

Periprocedural Role of Nurses During Interventional Endoscopic Procedures Under Deep Sedation

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ABSTRACT: Background. Most of endoscopic procedures, either diagnostic or therapeutic, are nowadays performed under sedation, used as a standard practice in most of the centers. Consequently, the number and complexity of endoscopic procedures has increased as sedation diminishes anxiety and discomfort for patients, also improving the quality of endoscopic examinations, and outcomes in therapeutic endoscopy. Compared to standard diagnostic upper or lower GI endoscopy, endoscopic ultrasound (EUS) and endoscopic retrograde cholangiopancreatography (ERCP) are often longer and more complicated procedures, thus requiring higher doses of sedatives. Sedation levels and medication types depend on a variety of factors, related both to patient characteristics (age, comorbidities, preference, etc.), and procedure types (simple diagnostic endoscopy or more complex therapeutic procedures). Propofol has become undoubtedly the induction agent of choice as it is easy to administer, enables prompt awakening, and has fewer side effects. Aim. The aim of this paper is to outline the role and efficacy of the endoscopy nurse in the peri-procedural care of patients undergoing complex therapeutic interventions (EUS-guided and/or ERCP) under propofol sedation. Methods. At our institution, the Research Centre of Gastroenterology and Hepatology Craiova, 192 patients underwent interventional endoscopic procedures between January 2014-December 2014 (130 EUS and 62 ERCP) under sedation with propofol. We included 110 patients in our study that were followed-up between 4 to 6 hours after the procedures. The GI nurse was responsible that the patients and/or their accompanying persons receive proper information in both written and spoken form regarding their procedure and potential adverse events after sedation. After the procedures the side effects related to anesthesia were marked down by the GI nurse based on a standard questionnaire. Results. The patients mean age was 53.5 years old, with 46 (41.8%) women and 64 (58.2%) men. Most of the patients, that is 90 (81.8%), presented no adverse events. The other 20 patients (18.2%) had the following side effects from sedation: drowsiness in 5 (4.5%) of the cases, nausea in 3 cases (2.8%), vomiting in one case (0.9%), 2 (1.8%) of the patients presented dizziness, 2 (1.8%) headache, 3 (2.8%) coughing, only one patient (0.9%) had an injection site reaction, one (0.9%) had shivers, and 2 patients (1.8%) presented bradycardia. Patients that had side effects were mainly of advanced age and with associated diseases which included chronic kidney disease, cardio-vascular diseases. The nurse responsible with the follow-up of patients was able to rapidly assess their complaints and intervene to the benefit of the patient, before serious adverse events could occur. Conclusions. Although propofol sedations is generally considered safe, potential side effects should be held in mind. The GI nurse has a valuable role in monitoring patients and assessing their response to sedation after the procedure, as well as in timely stepping in where necessary to prevent further complications.

KEYWORDS: deep sedation, propofol, interventional endoscopy, nursing

Introduction

Most of diagnostic and therapeutic endoscopic procedures are currently performed under sedation, used as a daily routine practice in most of the centers [1,2]. Consequently, the number and complexity of endoscopic procedures has increased as sedation diminishes anxiety and discomfort for patients, also improving the quality of endoscopic examinations, and outcomes in therapeutic endoscopy [1-3].

Compared to standard diagnostic upper or lower gastrointestinal (GI) endoscopy, endoscopic ultrasound (EUS) and endoscopic retrograde cholangiopancreatography (ERCP) are often longer and more complicated

procedures, thus requiring higher doses of sedatives.

Sedation levels and medication types depend on a variety of factors, related both to patient characteristics (age, comorbidities, preference, etc.), and procedure types (simple diagnostic endoscopy or more complex therapeutic procedures). Propofol has become undoubtedly the induction agent of choice as it is easy to administer, enables prompt awakening, and has fewer side effects [3,4]. Moreover, non-anesthesiologist (nurse) administered propofol sedation (NAPS) has been increasingly used, especially for advanced endoscopy, including ERCP, EUS and enteroscopy [5,6]. Adequate assessment tools to assess the skills required for NAPS used during endoscopic

procedures have been developed to improve safety and reliability of the procedures [7].

The aim of this paper is to outline the role and efficacy of the endoscopy nurse in the peri-procedural care of patients undergoing complex therapeutic interventions (EUS-guided and/or ERCP) under intermittent deep propofol sedation.

Material and methods

The study included 192 patients that underwent interventional endoscopic procedures between January 2014-December 2014 (130 EUS and 62 ERCP) under sedation with propofol, at the Research Centre of Gastroenterology and Hepatology, University of Medicine and Pharmacy Craiova, Romania. From the total number of patients, 110 patients received only intermittent deep propofol sedation, without any other complementary medication.

Adverse events during the procedures were defined as oxygen saturation $<92\%$ (hypoxia), a drop in mean arterial pressure of $>30\%$ or a drop in systolic blood pressure of $>50\text{mmHg}$ (hypotension). The overall rate of hypoxia and hypotension were recorded, as well as the patients that needed assisted ventilation according to their age, American Society of Anesthesiologists (ASA) classification and total propofol dose.

The patients were followed-up between 4 to 6 hours after the procedures. The gastroenterology nurse was responsible that the patients and/or their accompanying persons receive proper information in both written and

spoken form regarding their procedure and potential adverse events after sedation. After the procedures, the side effects related to anesthesia were marked down by the gastroenterology nurse based on a standard questionnaire inspired after the questionnaire of Hutchings et al [8]. It included 15 questions regarding several aspects, the most important being: the amount of explanation about the procedure before endoscopy, discomfort during and after endoscopy, pain during and after endoscopy, technical skills of the endoscopist, overall satisfaction.

An important aspect for the patients to accept the advanced procedures was related to the opportunity of being sedated during the procedure.

Results

A total number of 110 patients was included in the study, with the patients mean age of 53.5 years old, with 46 (41.8%) women and 64 (58.2%) men.

During the procedures several adverse events have been recorded by the anesthesiology team (Fig.1), including short duration hypoxia in 4 patients (3.6%), need to suction secretions in 7 patients, (6.4%) or need for bag mask ventilation in 1 patient (0.9%). A drop in systolic blood pressure has been recorded in only 2 patients (1.8%), as well as mild bradycardia in 2 patients (1.8%). Only one procedure (0.9%) had to be discontinued, with the patient requiring anesthesia support and orotracheal intubation.

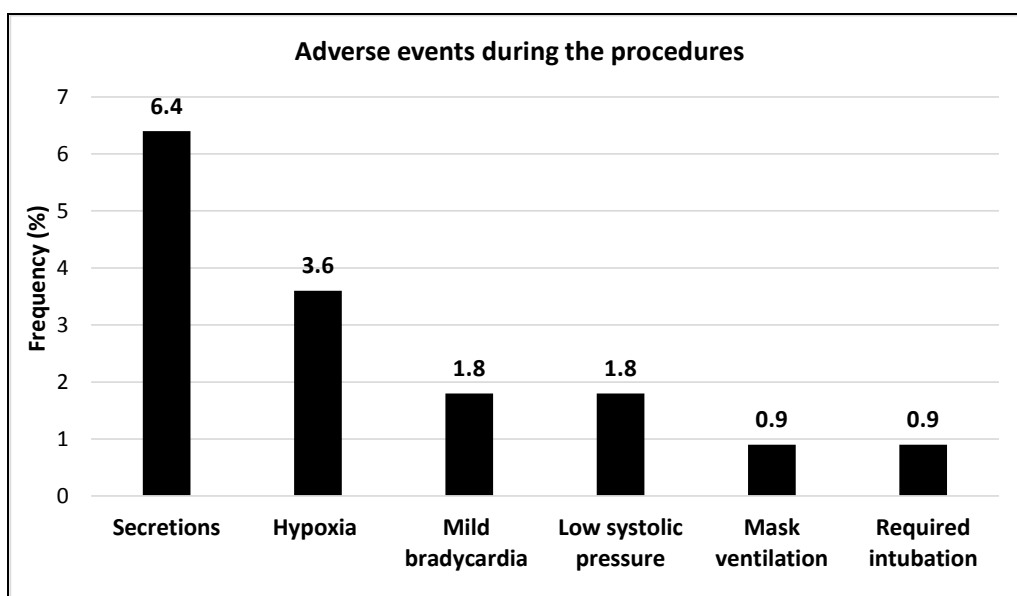


Fig.1. The incidence of adverse events during the endoscopic procedures

A total number of 90 patients (81.8%), presented no adverse events after the procedure. The other 20 patients (18.2%) had the following side effects from sedation (Fig.2): drowsiness in 5 patients (4.5%), nausea in 3 patients (2.8%), vomiting in one patient (0.9%). Also, 2 of the

patients (1.8%) presented dizziness, 2 (1.8%) headache, 3 (2.8%) coughing, only one patient (0.9%) had an injection site reaction, one (0.9%) had shivers, and 2 patients (1.8%) presented mild bradycardia.

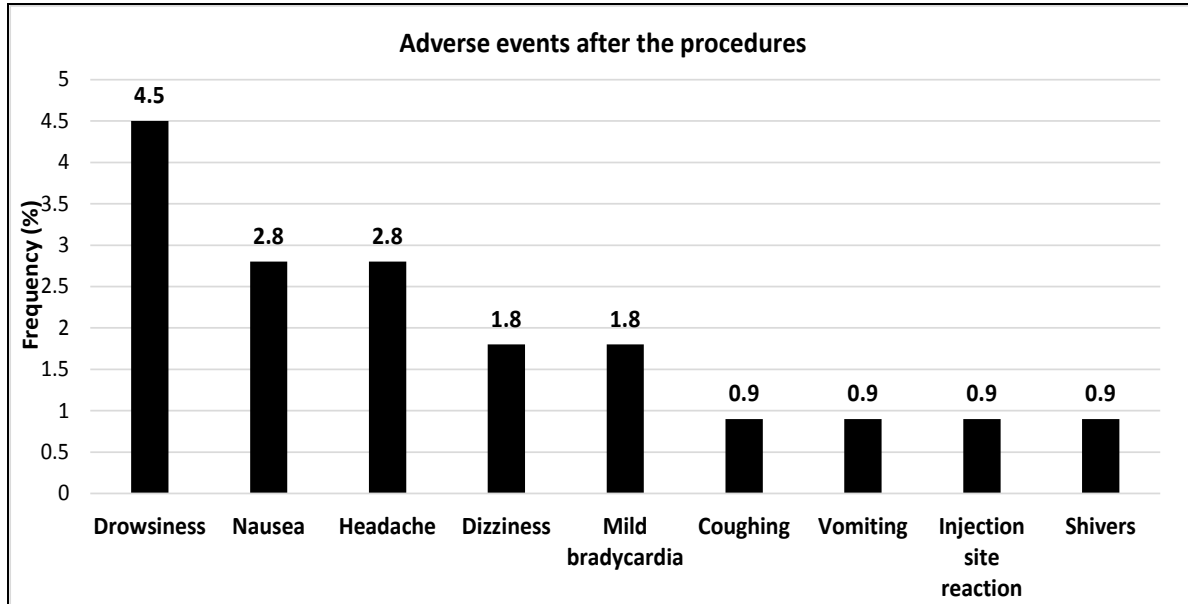


Fig.2. The incidence of adverse events after the endoscopic procedures

Patients that had side effects were mainly of advanced age and with associated diseases which included cardio-vascular diseases, diabetes and chronic kidney disease. These underlying pathologies could explain the higher

separate incidence of low systolic pressure, mild bradycardia, hypoxia and lung secretion in excess during EUS and interventional EUS (Fig.3).

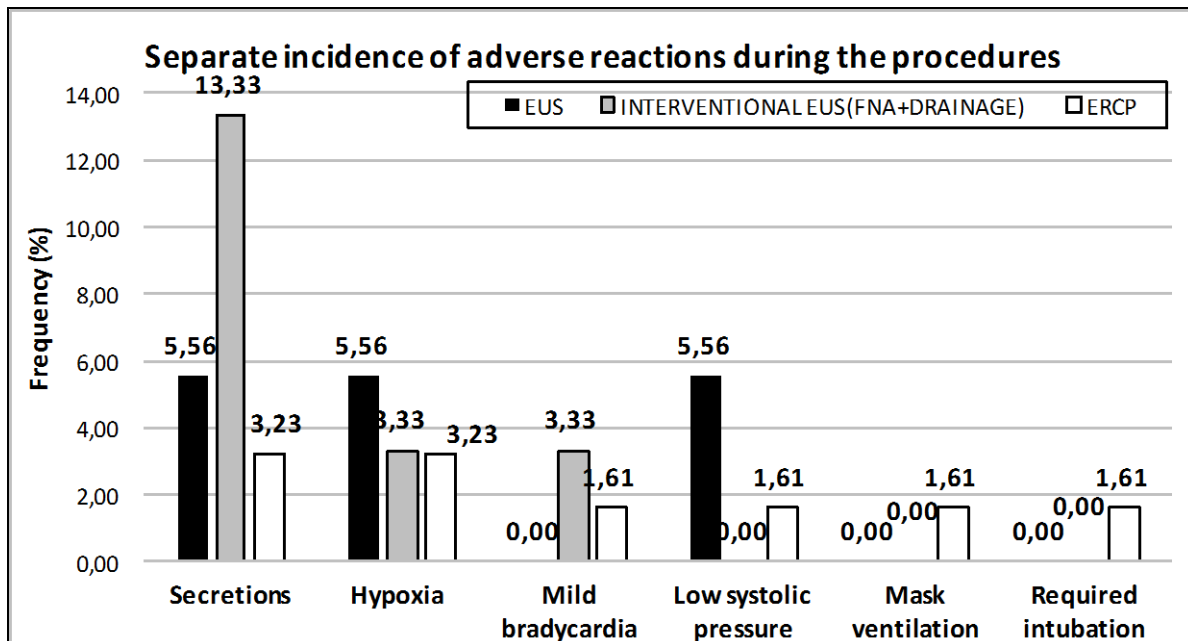


Fig.3. The separate incidence of adverse reactions during the endoscopic procedures

The nurse responsible with the follow-up of patients was able to rapidly assess their complaints and intervene to the benefit of the patient, before serious adverse events could occur. Hence, the separate incidence of adverse

reactions after the procedures revealed a higher incidence of mild events as drowsiness, headache, coughing especially after EUS and interventional EUS (Fig.4).

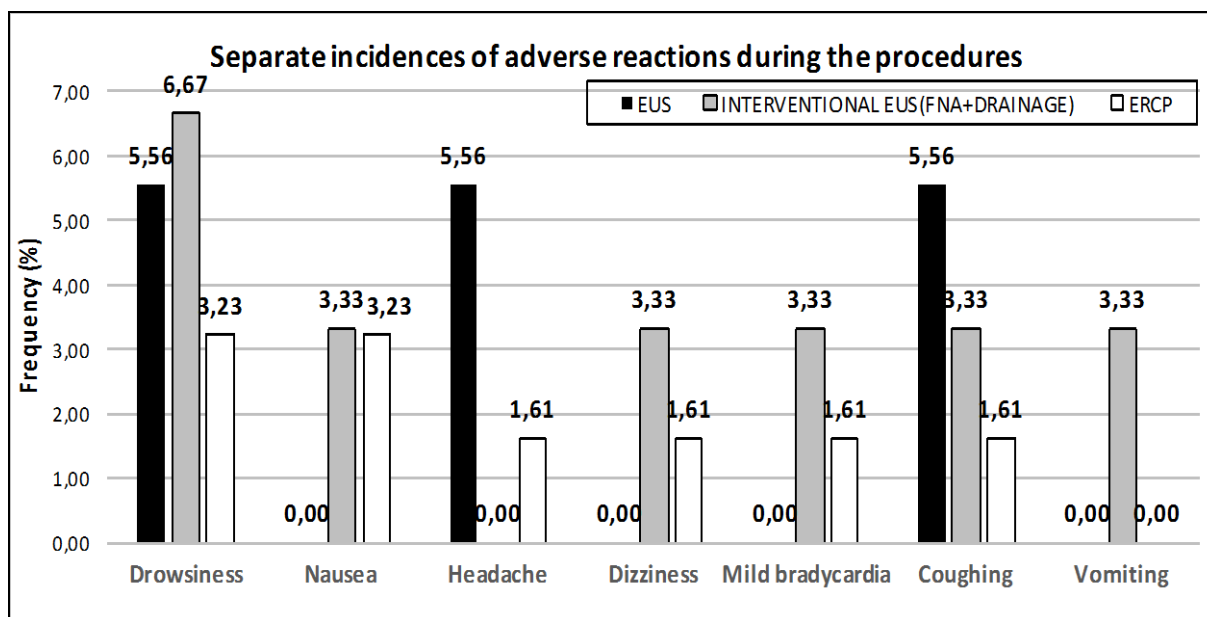


Fig.4. The separate incidence of adverse reactions after the endoscopic procedures

Discussions

Sedation in gastrointestinal endoscopy is increasingly used mainly because it enhances the quality of endoscopic examinations and the procedural success, and because it also increases the favorable outcome in complex procedures, including endoscopic ultrasound (EUS) and endoscopic retrograde cholangiopancreatography (ERCP) [1,9]. Most of the current guidelines recommend the use of propofol based sedation [10-13]. Nevertheless, as these procedures usually require a deeper sedation level, the risk of adverse events is also higher [14]. Consequently, there is a certainty for vital signs monitoring during the endoscopic procedures, including advanced monitoring (e.g. respiratory monitoring, capnography, etc.) especially for patients with advanced age and high American Society of Anesthesiologists (ASA) physical status score [15].

A dedicated team of trained nurses or endoscopists should work in a tertiary healthcare environment in order to manage safely complex diagnostic and therapeutic endoscopic procedures like ERCP and EUS. Recent studies that compared non-anesthesiologist administered propofol (NAAP) sedation with anesthesiologist

administered propofol (AAP) sedation and showed the same rates of adverse events, including hypoxia and airway intervention [16]. Our data also showed that a combined team of anesthesiologists and dedicated nurses helped to maintain a very low incidence of adverse events, with only one of the endoscopic advanced procedures that had to be discontinued.

Newer techniques like computer assisted propofol sedation (CAPS) are now approved for moderate sedation in ASA I and II patients undergoing routine endoscopy, whilst they allow an efficient and safe method of sedation. Furthermore, both patient and endoscopists degree of satisfaction were higher for CAPS compared to conventional midazolam and fentanyl sedation, with a lower rate of adverse events [17].

Conclusion

Although propofol sedation is generally considered safe, potential side effects should be held in mind. The dedicated gastroenterology nurse has a valuable role in monitoring patients and assessing their response to sedation during and/or after the procedure, as well as in timely stepping in where and when necessary to prevent further complications.

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