Nurse-Administered Propofol Sedation in Nonagerians: Extending the Panacea

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The rising patient demographics in the aging population worldwide are reflected in the increasing use of endoscopy to manage gastrointestinal (GI)-related clinical problems. These age-related disorders include cancer, biliary tract disease, feeding issues, or GI ischemia [1]. Compared to other age groups, sedation during endoscopy in the advanced age presents a major challenge, the primary concern being the safety window given that these patients have poor physiological reserve as well as other associated comorbidities.

When sedating the aged, issues of health remain, thereby questioning the risks and benefits involved. Cardiopulmonary risks include poor response of heart rate to hypotension, reduced ventilatory response to hypoxia and hypercarbia resulting in apnea, impairments in thermoregulation and water balance resulting in increased vulnerability to hypovolemia and hypothermia [2]. Similarly, changes in volume of distribution and bioavailability coupled with limited renal and hepatic clearance alter the pharmacodynamics of drugs. This results in heightened sensitivity to sedative agents necessitating dose titration and interval duration modifications [3, 4]. Other concerns include increased risk of aspiration, postprocedure delirium and prolonged recovery times. Therefore, the choice of safe sedative agents becomes important given the fact that most of the endoscopic procedures aim for a continuum of minimal to moderate sedation. This

is more relevant when nonanesthesiologists are involved in its administration.

The growing use of propofol (2,6 diisopropyl phenol) as a safe sedative agent during GI endoscopy in the setting of nurse-administered propofol (NAPS) or otherwise termed as gastroenterologist directed propofol has been gaining acceptance in the GI community globally. Propofol has advantages of quick onset, favorable pharmacodynamics, mild antiemetic properties, rapid termination of effect and expedited recovery [2]. Several landmark studies have been published establishing its safety and advantage over other sedative agents [5, 6]. A recent worldwide multicentric survey of NAPS included more than 521,000 patients. Mask ventilation rates were 0.4:1,000 patients for upper endoscopy and 0.1:1,000 patients for colonoscopy. Endotracheal intubations, neurologic injuries, and death occurred in 4, 1, and 3 patients, respectively. The 3 patients that died had significant comorbid illnesses such as widely metastatic malignancy and polysubstance abuse [7, 8].

Owing to its narrow therapeutic margin of index, propofol sedation especially in the elderly needs special attention. Heuss et al. [9] addressed this issue earlier in a prospective study of conscious sedation for propofol in elderly patients. Compared with younger patients, there was a significant increase in risk for a short oxygen desaturation <90% and a decrease in oxygen saturation

>5%. Arterial hypotension occurred significantly more often in the control group than among the aged patients concluding the safety of administration even in the age group >85 years. Riphaus et al. [10] studied the safety of propofol compared to midazolam/meperidine in high-risk octogenarians undergoing complex therapeutic endoscopic procedures as ERCP. Clinically relevant vital signs such as oxygen desaturation and hypotension were comparable and propofol provided significantly better patient cooperation, shorter recovery times and higher recovery scores reflecting its shorter half-life.

The present study by Horiuchi and colleagues published in this journal enrolled 241 patients (aged >90 years) who underwent routine endoscopic procedures including PEG placement and ERCP under propofol sedation. The design was prospective with bolus administration of propofol by a trained endoscopy team consisting of the physician and two nurses. There were more patients with ASA score of III than I/II. The authors aimed for moderate sedation with low doses of propofol ranging from 22 to 42 mg, depending on the respective procedure involved. Though the study did not compare between other sedative agents, it clearly showed the safe profile of propofol with no severe adverse cardiopulmonary events. The study has limitations of assessing the level of sedation in all patients as well as postprocedural recovery period due to cognitive impairment in some of the patients. Also, there were 7/241 patients who developed deep sedation. Supplemental use of oxygen was not used routinely in these patients.

Given the above data, safe sedation using propofol in the advanced age group is a practical reality. However, prior to endoscopy, careful individual assessment is important for each patient while selecting them in their fragile age. The treating physician should record their cognitive function, discuss the options of sedation with the patient and/or relatives, whichever deemed necessary, and get an informed consent [11]. Low dose with careful titration, intense pre-, intra- and postprocedural monitoring, and liberal use of oxygen supplementation will go a long way in a well-relaxed elderly patient resulting in the best endoscopic outcomes.

The future of NAPS in the elderly will focus on well-framed guidelines by individual endoscopic societies. Further studies will bring out the advantages of capnography, roles of bispectral index monitoring, patient controlled or computer-assisted sedation, use of newer agents such as fospropofol disodium, thereby crossing boundaries into the geriatric age group. The trend to add a combination regimen or balanced anesthesia for lowering the dose of propofol in addition to anxiolysis as against a single regimen is still debatable [12, 13]. While lobbying with regulatory boards, armed with abundant data for endoscopic propofol sedation by nonanesthesiologists, the caveat still underscores the importance of an adequately well-trained integrated gastroenterologist directed propofol sedation team. Finally, in the effective approach to proper practice of sedation and care for the elderly brings to my mind: *'Wrinkles should merely indicate where smiles have been'* – Mark Twain.

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