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ORIGINAL ARTICLE

Dexmedetomidine versus Ketamine Infusion for Reducing Intra and Post-Operative Opioid Consumption in Obese Patients Undergoing Abdominal Surgeries

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ABSTRACT

Background: Dexmedetomidine possesses sedative and analgesic effects and is a selective α-2 adrenoceptor agonist.Researchers have been particularly curious about the role of ketamine in the contemporary opioid crisis.This study aimed toevaluate and compare between dexmedetomidine infusion versus ketamine infusion for reducing opioid consumption among obese patients undergoing abdominal surgeries. **Methods:**We conducted thisprospective double blinded randomized controlled trial onseventy-eight obese patients of class I&II undergoing abdominal surgeries. They were categorized in three groups (26 cases in each group):Group C (Control): received 0.9% normal saline, Group D (Dexmedetomidine): after bolus of 0.5 µcg/kg,they received dexmedetomidine infusion (4µcg/mL), Group K (Ketamine): after bolus of0.3 mg/kg theyreceived ketamine infusion (2 mg/mL).The intraoperative (total dose of fentanyl and hemodynamics) and postoperative (numeric rating scale (NRS), Modified Observer's assessment of alertness/sedation scale (MOAS/S)and rescue analgesic dose) were evaluated. **Results:**The Dexmedetomidine group showed highly significant ($p<0.001$) better MOAS\S score than the other two groups immediately postoperative. The Ketamine group had significant ($p\leq0.05$) better NRS score than the Dexmedetomidine group at 6 and 12 hours.The Ketamine group needed highly significant ($P \leq0.001$) longer time to first require analgesic compared to the control group and significantly ($P <0.05$) longer than the Dexmedetomidine group.The Ketamine group needed highly significant ($P \leq0.001$) lower total rescue Nalbuphine dose than the other two groups and Dexmedetomidine group had highly significant ($P \leq0.001$) lower dose than the control group.Dexmedetomidine group showed less incidence of nausea and vomiting postoperatively, and Ketamine group showed no hypotension at 12 hours which was significant when compared to other groups ($p<0.05$). **Conclusion:**Dexmedetomidine and ketaminecould effectively aid in pain managementamong obese patients undergoing abdominal surgery. While ketamine is more effective in reducing postoperative pain, dexmedetomidine is more effective at enhancing clinical outcomes in the intraoperative period.

Keywords: Dexmedetomidine, Ketamine, Midazolam, opioid consumption, obese patients, abdominal surgeries.

INTRODUCTION

Comorbidities of obesity are extensive and affect nearly all organ systems with a higher risk ofheart diseases, diabetes mellitus,high blood pressure, bone as well as jointsdiseases, lower self-esteem, decreased mobility, shortened life span, and higher incidence of nerve injury under sedation**.** These comorbidities inevitably add to a higher rate of peri-operative mortality[1].Therefore, these patients require careful pre-operative assessment and intra-operative management by anesthesiologists [2].

Complications such as chronic pain pain, longer hospital stays, higher mortality, and an increased risk of pulmonary and cardiovascular problems are all linked to postoperative pain [3].It is widely acknowledged that effective pain management has numerous advantages. Inadequate postoperative pain relief is still alarmingly common, and treating postoperative pain is still a big challenge[4].

Inadequate or incorrect use of existing analgesic medications may contribute to suboptimal pain management; this is likely due to the proliferation of contradictory and new information as well as the persistence of the conventional use of opioids rather than multimodal opioid-sparing analgesia [3].

Respiratory complications caused by opioids are more likely to occur among obese cases [5].Also, particular obesity-related complications, such as diabetes, heart failure, and lung disease, have been linked to long-term opiate usage after [6].

The opioid crisis has sparked a renewed focus on finding ways to reduce drug consumption[7].When it comes to obese patients, the Enhanced Recovery After Surgery Society suggests limiting the use of intraoperative opioids in order to lessen the risk of opioid-related complications following surgery. A new approach that aims to do this is opioid-free anesthesia, a multimodal method that combines various non-opioid medications with distinct effects [8].

Dexmedetomidine possessessedative, amnestic, analgesic effects,and sympatholytic actions, it is a powerful and extremely selective α-2 adrenoceptor agonist. In addition to sedation and analgesia, it has the unusual capability of not depressing the respiratory system. There is a large margin of safety for this new drug, and it has modest analgesic and sedative effects [9].The anesthetic ketamine acts as an antagonist to the N-methyl-D-aspartate receptor. Many studies have examined its possible use in pain management for both acute and chronic conditions and its involvement in the ongoing opioid crisis has gained researchers curiosity[10].

Ketamine produces hemodynamically stable anesthesia via central sympathetic stimulation without affecting respiratory function [11].Low-dose perioperative ketamine may reduce opioid consumption and chronic postsurgical pain after specific surgical procedures [12].It can maintain functional residual capacity, induce bronchodilation, and avoid cardiovascular depression [13].

We aimed at this study to assess and compare the effect of intravenous infusion of dexmedetomidine or ketamine on intraoperative (total dose of fentanyl and hemodynamics) and postoperative (numerical rating score and rescue analgesic dose) analgesia and decrease the need for opioids for 24h postoperative.

PATIENTS AND METHODS

We conducted thisprospective double blinded randomized controlled trial on seventy-eight obese patients of class I&II undergoing abdominal surgeries at Anesthesia, Intensive care, Pain management Department at Zagazig University Hospitals from August 2023 to February 2024.

After the Zagazig University Faculty of Medicine Research Ethics Committee (IRB#10640/2-4-2023), All participants were asked to sign an informed consent. Human subjects research adhered to the guidelines set in the Declaration of Helsinki, which is part of the World Medical Association's Code of Ethics.

Inclusion criteria: The study included 87 patients of both sexes aged 21–60 years, ofClass I obese patients (BMI 30-35 Kg/m^2), American Society of Anesthesiologists (ASA) classes I and II, who were undergoing elective abdominal operations with a duration range of 90 to 120 minutes.

Exclusion criteria: Patients who had Advanced abdominal malignancy (frozen abdomen), advanced hepatic, renal and cardiac patients, uncontrolled diabetic and hypertensive patients, patients who had

hypersensitivity of any drugs used in the procedures and emergent abdominal surgeries.

Preoperative assessment:Complete medical history wastaken, physical examinations, and laboratory investigations were performed on all study participants, including complete blood count (CBC),viral hepatitis markers random blood glucose,liver function test, kidney function test, and coagulation profile.

The patient kept fasting for 6 hours (hrs) for solid meals and 2 hrs for water or clear fluid. An independent anesthesia assistant not involved in intraoperative or postoperative management of patients prepared the study medication. Patients who were scheduled for abdominal surgery were randomly categorized using computer generated table in three groups.

Intraoperative:The patient was connected to the monitors, baseline vital parameters were recorded: blood pressure, oxygen saturation as well as heart rate.The patient received induction with intravenous lidocaine 0.5 mg/kg according to ideal body weight (IBW), propofol 1.5 mg/kg according to lean body weight (LBW) ,fentanyl 1 µg/kg according to total body weight (TBW), and rocuronium 1.1 mg/kg according to total body weight (IBW) for faster and easier endotracheal intubation.

A combination of oxygen and air was used to maintain general anesthesia with isoflurane 2 MAC. Every half an hour, rocuronium was administered.Normocapnia (end-tidal CO2 35-40 mmHg) was maintained while patients were mechanically ventilated. Intra-operative vital data was recorded every 5 minutes, then patients were categorized into three groups: (26 cases in each group):

Control group (C): After a bolus dose of 0.9% normal saline over 10-minutesduration via a 20 mL syringe. They received infusion of 50 mL in a 50-cc syringe of 0.9% normal saline. **Dexmedetomidine group (D):**according to the ideal body weight, after getting a bolus dose of 0.5 µcg/kg dexmedetomidine, diluted with 0.9% normal saline, administered in a 10-min duration. Then, they received dexmedetomidine infusion (200 µcg vials diluted in a 50-cc infusion syringe, concentration 4µcg/mL) with a rate of 0.5 µcg/kg/h until 10 min before the end of the surgery.**Ketamine group (K)**: according to the ideal body weight, after receiving a bolus dose of 0.3 mg/kg diluted with 0.9% normal saline and administered in a 10-min durationusing a 20-mL syringe injected before induction. They received ketamine infusion of 100 mg diluted in a 50-cc infusion syringe, with concentration of 2 mg/mL) with rate of 0.3 mg/kg/h until 10 min before the end of the surgery.

The patient was given a crystalloid fluid bolus of 10 mL/kg for 2 minutes when hypotension (defined as a mean arterial pressure [MAP] value less than 20% of the baseline) occurred. Subsequently, ephedrine was given in 6-mg increments. The anesthesiologist decided how much atropine to give patients with bradycardia, which is defined as a heart rate (HR) that is 20% or lower than baseline for at least 1 minute.

When tachycardia and hypertension (HTN) arise in the presence with adequate anesthetic and muscular relaxation, this was deemed as intra-operative discomfort. Hypertension was deemed to be present when the MAP value exceeded 20% of the baseline value on two separate occasions within 5 minutes of each other. Once the heart rate exceeded 100 beats per minute for at least 5 minutes, it was deemed tachycardia. An increase dose of 0.5 µcg of fentanyl per kilogram of body weight was given as a rescue measure. The Total dosage of fentanyl was determined.

Post operative:

The patient was given sugammadexat dose of 4 mg/kg later to ensure the muscle relaxant had fully recovered. Patients were sent to the post-anesthesia care unit (PACU) if their modified Aldrete score was greater than 9.

The Modified Observer's assessment of alertness/sedation scale (MOAS/S) was used in the ward and post-anesthesia care unit after the discharge from PACU[14].

Using a scale from 0 (no pain) to 10 (the most severe pain), patients were evaluated for post-operative pain using the Numerical Rating Scale (NRS). Prior to surgery, patients were briefed on the NRS and its purpose. After the procedure, the NRS score was taken at 15, 30, and 60 minutes, as well as 2, 6, 12, and 24 hours. If the NRS score was equal to or greater than 4, an intravenous dosage of 4 mg of Nalbuphine was given as a rescue measure.

The entire number of Nalbuphine dosages were documented.

Hypoxia, severe nausea, and vomiting were documented as postoperative complications.All patients were assessed for Postoperative nausea & vomiting PONV. After 15 minutes, 6, 12, and 24 hours of waking up from general anesthesia, participants were assessed again.The patients were assessed for first time to require analgesia and total analgesic requirements for 24 h.

Data Collection:

Patient characteristics (name, age, BMI, ASA physical status), Intraoperative vital signs :systolic blood pressure ,heart rate and oxygen saturation were recorded every 5 minute till the end of the surgery,
(Primary outcome) : total dose of fentanyl used intraoperative. (Secondary outcomes): time taken for extubation, Post-anesthesia care unit (PACU) stay time (the time from arrival of patients to the PACU till discharge from it) using Aldrete score for evaluating the patient.Assessment MOAS score after 10, 30 and 60 minutes.Assessment of NRS score at 15, 30, and 60 min and 2, 6, 12, and 24 h after the surgery.The incidence of postoperative complications such as hypotension, hypertension, tachycardia , bradycardia , nausea and vomiting , the severity will be evaluated at (6,12,24) hour after arrival to the ward in each group. First time to require analgesic (time from recovery until first time the patient require analgesic) and Total rescue analgesic requirement for 24 h.

STATISTICAL ANALYSIS

The latest version of SPSS (Statistical Package for the Social Sciences) was used to conduct the data analysis. We used the absolute frequencies to characterize the categorical variables, and we compared them with chi-square tests and, when necessary, Monte Carlo tests. To ensure the validity of the assumptions used in parametric testing, the Kolmogorov-Smirnov test was employed. Means, standard deviations, medians, and interquartile ranges were used to characterize quantitative variables, depending on the type of data.We utilized the Kruskal Wallis test (for data that does not follow a normal distribution) and the one-way ANOVA test (for data that does follow a normal distribution) to compare quantitative data between the two groups. Pairwise comparison and Tukey HSD were employed to find differences between each individual group when the difference was significant. We regarded a p-value of less than 0.05 to be statistically significant.

RESULTS

The mean age of included patients in Group C, Group D, and Group K was 43.08 ± 12.61, 4.65,49.62 ± 14.39 and 45.88 ± 12.38years old, respectively.Non-Statistically significant differences were revealed between the three studied groups as regards age, gender, ASA or comorbidities(Table 1).

The Dexmedetomidine group showed highly significant ($p<0.001$) lower systolic blood pressure than the Ketamine group at 10, 15, 45, 60, 105 & 120 minutes. The Ketamine group showed highly significant higher ($p<0.001$) systolic blood pressure than the other two groups at 60 minutes (Figure 1A).

The Dexmedetomidine group showed highly significant ($p<0.001$) lower diastolic blood pressure than the other two groups at 10, 15 and 120 minutes. The Dexmedetomidine showed highly significant ($p<0.05$) lower diastolic blood pressure than the ketamine group at 30, 45, 60, 75 and 105 minutes. The Ketamine group showed highly significant ($p<0.001$) higher diastolic blood pressure than the control group at 30 ,75 and 90 minutes. The Ketamine group showed significant ($p<0.05$) higher diastolic blood pressure than the control group at 15, 60 and 105 minutes(Figure 1B).

The Dexmedetomidine showed highly significant ($p<0.001$) lower heart rate than the Control group at 15 ,30,45,90,105 and 120 minutes. The Dexmedetomidine showed significantly ($p<0.05$) lower heart rate than the Ketamine group at 15,30,45,60,75 and 120 minutes. The Ketamine group showed significantly ($p<0.05$) higher heart rate than the Control group at 30,45,60 and 105 minutes(Figure 1C).

There was statistically highly significant difference between the studied groups regarding MOAS\S score immediately and at 10 minutes postoperatively. On doing pairwise comparison, difference is significant between Dexmedetomidine group and each other group. The Dexmedetomidine group showed highly significant ($p<0.001$) better MOAS\S score than the other two groups

immediately postoperative and then control group after 10 minutes. The Dexmedetomidine group showed significant ($p<0.05$) better MOAS\S score than the Ketamine group 10 minutes postoperative (Table 2).

The Ketamine group had highly significant ($p\leq0.001$) better NRS score than the control group at 60 minutes and 2 hours. The Ketamine group had significant ($p\leq0.05$) better NRS score than the Dexmedetomidine group at 6, 12 hours. The Dexmedetomidine group had significant ($p<0.05$) than the control group at 2, 15, 30 and 60 minutes(Figure 1D).

The Dexmedetomidine group showed less total intraoperative fentanyl dose, less time for extubation and less time for PACU stay than the other two groups.The control group needed highly significant ($P \leq0.001$) higher amount of interoperative Fentanyl than the Dexmedetomidine group and significantly ($P <0.05$) higher than the Ketamine grouppostoperative (Table 3).

The Ketamine group needed highly significant ($P \leq0.001$) longer time to first require analgesic than the control group and significantly ($P <0.05$) longer than the Dexmedetomidine group. The Ketamine group needed highly significant ($P \leq0.001$) lower total rescue Nalbuphine dose than the other two groups and Dexmedetomidine group had highly significant ($P \leq0.001$) lower dose than the control group (Table 4).

At 6 and 12 hours, Dexmedetomidine group showed less incidence of nausea, and hypotension at 6 hours as compared to other groups. Dexmedetomidine group showed less incidence of vomiting at 6, 12 and 24 hours.Control group showed highest incidence of nausea at 24 hours, hypotension at 24 hours and tachycardia at 6 and 12 hours.Ketamine group showed no hypotension at 12 hours which was significant when compared to other group.(Figure 1E).

Table (1) :Comparison between the studied groups regarding demographic data

	Control group	**Dexmedetomidine group**	**Ketamine group**	**F**	**p**
Age (year) Mean ± SD	43.08 ± 12.61	49.62± 14.39	45.88 ± 12.38	1.616	0.205
	N=26	**N=26**	**N=26**	**χ^2**	**p**
Sex: **Male** **Female**	 14 (53.8%) 12 (46.2%)	 10 (38.5%) 16 (61.5%)	 15 (57.7%) 11 (42.3%)	 2.154	 0.341
ASA: **I** **II**	 19 (73.1%) 7 (26.9%)	 16 (61.5%) 10 (38.5%)	 18 (69.2%) 8 (30.8%)	 0.824	 0.662
Comorbidities: **Diabetes** **Hypertension** **Hypothyroidism**	 4 (15.4%) 5 (19.2%) 5 (19.2%)	 5 (19.2%) 8 (30.8%) 3 (11.5%)	 8 (30.8%) 5 (19.2%) 0 (0%)	 1.956 1.3 MC	 0.376 0.522 0.103

Table (2) :Comparison between the studied groups regarding MOAS\S score

	Control group	**Dexmedetomidine group**	**Ketamine group**		**KW**	**p**
	Median (IQR)	**Median (IQR)**	**Median (IQR)**	**pairwise**		
Postoperative	3(3 – 4)	4(4 – 5)	4(3 – 4)	**P_1<0.001**** **P_2<0.001**** P_3 0.173	33.748	<0.001**

	Control group	Dexmedetomidine group	Ketamine group		KW	p
	Median (IQR)	Median (IQR)	Median (IQR)	pairwise		
10 minutes	4(4 – 4)	5(5 – 5)	4(4 – 5)	**P_1<0.001**** **$P_2$0.007*** P_3 0.289	22.819	<0.001**
30 minutes	5(5 – 5)	5(5 – 5)	5(5 – 5)		1.013	0.603
60 minutes	5(5 – 5)	5(5 – 5)	5(5 – 5)		1.013	0.603

**p≤0.001 is statistically highly significant
*p<0.05 is statistically significant

Table (3) Comparison between the studied groups regarding intraoperative total fentanyl dose, time of extubation and PACU stay:

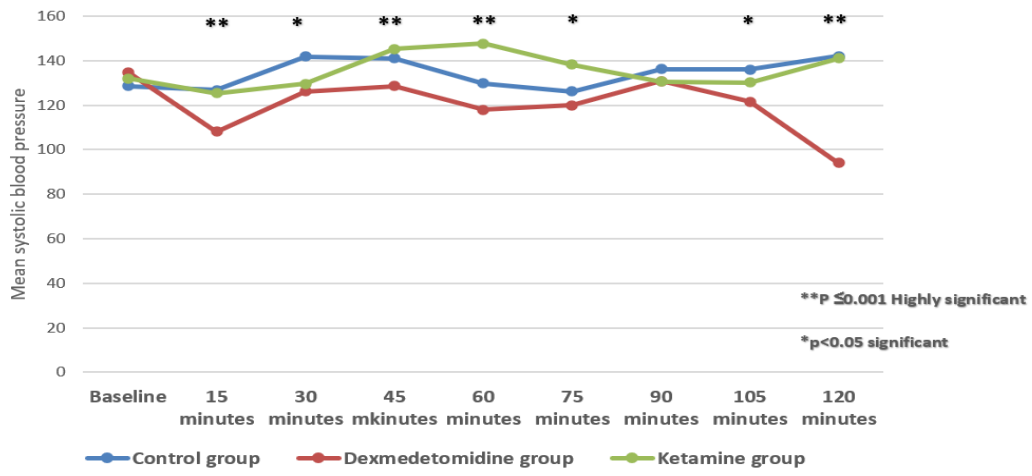
	Control group	Dexmedetomidine group	Ketamine group		F	pP
	Mean ± SD	Mean ± SD	Mean ± SD	Tukey HSD		
Total fentanyl dose (µg)	170.58 ±19.25	130.77 ± 29.42	156.35 ±23.67	**P_1<0.001**** **P_2 0.001*** P_3 0.097	17.66	<0.001**
Time to extubation(min)	4.69 ± 1.05	3.54 ± 0.71	4.58 ± 0.95	**P_1<0.001**** **P_2<0.001**** P_3 0.892	12.6	<0.001**
PACU stay (min)	9.23 ± 0.99	6.92 ± 1.45	9.04 ± 1.28	**P_1<0.001**** **P_2<0.001**** P_3 0.847	26.771	<0.001**

**p≤0.001 is statistically highly significant
*p<0.05 is statistically significant

Table (4) Comparison between the studied groups regarding time and amount of rescue analgesia

	Control group	Dexmedetomidine group	Ketamine group		KW	p
	Median(IQR)	Median(IQR)	Median(IQR)	Pairwise		
First time to need analgesia (hours)	1(1 – 3)	5(4 – 6)	6(6 – 7)	P_1 0.013* P_2 0.074 P_3<0.001**	54.513	<0.001**
Total dose of Nalbuphine (mg)	12(9.5 – 14)	6(6 – 6.5)	4(2 – 4)	P_1 0.001** P_2<0.001** P_3<0.001**	60.486	<0.001**

**p≤0.001 is statistically highly significant *p<0.05 is statistically significant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Dexmedetomidine group
Ketamine group

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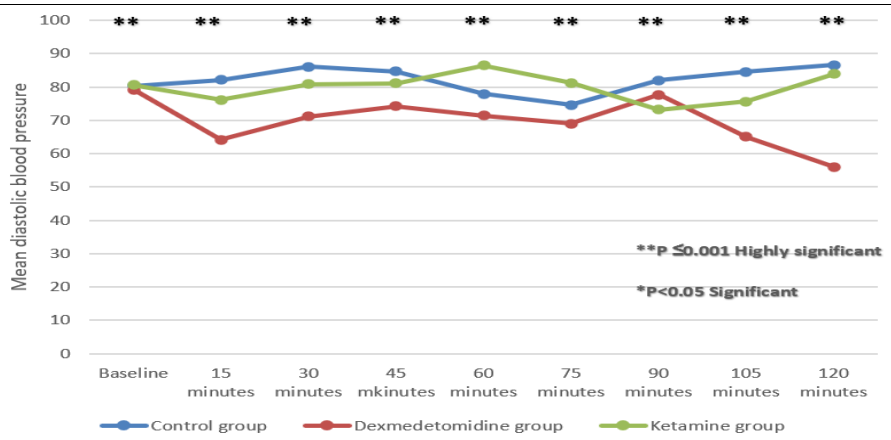
Mean diastolic blood pressure
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*P<0.05 Significant
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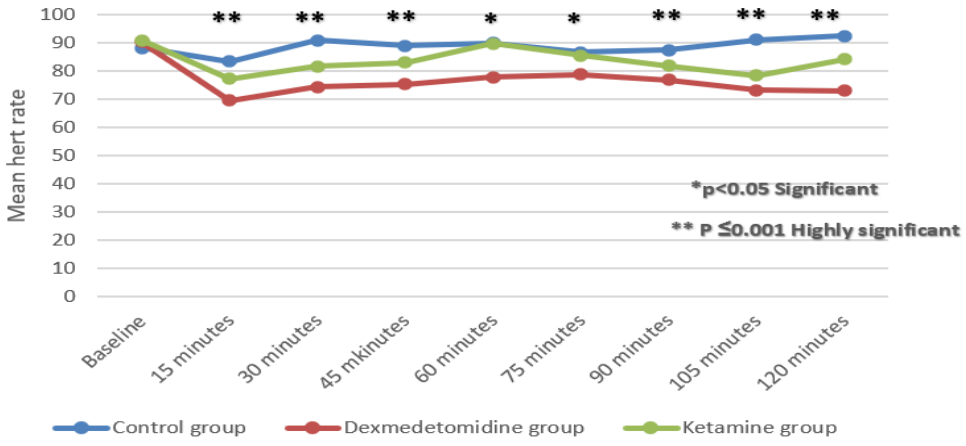
Control group
Dexmedetomidine group
Ketamine group

B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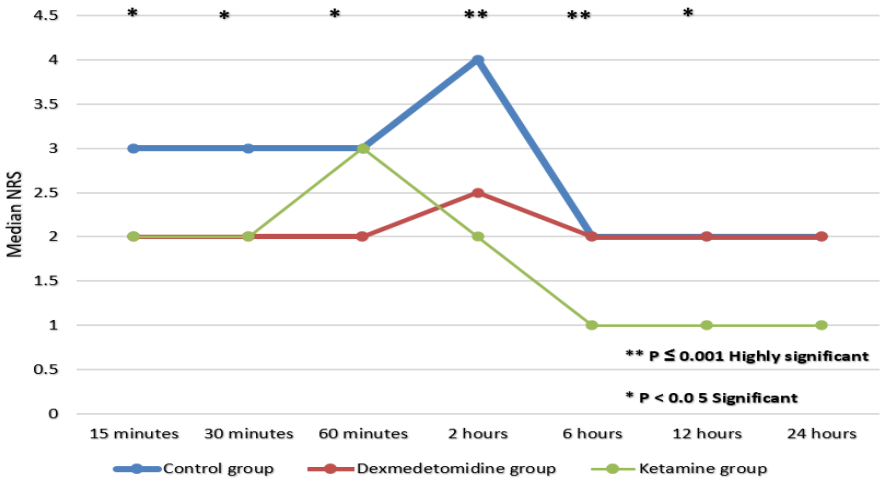
Ketamine group

C



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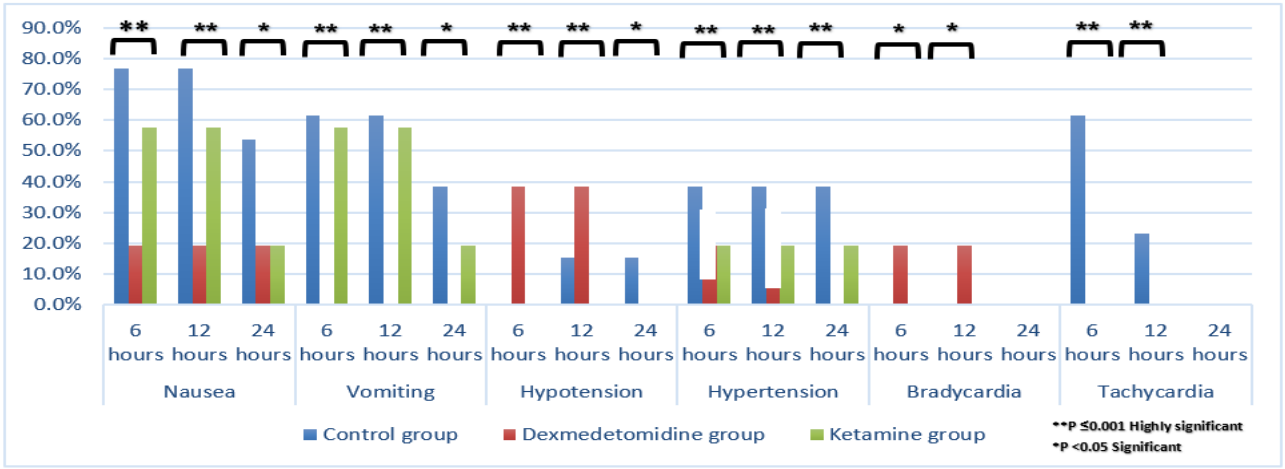

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Figure 1: Line Charts for (A):comparison between groups regarding systolic blood pressure, (B): comparison between groups regarding diastolic blood pressure, (C): comparison between groups regarding heart rate, (D): comparison between the studied groups regarding NRS score, (E): comparison between groups regarding postoperative complications.

DISCUSSION

Obese cases are more likely to experience adverse effects from opioid analgesics, making their use problematic. For example, 65% of obese patients experienced nausea and vomiting after surgery, compared to 35% of non-obese patients [15].

The Present study demonstrated that the group who received dexmedetomidine showed lower systolic, diastolic blood pressure than the other two groups and lower heart rate within normal range, no patients needed rescue drug. One possible explanation for this, within the medullary vasomotor center, it stimulates inhibitory neurons and lowers plasma catecholamine levels [16].The ketamine group showed higher diastolic pressure than the other two groups.

The results of this study were in accordance withTufanogullari et al. [17]regardinghemodynamics, demonstrated that use

of Dexmedetomidine infusion during laparoscpic bariatric surgeries lowered the mean arterial blood pressure intraoperative and early postoperative in three groups who received different doses of dexmedetomidine (0.2 ugm\kg\h , 0.4 ugm\kg\h and 0.8 ugm\kg\h) than the group who recived placebo.

This agreed with Zeeni et al. [18]who found that during laparoscopic bariatric procedures, a group that received a bolus of Dexmedetomidine at a dose of 1 μg/kg over 10 minutes and then 0.5 μg/kg/h until the laparoscope was removed had significantly lower intraoperative systolic and diastolic blood pressures than a group that received morphine for pain.

The present study revealed that DBP was higher in the group who received ketamine in agreement with Khalil et al. [19]who compared between dexmedetomidine versus ketamine infusion for analgesia among obese cases who undergone bariatric surgeries and demonstrated that analgesic effects of dexmedetomidine were supported by lower reported HR values in the dexmedetomidine group, likely due to decreased sympathetic outflow, and greater intraoperative MAP in the ketamine group compared to the other groups.

While in contrast with Nikoubakht et al. [20]who found that there was no significant difference among a group who received Dexmedetomidine (0.2 mcg/kg/h infusion), a group who received Ketamine (0,1 mg \Kg\h) and a group who received placebo regarding hypotension and bradycardia in spine surgeries

The total fentanyl requirement intraoperative was the least in Dexmedetomidine group and both Ketamine group and Dexmedetomidine group need significantly less opioid interoperative than the control group in our study. The fact that it is an Alpha-2 agonist may account for this, since this type of receptor blocks nociceptive neurotransmission via the spinal cord's posterior horn in the locus ceruleus region [21].

In the present we found that Dexmedetomidinesignificantly lowered the time for extubation and the PACU stay than the other two groups. This is in agreement with Khalil et al. [19]who found that the group given dexmedetomidine had a significantly shorter time to extubation compared to the other groups.

Also, in accordance with Feld et al. [22]who found that time for extubation and PACU stay were much shorter in the Dexmedetomidine group than the group that received fentanyl and one of the patients of the fentanyl group remained intubated for 30 minutes in PACU.

This is in contrast with Ranganathan et al. [23]who used interaoperative Dexmedetomidine (single bolus of 1 ugm\kg over 10 minutes) in Roux en Y gastric bypass and found no significant change in the time of PACU stay between the active drug and the placebo group.

The present study findings revealed that the dexmedetomidine group had a better Modified observer's assessment alertness\sedation scale (MOAA\S) immediately postoperative and after 10 minutes than ketamine and control group. This was in accordance with Garg et al. [24]who stated that "Patients given dexmedetomidine can experience what is called "arousable sedation," in which they are still sedated but are able to reply verbally to instructions."

This was in contrast withGe et al. [25]who used the Ramsay sedation scale to assess the sedation in a group of patients who received Dexemedetomidine infusion(0.4μg/kg/hour) in abdominal colectomy and found that this group had higher score than the group received saline and stated that Consistent with earlier research, they found that intraoperative DEX produced a more stable anesthetic without altering the hemodynamic characteristics; furthermore, they found that the sedation score was significantly greater in the Dexmedetomidine group both during and immediately following extubation.

The Present study demonstrated that Numerical Rating score (NRS) was better up to 12 hours in the Ketamine group than the Dexmedetomidine group. One possible explanation for ketamine's analgesic effects is its antagonistic effect on the NMDA receptor.Additionally, NMDA receptors promote tissue damage that leads to central nociceptive system sensitization, and ketamine abolishes this effect. In their study, Garg et al. [24]In addition, the CYP450 enzyme quickly breaks down Dexmedetomidine, and its half-life is 2 to 2 1/2 hours [26].

These resultswere in accordance with Garg et al. [24]who found that The active drug groups showed a significant decrease in pain score compared to the

control group, with the exception of the first zero hours following surgery. The ketamine group had the lowest, while the dexmedetomidine group had similar results. Also, we agreed with Khalil et al. [19]who revealed that as a result of much reduced NRS scores and morphine intake, the ketamine group stood out from the others.".

But in contrast with Ali et al. [27] who demonstrated that a group of patients who received Ketamine shown a higher Visual Analogue Score VAS higher than a group who received morphine during abdominoplasty. Also, in disagreement with Zeeni et al. [18]who found that there is no difference in NRS score between a group of patients who received Dexmedetomidine and a group who received Morphine and explained it by that both of the drugs are lipophilic drugs which prolongs their half life in obese patints and hence the analgesic effect.

The primary issue of our is study is to reduce opioid consumption in obese patients to avoid postoperative complications and to provide strong analgesic agents other than opioids and we found that Ketamine achieved the longest time to require rescue Nalbuphine for the first time and the lowest dose of postoperative analgesic and the Dexmedetomidine achieved longer time and less dose than the control group.

This is in agreement with Seman et al. [28]who found that Ketamine reduced the posoperative opioid use and the PCA morphine use. Also provided a questionnaire about patient satisfaction that demonstrated better pain relief and better overall satisfaction in the first 24 h postoperative with Ketamine group.

In disagreement with Ali et al. [27] who found that Ketamine had a morphine-like practical analgesic effect during abdominal augmentation. It has the same analgesic effect as fentanyl and morphine. Nevertheless, it did not decrease fentanyl intake in the four hours following surgery.

The present study revealed that the Dexmedetomidine group was the least among the 3 groups in postoperative nausea and vomiting. This was in agreement withGurbet et al. [29] who found that postoperative nausea and vomiting were less in a group of patients who received Dexmedetomidine infusion than a group who received placebo. But in disagreement with Naik et al. [30]who demonstrated that incidence of nausea and vomiting was higher in a group who received Dexmedetomidine than the group who received placebo in major spine surgery.

Limitations:

The current study had some limitations. Firstly, the sample size might be relatively small, with 78 subjects. The results may not apply to a broader population because of this. Secondly, since the study was conducted in a specific hospital, there was a potential for selection bias. The patient population might not fully represent the diversity and characteristics of all obese individuals who undergone abdominal Surgeries. This could affect the external validity of the study.

CONCLUSION

Ketamine and dexmedetomidine can effectively manage pain in obese patients undergoing abdominal surgery. Dexmedetomidine improves clinical outcomes in the intraoperative period, while ketamine improves analgesia in the postoperative period. In addition, dexmedetomidine may improve postoperative recovery in terms of sedation and PONV.

CONFLICTS OF INTREST

No potential conflict of interest was reported by the authors.

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