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Research Article

Endoscopy without Sedation less Time in the Recovery Unit Post-Procedure

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Abstract

Background In this study, we compared the length of time in the recovery room following endoscopic procedures with and without sedation and looked for any differences in pain scores that were statistically significant.

Methods Retrospective study, which was taken from the patient's records in the recovery unit, with a sample of 200 patients.

Result Regarding the sociodemographic data the mean age was 60.5 years old generally, with 108 males (54%), and 92 females (46%. Regarding the type of sedation, 50 patients had OGD with no sedation (25%), and 50 had it with sedation (25%). 50 patients had colonoscopy with only fentanyl (25%), and 50 had it with both fentanyl and midazolam (25%). Regarding the dose range of fentanyl,100 patients had it, 97 between 25-50 mcg and 3 patients had more than 50 mcg, for the dose of midazolam, 100 patients had it, 95 patients had between 1.5-3.0 mg, 5 had between 4-5 mg. The LOS (min) 99 patients had more than 120 minutes (49.5%), 58 between 61-120 (29%), and 43 between 9-60 minutes (21.5%) in the recovery unit.

Conclusion This study has concluded that most of the patients who have had endoscopy with sedation had a prolonged time in recovery compared to patients who didn't have sedation and had a lower time in recovery. For colonoscopy, most of the patients had a longer time when using both midazolam and fentanyl compared to those who had only fentanyl, which indicates that using midazolam increases the time in recovery. The higher the dose of sedation the more time in the recovery post-endoscopy. There was no significant difference in pain score in colonoscopy with sedation or without.

Abbreviations: OGD: Oesophagogastroduodenoscopy; GI: Gastrointestinal; ERCP: Endoscopic Retrograde Cholangiopancreatography; GERD: Gastroesophageal Reflux Disease; PEG: Percutaneous Endoscopic Gastrostomy; ACS: The American Cancer Society; WHO: World Health Organization; USPSTF: US Preventive Services Task Force; AGA: American Gastroenterological Association; ACP: American College of Physicians; FOBT: Faecal Occult Blood Testing; FIT: Faecal Immunohistochemistry Testing; CT: Computed Tomography; EUS: Endoscopic Ultrasonography; Midaz: Midazolam; LOS: length of stay

Introduction

The use of endoscopy in the diagnosis and treatment of gastrointestinal disorders (GI) is common. In some cases, fear and anxiety related to anticipated discomfort of the procedure can affect patient willingness to undergo endoscopy and may negatively impact the endoscopist's ability to perform the procedure. [1] The use of sedation for routine endoscopic procedures varies widely across the world, there is wide variability in the use of sedation during routine endoscopic procedures across countries [2]. In the United States, more than 98% of OGDs and colonoscopies are done under sedation [3]. European countries, on the other

hand, perform endoscopy without sedation more often than Americans [4]. There are several levels of sedation including minimal sedation (Anxiolysis), Moderate (Conscious) sedation, deep sedation, and general anaesthesia. A routine endoscopy can be successfully performed under moderate or deep sedation; however, moderate sedation provides adequate anxiolysis, pain control and amnesia to most patients and is currently safer than deep sedation [5]. Conscious sedation should be achieved with sedatives and analgesics, where the patient exhibits purposeful response to verbal and light tactile stimulation [6]. Sedation helps patients tolerate endoscopy. Despite this, Excessive sedation has been shown to increase the risk of cardiovascular death following endoscopy in high-risk patients. It's particularly relevant to older patients (Greater or equal to 70 years of age) whose median level of sedation should be approximately half of that of younger patients. In Ireland the most sedative agent used is midazolam. Pain is controlled through the administration of analgesics; most commonly, fentanyl or pethidine. [7] Non-sedated endoscopy offers several potential advantages, such as lower cost, higher efficiency, and decreased post-endoscopic impairment, which allows patients to drive sooner. [8] The recovery room is necessary for endoscopic sedation. When there is limited space in the recovery room, the relatively long residual effects of opiates and benzodiazepines may prove problematic. When patients are delayed in recovering or being discharged, endoscopic procedures might have to be temporarily paused until the recovery room is available. Increased demand for endoscopy procedures, pressure on endoscopy units to improve efficiency, and a high patient turnover have all led to a greater interest in non-sedation options. Endoscopy suits need an efficient flow of patients, and the recovery room has limited space and time [9].

Problem statement: In this study, we compared the length of time spent in the recovery room following endoscopic operations with and without sedation and looked for any differences in pain scores that were statistically significant.

Rationale and Justification: Sedation and using colonoscopy and OGD with its different types is one of the main points that help in reaching the diagnosis and having a good finding, also it affects the patient's satisfaction towards the procedure, each one of them has its own advantages and disadvantages to the other one, which is related to each other as it may have concerns in the postoperative and the complications. Thus, this study compares the findings regarding both using sedation and non-sedation OGD and Colonoscopy.

Research objectives

General Objectives

To Compare the use of sedation or not using it while doing OGD and Colonoscopy

Specific Objectives

Specific objectives regarding the colonoscopy

- To assess the findings regarding the Colonoscopy procedure with and without using sedation.
- To assess the pain score regarding the colonoscopy procedure with and without using sedation. (Age, Sex, Time, dose, and pain).
- To correlate the findings regarding the colonoscopy (Pain, time, and use of sedation) with the sex and age.

Specific Objectives regarding the OGD

- To assess the findings regarding the OGD procedure with and without using sedation (Age, Sex, Time, Dose)
- To correlate the findings regarding the OGD (age, sex and dose) to Time.

Literature Review

OGD

Esophagogastroduodenoscopy (OGD) is a diagnostic procedure commonly employed in the medical field. It involves the insertion of a small, flexible endoscope either through the oral or nasal cavity. The endoscope is skillfully manoeuvred through the pharynx, oesophagus, stomach, and duodenum, allowing for a comprehensive examination of these anatomical structures. In certain instances, a lengthier endoscope known as an enter scope may be utilized to access the jejunum by traversing the ligament of Treitz. [10] OGD is used for both diagnostic and therapeutic applications. In contemporary endoscopes, video chips have become the preferred method for improving image quality, replacing the outdated fibre optic-based endoscopes that were previously used for image transmission. [11] OGD is commonly performed in the United States under conscious or moderate sedation. However, it is also possible to conduct the procedure using only topical anaesthesia, a practice more prevalent in Europe and Asia. In cases where patients have a history of chronic narcotics use and are challenging to sedate, general anaesthesia may be employed. [11] In general, the process is conducted in a dedicated endoscopy facility located within a hospital or outpatient clinic. Nevertheless, it is also feasible to perform the procedure in alternative medical environments such as the emergency department, intensive care unit, or operating room by utilizing portable endoscopy carts. Various types of equipment and endoscopes are employed to carry out supplementary procedures such as Endoscopic Ultrasonography (EUS), Endoscopic Retrograde Cholangiopancreatography (ERCP), and small-bowel endoscopy [12].

Indications

Indications for OGD include the following

- Diagnostic evaluation for signs or symptoms suggestive of upper gastrointestinal (GI) disease (e.g., dyspepsia, dysphagia, noncardiac chest pain, or recurrent emesis), such as Gastroesophageal Reflux Disease (GERD)
- Surveillance for upper GI cancer in high-risk settings (e.g., Barrett oesophagus or polyposis syndromes)
- Biopsy for known or suggested upper GI disease (e.g., malabsorption syndromes, neoplasms, or infections)
- Therapeutic intervention (e.g., retrieval of foreign bodies, control of haemorrhage, dilatation or stenting of stricture, ablation of neoplasms, or gastrostomy placement) [13].

Contraindications

Contraindications for OGD include the following:

- Possible perforation
- Medically unstable patients
- Unwilling patients
- Anticoagulation, pharyngeal diverticulum, or head and neck surgery (relative contraindications) [14]
- Diagnostic OGD is considered a low-risk procedure for bleeding in patients on anticoagulants and therefore can be performed without adjustment of anticoagulants before the procedure. However, if polypectomy is contemplated or conceivable, then the patient's coagulation profile should be normalized. A risk of retropharyngeal hematoma also may be present in patients with severe coagulation abnormalities.
- Certain therapeutic procedures (i.e., dilations, percutaneous endoscopic gastrostomy [PEG], polypectomy, endoscopic sphincterotomy, EUS-guided fine-needle aspiration [FNA], laser ablation, and coagulation) are considered high-risk procedures for bleeding, and adjustment of anticoagulation may be necessary [15].

Procedural Planning

The constraints associated with bending in Trans nasal Esophagogastroduodenoscopy (TN-OGD) pose challenges in accessing specific regions of the stomach. To investigate the impact of these limitations on the quality and quantity of gastric specimens obtained through two-directional TN-OGD, Rhee et al conducted a study. The quantity of specimens was assessed based on their diameter, depth, and the identification of various tissue layers. The quality of specimens was evaluated by considering their anatomical orientation, the presence of crushed artefacts, and the overall diagnostic adequacy [16].

Patient Preparation

Anesthesia

In the United States, conscious sedation and topical anaesthesia are commonly utilized during esophagogastroduodenoscopy (OGD) procedures. However, there is a growing trend towards the use of monitored anaesthesia care and propofol due to its rapid recovery time. Wu et al conducted a retrospective study that demonstrated a higher rate of small-bowel neoplasm detection when OGD was performed with propofol sedation compared to procedures performed without sedation. Nonetheless, in many other countries, OGD is typically conducted using only topical anaesthesia. [17] The utilization of topical anaesthesia, such as Cetacaine or lidocaine, offers numerous advantages. These include a reduction in the duration of the procedure, obviating the requirement for sedation, and cost reduction through the mitigation or elimination of recovery time and nursing personnel. Nevertheless, there are certain limitations associated with this approach, such as patient discomfort and challenges encountered when performing the procedure on an uncooperative patient. [17] The growing trend towards cost-effective strategies in the healthcare sector may result in an upsurge in the utilization of esophagogastroduodenoscopy (OGD) procedures without sedation in the United States. The emergence of smaller endoscopes that can be inserted nasally may enhance the attractiveness of OGD without sedation for patients [17].

When administering conscious sedation, it is important to continuously monitor the patient. This includes monitoring pulse oximetry, heart rate, and blood pressure. It is also recommended to use ECG monitoring for patients with cardiopulmonary disease, elderly patients, and during longer procedures. [18] Children are at a higher risk of encountering adverse consequences when undergoing procedural sedation for esophagogastroduodenoscopy (OGD). Therefore, it is imperative to prioritize the safety of pediatric patients during the performance of OGD. Endoscopists should be adequately equipped to administer advanced life support, while anesthesiologists should be prepared to promptly intervene in the event of severe adverse events occurring during the procedure [19].

Agents that may be used in OGD include the following

- Benzodiazepines - midazolam, diazepam
- Opioids - meperidine, fentanyl
- Reversal agents - flumazenil, naloxone

Midazolam is frequently employed as a sedative/hypnotic

agent for the purpose of sedation during endoscopic procedures. Its peak effect is typically observed within a span of 3 to 5 minutes, and its duration of action ranges from 1 to 3 hours. Adverse effects associated with midazolam administration encompass respiratory depression, hypotension, and paradoxical agitation. The recommended initial dosage is 0.5 to 2 mg administered intravenously (IV), with subsequent adjustments in 1 mg increments to attain the desired level of sedation. It is advisable to administer lower doses of midazolam to elderly patients with cardiac and pulmonary conditions to mitigate the risk of severe complications. [20] In the context of sedation during endoscopic procedures, midazolam is often preferred over diazepam by medical facilities due to its amnesic properties and reduced likelihood of causing phlebitis. Nevertheless, diazepam remains a viable alternative in this regard [20].

Meperidine is a painkiller with sedative properties that exhibits a delayed onset of action. Its duration of effect is prolonged, and its clearance from the body is gradual. Concurrent administration of meperidine with benzodiazepines carries the risk of respiratory depression and excessive sedation. The peak analgesic effects of meperidine are typically experienced approximately 10 minutes after ingestion, and its therapeutic activity persists for a duration of 2-3 hours. Potential adverse reactions encompass respiratory depression, hypotension, as well as gastrointestinal symptoms such as nausea and vomiting. The recommended initial intravenous dose of meperidine ranges from 15-50 mg, with subsequent doses not exceeding 25 mg. [20] Fentanyl is a potent narcotic analgesic that possesses mild sedative characteristics. It exhibits a rapid onset of action and has a brief duration of effect. It is frequently employed in ambulatory endoscopic procedures conducted at endoscopy centres. The maximum therapeutic impact is typically observed within 5-8 minutes, and its effects persist for a duration of 1-3 hours. Respiratory depression represents a significant hazard associated with fentanyl administration. The customary initial dosage is 0.03-0.1 mg administered intravenously, with subsequent doses ranging from 0.02-0.05 mg [20].

Flumazenil is frequently employed to counteract the sedative and respiratory-depressant consequences induced by benzodiazepines. The maximum impact of flumazenil is typically achieved within a span of 3 to 5 minutes, and its effects endure for approximately 1 to 2 hours. Adverse effects that may arise include reedition and seizures. The customary dosage for reversing sedation is 0.2 to 0.5 mg administered intravenously, with a maximum total dosage of 1 mg. Conversely, in the case of benzodiazepine overdose, the typical dosage is 1 to 3 mg administered intravenously. [21] Naloxone possesses the ability to counteract analgesic properties, impact the central nervous system, and respiratory depression induced by opioids. The onset of naloxone's maximum efficacy typically occurs within a span of 1-2 minutes, with its effects persisting for approximately 1-3 hours. Adverse reactions associated with naloxone administration encompass pain, restlessness, nausea, emesis, arrhythmias, sudden fatality, pulmonary oedema, and withdrawal symptoms in individuals who misuse opioids. The recommended dosage for reversing analgesia or sedation is 0.04 mg administered intravenously, while the dose for managing narcotic overdose and respiratory arrest is 0.4 mg [21].

Other agents that have been investigated include propofol and dexmedetomidine. In a study conducted by Wu et al, the efficacy of propofol and dexmedetomidine was compared in patients undergoing esophagogastroduodenoscopy (OGD) under conscious sedation. The findings of the study demonstrated that both agents achieved a satisfactory level of sedation without notable adverse effects. Patients expressed a preference for propofol due to its more potent sedative properties and faster recovery time, whereas dexmedetomidine exhibited minimal impact on respiratory function [21].

Monitoring & Follow-up

After the procedure is finished and the patient has been given conscious sedation, they should be moved to a recovery room where an endoscopy nurse will continue to monitor them. Once the patient is awake and able to move around (usually after about an hour), they can be accompanied out of the recovery room. The patient should be given instructions for after the procedure, such as dietary and activity guidelines, and should be advised to be aware of any signs of gastrointestinal bleeding, fever, or abdominal pain. [22] Typically, a follow-up appointment with the primary care doctor or the endoscopist is scheduled before the patient is released from the endoscopy unit [22].

Colonoscopy

Colonoscopy is a well-established medical procedure used to comprehensively evaluate the large bowel, specifically the colon or large intestine, from the rectum to the cecum. It is widely recognized as the most reliable method for detecting polyps and colorectal cancer. The safety and effectiveness of colonoscopy in assessing the condition of the large bowel have been extensively documented. Recent technological advancements in colonoscopy have allowed for the capture of high-resolution images of the inner lining of the colon, facilitated by a video camera attached to the end of the scope. These images can be conveniently stored, printed, and analyzed on a computer. [23] Colorectal cancer screening and surveillance are essential components of colonoscopy, as it is a highly effective method for detecting and preventing this disease. Despite being largely preventable, colorectal cancer continues to be the second leading cause of cancer-related deaths in the United States. Both men and women have a nearly 6% lifetime risk of

developing invasive colorectal cancer. Implementing appropriate screening measures, such as colonoscopy, is crucial in reducing mortality rates across all age groups and is therefore a significant aspect of this endeavour [24].

Indications

Screening, Evaluation, and Follow-Up Of Colorectal Cancer

Screening in Average-Risk Adults

The American Cancer Society (ACS), the World Health Organization (WHO), the US Preventive Services Task Force (USPSTF), the American College of Physicians (ACP), and the American Gastroenterological Association (AGA) all have different recommendations for colorectal cancer screening. However, it is now usually advised that average-risk persons start colorectal cancer screening at age 45. There are a few approved screening options, the most popular of which is a colonoscopy every ten years in the United States. [25] Annual faecal occult blood testing (FOBT), faecal immunohistochemistry testing (FIT), stool DNA testing (multitarget DNA testing), and colonoscopy are other procedures that screen for colon cancer. Nowadays, barium enema is rarely used since newer techniques like computed tomography (CT) colonography are more widely accepted [26].

Contraindications

The risk of a colonoscopy is thought to increase during pregnancy. There are no recommendations for colonoscopy during pregnancy due to a lack of data. The most extensive documented series includes eight prenatal colonoscopies. Six patients in this study gave birth to healthy infants following a colonoscopy. One patient had an intentional abortion, while another experienced a miscarriage unrelated to a colonoscopy. [27] In general, when colonic surgery is the only other option or when colon cancer is suspected, a colonoscopy may be recommended for serious life-threatening disorders during pregnancy. Instead of a doctor's office, a hospital atmosphere is preferable for the procedure. Delay monitoring colonoscopy until the postpartum period if you have a history of polyps, malignancy, or abdominal pain. [28] Toxic megacolon, fulminant colitis, severe IBD with ulceration, and known or suspected colonic perforation are additional relative contraindications for colonoscopy; these disorders raise the risk of perforation [29].

Preprocedural Planning

Bowel Preparation

To maximise the thoroughness and safety of colonoscopy, the colon must be completely empty before the procedure. Several options are available for PR colonoscopy and bowel cleansing. The most commonly used preparations are as follows:

1.5 oz of Fleet Phospho-Soda liquid mixed into half a glass of water, followed by a full glass of water at 3:00 PM and again at 7:00 PM on the day prior to the examination.

4 L of polyethylene glycol (PEG) solution (e.g., GoLYTELY, NuLYTELY, CoLyte) administered orally over a 1- to 3-hour period on the evening prior to colonoscopy [30].

Patient Preparation

Anaesthesia

Sedative drugs are frequently used during colonoscopies. Cons of giving sedatives during colonoscopy include greater risk of complications, higher cost, and longer patient recovery times. [31] Because some individuals considered the examination to be very mild or not at all uncomfortable, some studies have shown that routine use of conscious sedation does not seem to be necessary. However, some researchers have hypothesized that without conscious sedation, the rate of cecal intubation may decline and the risk of malignancy and missed adenomas may rise. [32] The standard premedication for colonoscopy has been IV benzodiazepines, either alone or in combination with a narcotic. The most widely utilized drugs are midazolam (2-5 mg) and diazepam (5-10 mg). As required, meperidine (25-100 mg) may be added. While benzodiazepines and opioids together may cause sleepiness more easily, they also increase the risk of respiratory depression. [33] During colonoscopies, the short-acting IV sedative propofol has grown in popularity. In contrast to traditional narcotic-benzodiazepine combinations, it does not induce analgesia but instead causes a deeper level of sedation with a rapid onset and shorter recovery period. An anesthesiologist present during the colonoscopy typically administers propofol. Throughout the procedure, patients must be watched for any negative side effects of these medications as well as have their vital signs (such as blood pressure, pulse, and oxygen saturation) monitored. [33] On the days leading up to the test, warfarin, aspirin, NSAIDs, and iron supplements ought to be stopped. Taking insulin while fasting before a colonoscopy is not advised. Foods that can be misconstrued during testing, such as red or purple foods, Jell-O, or drinks, should be avoided the day before the test. On the day of and the night before the colonoscopy, patients should avoid solid foods and only consume clear liquids [34].

Methods

Study design

A Retrospective Cohort Study, a hospital-based study design was used in this study.

Study duration

The period from January 2022 to March 2022

Study area/study setting

Wexford General Hospital, Wexford, Ireland.

Study Population

All consecutive patients who underwent Colonoscopy or OGD with the use of sedation or not using it, and the time they spent in the recovery room during the period of the study.

Sample size and Sampling technique

The sample technique was total coverage because it was with a low number of patients, the sample size was 50 for each group using sedation with colonoscopy, colonoscopy without sedation, OGD with sedation and OGD without sedation which is 200 patients.

Data collection tool and method

Chart review and medical records in the recovery unit containing the sociodemographic data which included the age and sex, the dose and the time of the dose lasted, and the time the patient stayed in the recovery unit.

The data analysis plan

The data processing and analysis were performed using the Statistical Package for Social Sciences (SPSS) (Armonk, NY, USA, version 26). The data was analyzed using descriptive statistical and analytical metrics that are appropriate for the variable's measurement level, and which achieve the objectives of the study. Cross-tabulations, Chi-square test, The P-value is considered significant if <0.05.

Ethical considerations

This study was done after obtaining approval from the audit committee and the quality and risk department of Wexford General Hospital. Confidentiality and privacy were considered and maintained, and the study information and data were only used for research purposes. Data was used anonymously using identity numbers instead of names to protect patients' identities and kept securely.

Results

General Results

In this study, the researcher had a sample size of 200 patients who underwent either colonoscopy or OGD, being divided into four groups males/females, had sedation, or didn't have. This section related to the main results for all the groups:

Analysis of the General data

Regarding the sociodemographic data the mean age was 60.5 years old generally, with 108 males (54%), and 92 females (46%), with the type of sedation with 50 patients had OGD with no sedation (25%), 50 had it with sedation (25%), 50 had Colonoscopy with only fentanyl (25%), 50 had it with both fentanyl and midazolam (25%). Regarding the dose range of fentanyl, 97 patients had between 25-50 mcg, and 3 patients more than 50 mcg, For the dose of midazolam, 95 patients had between 1.5-3.0 mg, and 5 patients had between 4-5 mg. For the LOS (min) as staying in the recovery room, 99 patients spent more than 120 minutes (49.5%), 58 patients between 61-120 (29%), and 43 patients between 9-60 minutes (21.5%).

Analysis of OGD

For the age of the patients, the mean was 59.07 years old, with 50 males (50%), and 50 females (50%). Regarding the type of sedation 50 patients had OGD with no sedation (50%), and 50 patients had midazolam sedation (50%). Regarding the Doses of the midazolam 50 had no sedation (50%), 45 had between 1.5-3.0 (45%), 5 had between 4-5 (5%), with a mean of 1.25, regarding the LOS (Min) as in the recovery room 43 patients spent more than 120 minutes (43%), 37 patients between 9-60 (37%), 20 patients between 61-120 (20%) with a mean of 93.93. For the correlation of sedation and the time, it took 135.5 minutes as a mean with sedation while without sedation it was 52.3 minutes as a mean, with a P Value of 0.01. Regarding the correlation with the dose, the mean was 2.4 mg for more than 120 minutes, 0.85 mg between 61-120 minutes and 0.14 mg for between 9-60 minutes with a P-value of 0.00.

For using Colonoscopy

The age mean was 62.08 with 42 females (42%), and 58 males (58%), for the type of sedation 50 patients had it with only fentanyl (50%), and 50 patients had both fentanyl and midazolam (50%). For the dose of Fentanyl, the mean was 50.25 mcg, the minimum 25 mcg, and the maximum 100 mcg. For the midazolam the mean was 1.23 mg, the minimum was 0 and the maximum was 3mg, Regarding the pain score the mean was 1.41. Regarding the time the mean was 129.08 minutes, the minimum 41min, and the maximum was 288 min. For the crosstabulation between the time and sedation regarding using both fentanyl and midazolam, the mean was 161.22 min, while for only fentanyl the mean was 96.94 min, with a P-value of 0.173.

Table 1 Distribution of participants according to sociodemographic data (General)

		Count	Table N %
Age		**Mean**	60.58
Gender	**Male**	108	54.0%
	Female	92	46.0%

Table 1: General Sociodemographic data.

Table 2 Distribution of participants according to the type of sedation methods (General)

		Count	Table N %
Type of Sedation and Method	**OGD ''No Sedation"**	50	25.0%
	OGD ''Midaz Sedation"	50	25.0%
	Colonoscopy ''Only Fentanyl"	50	25.0%
	Colonoscopy ''Fentanyl + Midaz"	50	25.0%

Table 2: General Type of sedation methods.

Table 3 Distribution of participants according to Doses of drugs, pain score and time (general)

Dose Range of Fentanyl			
	Between 25-50	97	97 %
	More than 50	3	3 %
Dose Range of Midazolam			
	Between 1.5-3.0	95	95 %
	Between 4-5	5	5 %
Score Range(colonoscopy)	**Mild (0-2)**	92	92 %
	Moderate (3-4)	8	8 %
LOS (Min) Range	**>120**	99	49.5%
	Between 61-120	58	29.0%
	Between 9-60 min	43	21.5%

Table 3: General doses of drugs, pain score and time.

Analysis related to the OGD as the second part

For the patients who underwent OGD using sedation or without use of it. Table 4 Distribution of participants according to sociodemographic data (OGD)

		Count	Table N %
Age		**Mean**	59.07
Gender	**Male**	50	50.0%
	Female	50	50.0%

Table 4: OGD Sociodemographic data.

Table 5 Distribution of participants according to type of sedation (OGD)

		Count	Table N %
Type of Sedation and Method	**OGD ''No Sedation"**	50	50.0%
	OGD ''Midaz Sedation"	50	50.0%

Table 5: OGD Type of sedation.

Table 6 Distribution of participants according to Doses of drugs and time (OGD)

		Count	Table N %
Dose Range of Midazolam	**Nil**	50	50.0%
	Between 1.5-3.0	45	45.0%
	Between 4-5	5	5.0%
Dose(mg) of Midazolam		**Mean**	1.25
LOS (Min) Range	**>120**	43	43.0%
	Between 9-60 min	37	37.0%
	Between 61-120	20	20.0%
LOS (Min)		**Mean**	93.93

Table 6: OGD Doses of drugs and time.

Table 7 Crosstabulation between sedation and time (OGD)

		LOS (Min) Mean
Type of Sedation and Method	**OGD ''Midazolam Sedation"**	135.50
	OGD ''No Sedation"	52.36

P Value of 0.016

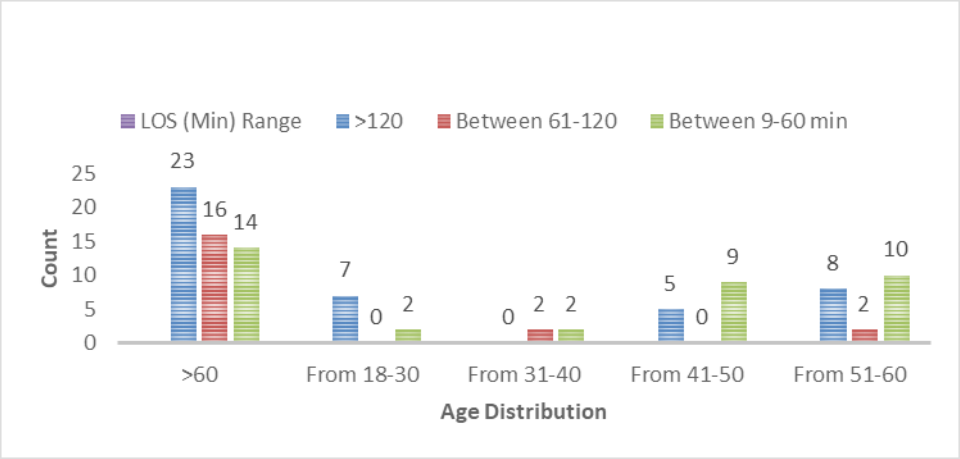
Table 7: Crosstabulation between type of sedation and time (OGD).

Table 8 Crosstabulation between the Dose of Midazolam and time (OGD)

		Dose(mcg) of Midaz Mean
LOS (Min) Range	**>120**	2.40
	Between 61-120	0.85
	Between 9-60 min	0.14

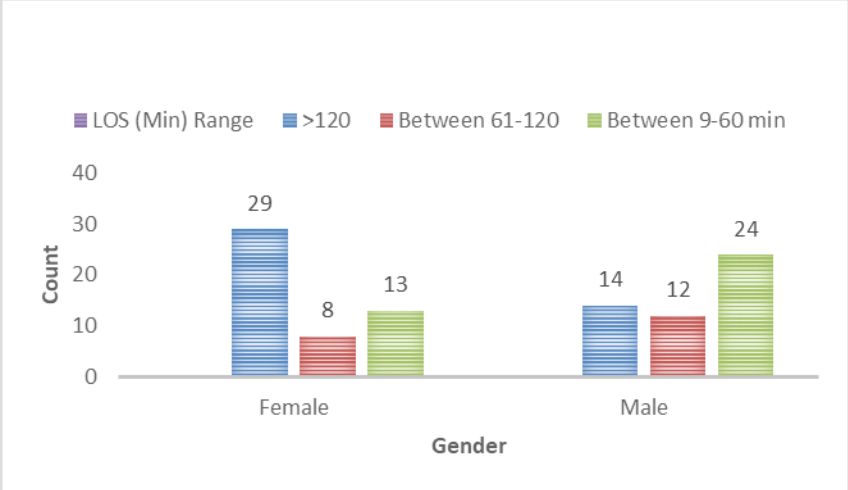
P Value of 0.00

Table 8: Crosstabulation between Doses of Midaz and Time (OGD).



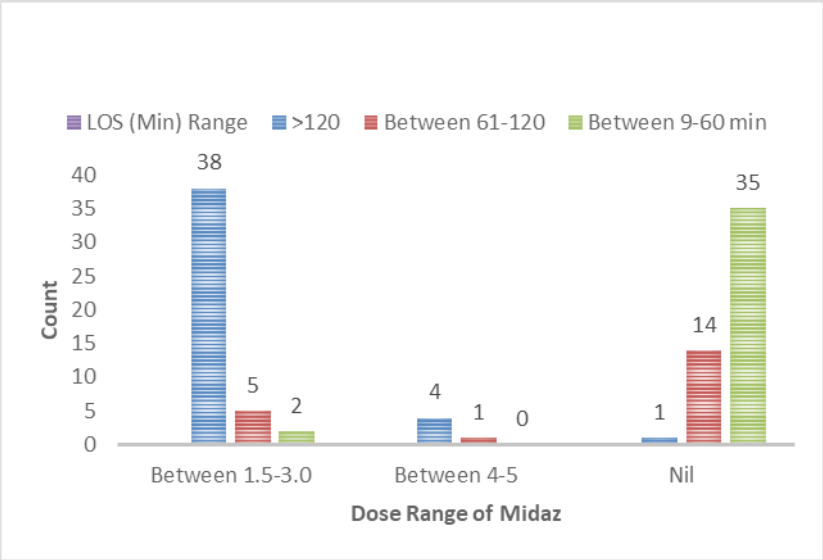
P Value of 0.00

Figure 1: Crosstabulation between age and time (OGD).



P Value of 0.01.

Figure 2: Crosstabulation between gender and time (OGD).



P Value of 0.00

Figure 3: Crosstabulation between dose of Midazolam and time (OGD).

Data regarding the use of Colonoscopy and sedation

Table 9 Distribution of participants according to Sociodemographic data (Colonoscopy)

		Count	Table N %
Age		**Mean**	62.08
Gender	**Female**	42	42.0%
	Male	58	58.0%

Table 9: Colonoscopy Sociodemographic data.

Table 10 Distribution of participants according to the type of sedation (Colonoscopy)

		Count	Table N %
Type of Sedation and Method	**Colonoscopy ‘’Only Fentanyl”**	50	50.0%
	Colonoscopy ‘’Fentanyl Midazolam”	50	50.0%

Table 10: Colonoscopy Type of sedation.

Table 11 Distribution of participants according to doses of drugs, pain score and Time mean (Colonoscopy)

	Mean	Minimum	Maximum	Standard Deviation
Dose of Fentanyl in mcg	50.25	25.00	100.00	10.36
Dose of Midazolam in mg	1.23	.00	3.00	1.29
Pain score	1.41	1.00	4.00	0.71
LOS (Min)	129.08	41.00	288.00	46.22

Table 11: Colonoscopy Doses of drugs, pain score and time mean.

Table 12 Distribution of participants according to doses of drugs, pain score and Time (Colonoscopy)

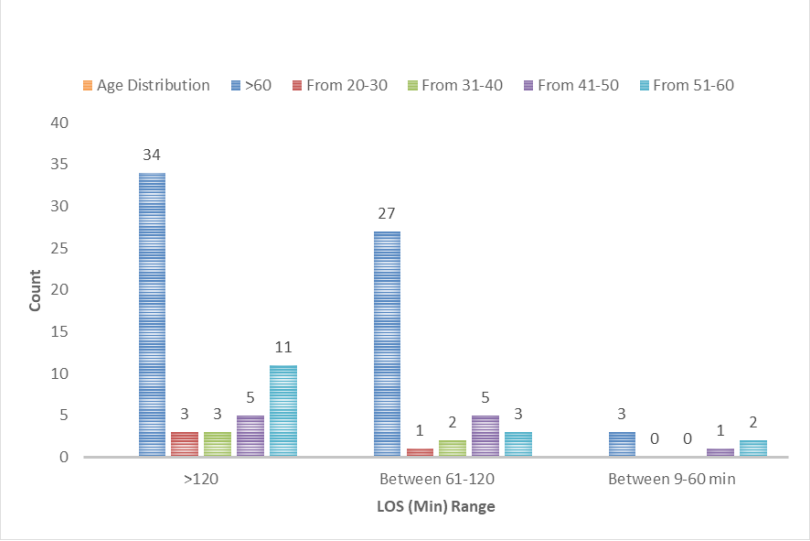
		Count	Table N %
Dose ranges of Fentanyl	**Between 25-50**	97	97.0%
	More than 50	3	3.0%
Dose ranges of Midaz	**Nil**	50	50.0%
	Between 1.5-3.0	50	50.0%
Pain range	**Mild (0-2)**	92	92.0%
	Moderate (3-4)	8	8.0%
LOS (Min) Range	**>120**	56	56.0%
	Between 61-120	38	38.0%
	Between 9-60 min	6	6.0%

Table 12: Colonoscopy Doses of drugs, pain score and time ranges.

Table 13 Crosstabulation between time and type of sedation, doses of both drugs used

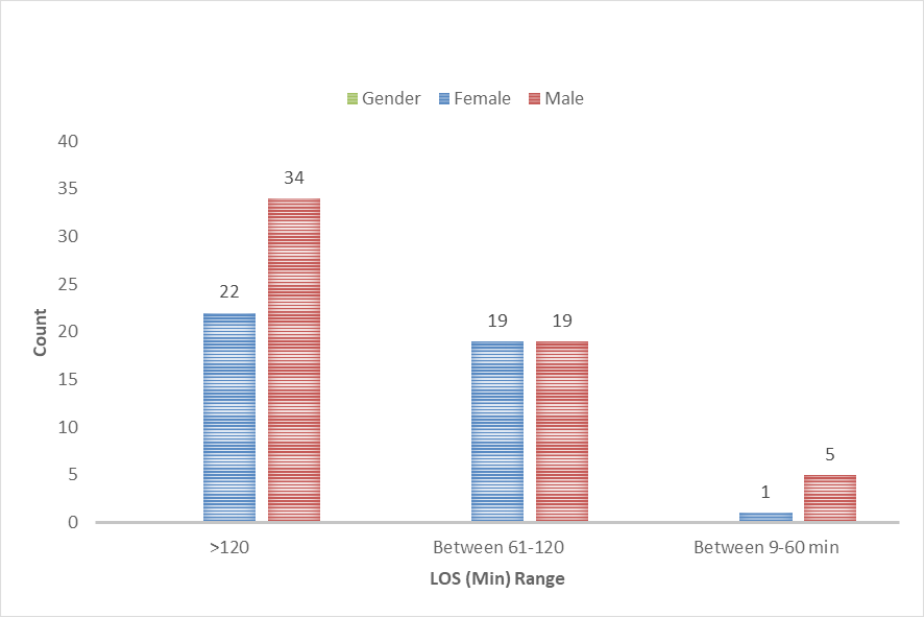
		LOS (Min) Mean	P Value
Type of Sedation and Method	**Colonoscopy ''Fentanyl + Midaz"**	161.22	0.173
	Colonoscopy ''Only Fentanyl"	96.94	
Dose ranges of Fentanyl	**Between 25-50**	129.32	0.22
	More than 50	121.33	
Dose ranges of Midazolam	**Between 1.5-3.0**	161.22	0.17
	Nil	96.94	

Table 13: Crosstabulation between time and type of sedation, doses of drugs (Colonoscopy).



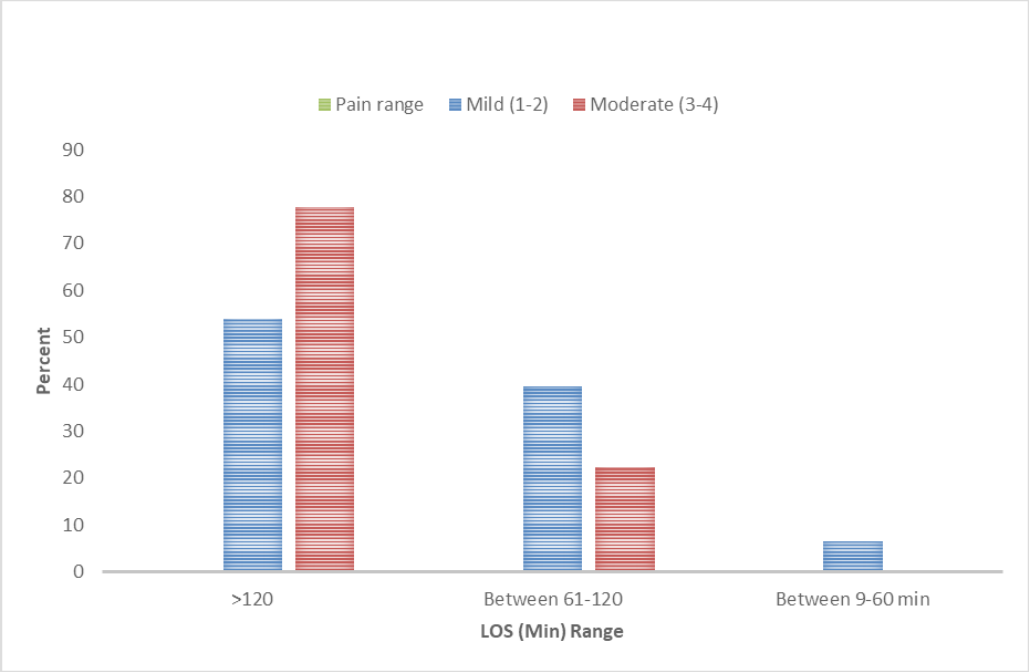
P Value of 0.728

Figure 4: Crosstabulation between age and time (Colonoscopy).



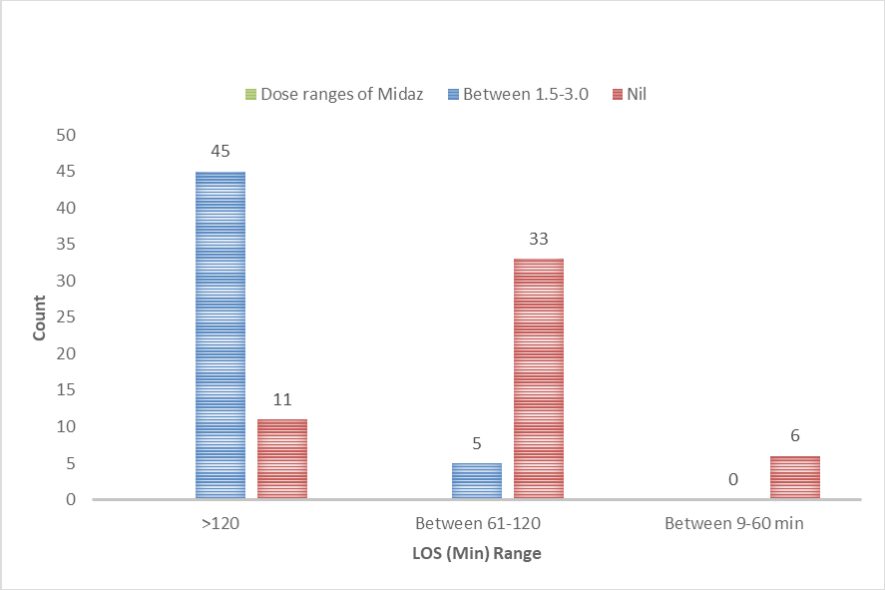
P Value 0.25

Figure 5: Crosstabulation between gender and time (Colonoscopy).



P Value of 0.00

Figure 6: Crosstabulation between pain range and time (Colonoscopy).



P value 0.354

Figure 7: Crosstabulation between the dose of Midazolam and time (Colonoscopy).

Figure 8: Crosstabulation between LOS and fentanyl only.

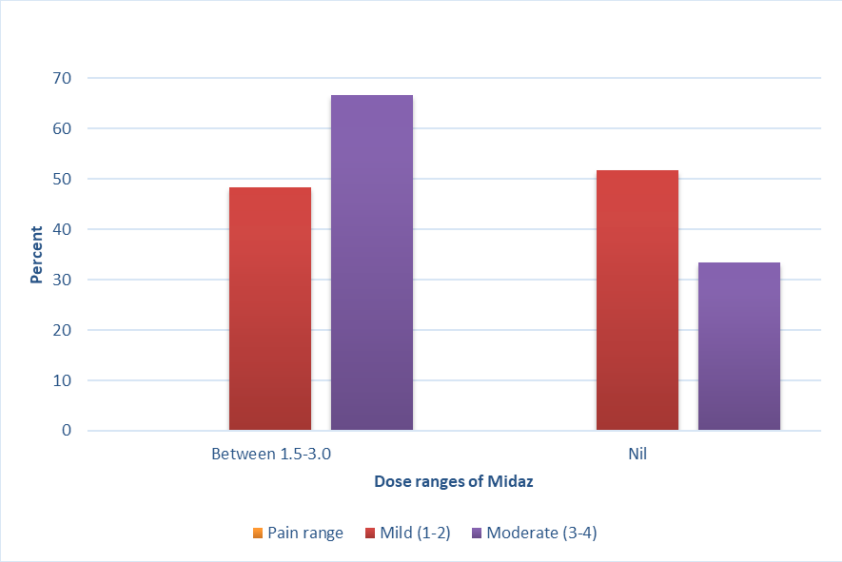


Figure 9: Crosstabulation between LOS and fentanyl and midazolam.

Discussion

This study was done on patients who underwent either colonoscopy or OGD, with or without using sedation, with the following significant findings:

Regarding the patients who underwent OGD The mean age was 59.07 years old, with half of the patients being males and half of them females. Regarding the type of sedation half of the patients had no sedation and half of them had midazolam. Regarding the dose of midazolam, the majority had between 1.5-3 mg with a mean of 1.25 mg. Regarding the time range, the majority stayed in the recovery for more than 120 minutes with a mean of 93.93 minutes. Regarding the crosstabulations for the time with the type of sedation for the Midazolam sedation group the time mean was 135.5 minutes, while for the ones who didn't have sedation, the mean was 52.36 minutes which indicates that using the sedation prolonged time in the recovery unit, with a P-Value of 0.01 which is significant, regarding the Comparison with the dose majority who have had a higher dose had a more prolonged recovery time with majority had a high dose continued for over two hours. With a P-value of 0.00 which is significant. Regarding the crosstabulation between age and time majority who were older had a prolonged recovery time in comparison with the patients who were younger with a P Value of 0.00 which is significant. Regarding the comparison with the gender, the females have had a higher percentage in the time with a P Value of 0.01 which is significant. Regarding the comparison with the dose most of the patients who have had a higher dose have had a higher time in the recovery and more prolonged it was with a P Value of 0.00 which is significant.

Regarding the patients who underwent Colonoscopy for the age the mean was 62.08 years old with the males being slightly higher than the females in the procedure, Regarding the type of sedation and methods half of the patients had only Fentanyl and half of them had fentanyl and midazolam. Regarding the dose ranges of the fentanyl, the mean was 50.25±10.36 Std. deviation, while for the dose of the midazolam, the mean was 1.23±1.29 Std. deviation for the pain score, the mean was 1.41±0.71 Std. deviation, regarding the LOS (Min) or time the mean was 129.08±46.22 Std. deviation, For the dose, fentanyl majority were having it between 25-50 mcg, and all the patients had a range of midazolam between 1.5-3.0 mg. Regarding the pain range majority of the participants had a low dose, regarding the time majority of the participants more than half had it stayed more than two hours.

For the crosstabulation between the time and the type of sedation majority of the patients who had both midazolam and fentanyl spent more time in the recovery in comparison with only fentanyl with a P value of 0.173 which is not significant. Regarding the dose of fentanyl, it was near to each other with a difference of ±9 mcg, with a P-Value of 0.22, regarding the comparison with the use of midazolam there was a huge difference in using it with increasing the time in the recovery with a P-Value of 0.17 which is not significant. Regarding the crosstabulation with age and time majority of the patients were older and had a higher time with a P-Value of 0.7 which is not significant. Regarding the crosstabulation between the gender and the time the males have had a higher time in comparison with the females with a P Value of 0.25 which is not significant. Regarding the crosstabulation

between the dose of midazolam and the time, most patients who had a mild pain score had a longer procedure time, with a P value of 0.00 which is significant. However, regarding the comparison with the pain score and time, most of the patients had a moderate pain score, and had a longer recovery time, with a P value of 0.354 which is not significant. Most of the patients who underwent colonoscopy had mild to moderate pain 92%, and 8% had severe pain. The mean pain score with fentanyl only was 1.3 and for both midazolam and fentanyl was 1.5. Of note, the more severe pain the longer time in the recovery.

Summary

Conclusion of the study

This study concluded that the majority of the patients who have had OGD with sedation had a prolonged time in doing the procedure which exceeding two hours it was also noticed that the ones who didn't have any type of sedation had a lower time and short time to do the procedure, while for using the Colonoscopy majority of the patients have had a higher time in using both Midaz and Fentanyl in comparing with the one who had only Fentanyl, which indicates that also using Midaz increase the time of the stay in recovery, This study had also indicated that using two types of sedation in the procedures as colonoscopy decrease the number of the pain score and decrease the feeling of the pain sensation in the patients.

Limitations of the study

The number of the patients in this study was limited because of: the unicentral, non-randomized, non-blinded study, so it was limited to only 50 patients of each group of the study.

Conflict of interest: the author has nothing to disclose.

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