bronchology Interv Pulmonol* 2022; **29**: 54-61 [PMID: 34238838 DOI: 10.1097/LBR.0000000000000784]
