Dexmedetomidine Versus Fentanyl Infusion as Adjuvants to General Anesthesia Using Sevoflurane in Laparoscopic Bariatric Surgery

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Abstract

Background: Opioids have been used in the intraoperative and postoperative management in bariatric surgery patients. However, with the increasing use of Dexmedetomidine alpha-2 stimulant, we designed this study to compare the intraoperative and early postoperative effects of both methods, regarding hemodynamic, respiratory, sedative effects and rate of morbidity.

Methods: Eighty bariatric patients were randomly recruited into the study after obtaining local ethical committee approval and written informed consent. Patients were randomly allocated to either Group F: (40 patients) received fentanyl infusion as Intra-operative analgesia and Group D: (40 patients) received Dexmedetomidine infusion. Both groups were compared as regarding intra-operative hemodynamics, time from cessation of anesthesia to recovery, immediate post-operative pain score.

Results: The study included 80 bariatric patients underwent laparoscopic weight reduction surgeries. Dexmedetomidine group showed better intra-operative hemodynamic parameters, shorter recovery time, lower immediate post-operative pain scores and less respiratory depression than fentanyl group (p-value 0.001).

Conclusion: In comparison to fentanyl, Dexmedetomidine provided significantly lower pain scores, lower respiratory depression and shorter recovery time than fentanyl.

Key Words: Dexmedetomidine – Fentanyl – Bariatric anesthesia – Sevoflurane.

Introduction

LAPAROSCOPIC bariatric surgeries are widely used for treating obesity with laparoscopy is offering early mobilization and reduced hospital stay, but the associated pneumoperitoneum may lead to intraoperative cardiovascular instability [1]. Especially in morbidly obese patients with associated hyperlipidemia, atherosclerosis, possible hypertension and ischemic heart disease which raises the possibility of cardiac complications and makes the hemodynamic stability crucial. These patients are at high risk for perioperative cardiopulmonary dysfunction and mortality due to decreased pulmonary volume and compliance and to increased oxygen consumption, which are responsible for a high incidence of atelectasis and hypoxemia [2].

Optimal anesthetic technique objectives include early anesthetic recovery, minimum effects on respiratory function allowing for early extubation [2] and possibility of postoperative physical therapy [3].

The addition of drugs such as fentanyl and dexmedetomidine to the anesthetic technique, allows for early return to previous consciousness level and respiratory function recovery, would help early mobilization, thus increasing morbidly obese patients’ safety [2].

Clonidine is (x2-adrenergic receptor agonist that has been widely used as an analgesic adjuvant in perioperative conditions and pain therapy. Dexmedetomidine is currently the most potent (x2 agonist available and was first approved as a sedative agent for use in the intensive care unit. However, Dexmedetomidine has been recently investigated for its analgesic effects and has the potential to become an alternative to clonidine [4].

Dexmedetomidine belongs to the same family but presents with a different, more favorable pharmacokinetic profile. Dexmedetomidine was first introduced into clinical practice as a short-term intravenous sedative in the intensive care unit. Because the drug also demonstrates analgesic properties related to (x2 binding, several studies have investigated its use as a systemic analgesic adjuvant, mostly in the acute perioperative setting [8]. Dexmedetomidine is a highly selective (x2 agonist drug, is approved as an intravenous sedative and co-analgesic drug. Its use is often associated with a decrease in heart rate and blood pressure [6].
Recent experimental studies seem to show that $\xi_1$-AR activity counterbalances $\xi_2$-AR-induced analgesia and, therefore, greater $\xi_2$-AR selectivity may enhance the therapeutic window of $\xi_2$-AR in the treatment of pain [7].

Fentanyl is a lipophilic $\gamma$-receptor agonist opioid. Intrathecal fentanyl exerts its effect by combining with opioid receptors in the dorsal horn of spinal cord and may have a supra-spinal spread and action [8]. It has a rapid onset of action (5 minutes) and relatively short duration of action due to redistribution (2-4 hours). It has no active metabolites and is approximately 800 times more lipid soluble than morphine. It has a long terminal elimination half-life (190 minutes) and repeated high doses may result in accumulation and delayed respiratory depression are not uncommon [9,10].

Fentanyl results in early emergence due to its metabolism by plasma and tissue esteras, in addition to potentiating spinal morphine analgesic effects [11]. It has already been shown that the $\xi_2$-adrenergic agonist dexmedetomidine has not interfered with respiratory patterns providing residual analgesia, thus being considered safe for continuous intravenous infusion [12,13].

Inhaled anesthetic, sevoflurane, have low blood gas partition coefficients, and therefore share the advantage of faster onset and offset of anesthesia as compared with older inhaled anesthetics like halothane and isoflurane. Sevoflurane appears to yield a more rapid recovery because of its pharmacological properties [1].

Open Roux-en-Y Gastric Bypass (RYGBP) has proven to be an effective method for weight control for the morbidly obese patient. With technologic and surgical skill advancement in the application of laparoscopic surgery, laparoscopic RYGBP has also been found to be of value in surgical control of obesity [14].

Benefits of laparoscopic RYGBP, as compared with open RYGBP, include decreased postoperative pain, reduction of postoperative pulmonary dysfunction, less intraoperative blood loss, shorter intensive care and hospital stays, and an earlier return to daily activities [15].

The choice of anesthetic technique for general anesthesia in morbidly obese patients remains controversial [16].

Our study aimed at comparing fentanyl and dexmedetomidine as adjuvants of standardized anesthetic technique in morbidly obese patients submitted to laparoscopic bariatric surgery [17] and to compare hemodynamic stability and recovery characteristics of sevoflurane in bariatric surgery.

**Patients and Methods**

A prospective, randomized, double blinded study was conducted at King Fahad General Hospital (Jeddah, KSA) during 2015 after approval by the local research and ethics committee and a written informed consent was obtained from the patients included in the study.

The study recruited 80 obese patients scheduled for laparoscopic Roux-en-Y gastric bypass (RYGBP) surgery. The inclusion criteria were: (1) Age 21-49 years, (2) Body Mass Index of <60, and (3) American Society of Anesthesiologists (ASA) physical status I and II who underwent gastric bypass surgery. The exclusion criteria were: (1) Patient age <21 or >49 years, (2) Preoperative hypotension (mean arterial blood pressure <60 mmHg), (3) Preoperative bradycardia (heart rate <45 beats/min), (4) Preoperative dysrhythmia, (5) Uncontrolled hypertension, (6) Clinically significant cardiovascular, neurologic, renal or hepatic diseases, (7) Allergy to alpha-2 stimulant drugs. (8) Cognitive impairment or language barriers and patients.

A computer generated numbers were used for randomization and both the patient and attending anesthesiologists were unaware of the type of the infusion used for blinding.

The 80 patients were randomly allocated to one of the two study groups, Group F: Fentanyl (FEN) group (n=40) and Group D: Dexmedetomidine (DEX) group (n=40).

Echocardiogram and pulmonary function tests were added to routine preoperative evaluation. All patients received general anesthesia in the operating theatre after care the night before surgery included oral pre-anesthetic medication (10mg metoclopramide, 150mg ranitidine or 20mg omeprazole) and 40mg subcutaneous sodium enoxaparin. Oral medication was repeated two hours before the procedure, associated to 8mg Ondansetron. Peripheral venous access was obtained in the preoperative room with 18G catheter and radial artery was catheterized with 20G catheter for mean blood pressure monitoring. Following pre-oxygenation with 100% oxygen for 5 minutes and application of standard monitoring (ECG, NIBP, and pulse oximetry) a rapid sequence induction were performed by propofol 2mg/kg and rocuronium 1.2 mg/kg with cricoid pressure applied till endotracheal intubation was confirmed by capnography.
Anesthesia was maintained by Sevoflurane inhalation, its concentration was regulated as guided by Bispectral Index Scale (BIS) values (40-60) and to keep cardiovascular parameters within ±25% from the baseline.

Study drugs (Dexmedetomidine or fentanyl) were prepared in 50ml syringes by another anesthesiologist with the anesthetist attending the case was blinded to the syringe. The weight adjusted doses of used drugs were based on the patients' actual body weight.

In group DEX, Dexmedetomidine infusion started at a rate of (0.6 µg/kg/h) after induction of anesthesia and was continuously infused until the end of surgery. In group FEN, Fentanyl infusion started and continuously infused at a rate of (1.5 µg/kg/h) until the end of surgery.

Anesthesia was initially maintained by inhalation of 3% Sevoflurane in a mixture of O2/Air (50/50). Pressure controlled ventilation used with minimal pressure achieving a tidal volume of 10 ml/ideal body weight at a rate of 12 breaths/minute, guided by end-tidal CO2 (EtCO2) at 35-40mmHg with an I:E ratio of 1:2. Additional Rocuronium (0.1 mg/kg) was administered under the guidance of peripheral neuromuscular monitoring in both groups. BIS values were maintained at 40-60. Hypotension (MAP value <25% of baseline value) was treated by ephedrine 3-5mg IV shots, bradycardia (HR value <30% of baseline value) was treated with Atropine 0.5mg IV shots and hypertension (MAP value >30% of baseline value) was treated by nitroglycerine 5-10 µg-IV shots. IV fluids were managed using the "4-2-1" rule in all the patients included in the study.

At the end of surgery, when the surgeons deflate the abdomen, all infusions were stopped, parenteral Paracetamol 1 gm was infused and pethidine 1 mg/actual body weight was given intramuscularly. Ondansetron 8mg IV shot was given to all patients.

Spontaneous ventilation was gradually regained atropine 0.02mg/kg and neostigmine 0.04mg/Kg were given as guided by the peripheral nerve stimulator. Tracheal extubation was performed after confirming sufficient recovery (TOF ratio >95%; BIS >80, ability to open the eyes, ability to obey anesthetist's verbal commands and ability to maintain a regular breathing pattern) and patients were then transferred to a post-anesthesia care unit. We recorded the time to extubation, sedation scores, recovery room stay and time to first “rescue” analgesic, then, 24 hours' fentanyl requirements for patient controlled analgesia and recovery of bowel function.

The following parameters were evaluated: (1) Intraoperative: Different anesthetic recovery times (eyes opening, return to spontaneous ventilation and tracheal extubation time. (2) Early postoperative effects: Time at post anesthetic recovery unit and hospital discharges; and (3) Hemodynamic and respiratory effects and rate of morbidity; and postoperative analgesia.

**Statistical analysis:**

Data analysis was performed using SPSS software, release 22. Statistical analyzes involved: Descriptive analyzes the significance test to check the normality of continuous variables, chi-square and correlation test to compare between both groups using the Kruskall-Wallis test to find relationship as regards of early postoperative effects of both methods, regarding hemodynamic, respiratory, sedative effects and rate of morbidity and other independent variables, and binary logistic regression. Also we compared the time to extubation, sedation scores, recovery room stay and time to first “rescue” analgesic between both groups, then, 24 hours' fentanyl requirements for patient controlled analgesia and recovery of bowel function. Chi square analysis was used to test for statistical significance. A p-value of ≤0.05 was considered statistically significant.

**Sample size calculation:**

Group sample sizes of 40 in Group D and 40 in Group F achieve 80% power to detect a difference between the group proportions of 0.31 (odds ratio of 4.4) regarding the hemodynamics, recovery time and pain scores. The proportion in Group D is assumed to be 0.5 under the null hypothesis and 0.81 under the alternative hypothesis. The proportion in Group F is 0.5. The test statistic used is the two-sided Fisher’s exact test. The significance level of the test was targeted at 0.05. The significance level actually achieved by this design is 0.03.

**Results**

Eighty patients were enrolled in the study and no dropouts occurred. Patient demographics are shown in Table (1). There was no difference in age, weight, height, body mass index, sex or ASA physical status, between the two groups.

The total amount of propofol required to maintain the target BIS level was significantly lower in the dexmedetomidine group compared with the fentanyl group. Dexmedetomidine proved to significantly maintain the hemodynamic stability as compared with the other group. The total amount of PCA morphine at two hours in the PACU and POD 1 were significantly lower in the dexmedeto-
midine compared with the Fentanyl group. Pain scores at one hour and two hours, blood pressure, and heart rate were significantly lower in the dexmedetomidine group in the PACU (Table 2).

Major co-morbidities found were similar for both groups and consisted of diabetes, blood hypertension, hypothyroidism, osteoporosis, joint wear, cigarette smoking, allergy, sleep apnea, lower limb varicose veins, arrhythmias, dyslipidemia, hiatus hernia, regular use of psychotropics, regular use of prescribed amphetamine-containing drugs to lose weight. Mallampati (Group F: 1.6 ± 0.88; Group D: 2 ± 1.07) and Cormack (Group F: 1.45 ± 0.88; Group D: 1.61 ± 0.97) classifications for tracheal intubation were similar for both groups (p > 0.05).

Times for eye opening, return to spontaneous ventilation and tracheal extubation were shorter for Group F as compared to Group D (p < 0.0001). There were, however, no differences in PACU and hospital discharge (Table 3).

Surgery duration was similar for both groups (213±63 min and 210±55 min for Groups F and D, respectively; p > 0.05). Inhaled anesthetic consumption (ml/hour) was also similar between groups (Group F: 5.04±1.12; Group D: 5.80±1.4; p > 0.05).

Duration to spontaneous respiration, adequate respiration and safe extubation showed no significant difference in the dexmedetomidine group compared with the Fentanyl group. These durations start from end of surgery and discontinuation of Propofol infusion (Table 4).

After discontinuation of volatile anesthetic, the time to recovery of parameters like reaction to painful stimuli, obeying verbal commands and spontaneous eye opening was significantly shorter in patients given sevoflurane (p = 0.001) (Table 5).

### Table (1): Demographic data in both groups.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group F (fentanyl)</th>
<th>Group D (dexmedetomidine)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)*</td>
<td>42±5</td>
<td>43±4</td>
</tr>
<tr>
<td>Weight (kg)*</td>
<td>126±25</td>
<td>127±28</td>
</tr>
<tr>
<td>Height (cm)*</td>
<td>165±9</td>
<td>165±11</td>
</tr>
<tr>
<td>BMI (kg.m-2)*</td>
<td>45.9±6.6</td>
<td>46.4±7.2</td>
</tr>
<tr>
<td>ASA (PS)</td>
<td>(24), (26), (12)</td>
<td>(26), (14)</td>
</tr>
<tr>
<td>Gender:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Female</td>
<td>30</td>
<td>28</td>
</tr>
</tbody>
</table>

* ASA (PS): ASA Physical Status with number of patients in parenthesis.

BMI: Body Mass Index.

* Data are presented as mean ± SD and were analyzed using Kruskal-Wallis test. (p < 0.05 = statistical significance).

### Table (2): Measurements made at the end of surgery (mean ± SD).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group F (fentanyl)</th>
<th>Group D (dexmedetomidine)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PACU pain score (0-10, 1h)</td>
<td>6 (5-8)</td>
<td>3 (2-4)*</td>
</tr>
<tr>
<td>PACU pain score (0-10, 2h)</td>
<td>5 (2-5)</td>
<td>2 (1-3)*</td>
</tr>
<tr>
<td>PACU morphine (mg, 2h)</td>
<td>10.2±1.3</td>
<td>5±1.4*</td>
</tr>
<tr>
<td>Total amount of morphine (mg, PODI)</td>
<td>47.8±8</td>
<td>35.4±6.4*</td>
</tr>
<tr>
<td>PACU mean blood pressure (mm Hg, 1h)</td>
<td>91 ±11</td>
<td>71 ±11*</td>
</tr>
<tr>
<td>PACU heart rate (min-1, 1h)</td>
<td>87±11</td>
<td>71±8*</td>
</tr>
<tr>
<td>Total amount of intraoperative propofol (mg)</td>
<td>2162±454</td>
<td>1447±310*</td>
</tr>
</tbody>
</table>

Data are expressed as mean (range). * p < 0.05 is considered as statistically significant.

### Table (3): Post-anesthetic evolution.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group F (fentanyl)</th>
<th>Group D (dexmedetomidine)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergence (Min.)</td>
<td>9.49±5.61</td>
<td>18.25±10.24 &lt;0.0001</td>
</tr>
<tr>
<td>Spontaneous ventilation (Min.)</td>
<td>9.78±5.80</td>
<td>16.58±6.07 &lt;0.0001</td>
</tr>
<tr>
<td>Tracheal extubation (Min.)</td>
<td>17.93±10.39</td>
<td>27.53±13.39 &lt;0.0001</td>
</tr>
<tr>
<td>Conditions for PACU discharge (Min.)</td>
<td>105.13±50.82</td>
<td>118.69±56.19 0.064</td>
</tr>
<tr>
<td>Hospital discharge (hours.)</td>
<td>51.13±6.37</td>
<td>52.50±7.09 0.082</td>
</tr>
</tbody>
</table>

Data expressed in Mean ± SD. p < 0.05 is considered as statistically significant.

### Table (4): Recovery profile in minutes (mean ± SD).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group F (fentanyl)</th>
<th>Group D (dexmedetomidine)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response to verbal commands</td>
<td>3.6±0.5</td>
<td>3.5±0.6</td>
</tr>
<tr>
<td>Spontaneous respiration</td>
<td>3.2±0.6</td>
<td>3.3±0.4</td>
</tr>
<tr>
<td>Adequate respiration</td>
<td>4.3±0.6</td>
<td>4.1±0.5</td>
</tr>
<tr>
<td>Safe extubation</td>
<td>5.5±0.6</td>
<td>5.1±0.7</td>
</tr>
</tbody>
</table>

Data expressed in Mean ± SD. * p < 0.05 is considered as statistically significant.

### Table (5): Early and intermediate recovery after use of sevoflurane.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group F (fentanyl)</th>
<th>Group D (dexmedetomidine)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response to painful stimuli (min.)</td>
<td>6.75±4.2</td>
<td>0.000*</td>
</tr>
<tr>
<td>Response to verbal commands (min.)</td>
<td>7.45±4.54</td>
<td>0.001*</td>
</tr>
<tr>
<td>Spontaneous eye opening (min.)</td>
<td>8.5±5.708</td>
<td>0.001*</td>
</tr>
<tr>
<td>Stating name (min.)</td>
<td>10.8±6.78</td>
<td>0.059*</td>
</tr>
<tr>
<td>Stating date of birth (min.)</td>
<td>11.25±7.1</td>
<td>0.045*</td>
</tr>
<tr>
<td>Stating place of stay (min.)</td>
<td>11.25±7.06</td>
<td>0.059*</td>
</tr>
<tr>
<td>Sequence of fingers (min.)</td>
<td>12.3±7.1</td>
<td>0.088*</td>
</tr>
<tr>
<td>Lift limb (min.)</td>
<td>11.9±7.9</td>
<td>0.071*</td>
</tr>
</tbody>
</table>

Data expressed in Mean ± SD. * p < 0.05 is considered as statistically significant.
Discussion

The increasing incidence of morbid obesity is a crisis in national healthcare, which has precipitated an increase in bariatric surgery. Anesthetic management of morbidly obese patients poses a challenge to the anesthesiologist [18].

Prevalence of a difficult airway, risk for aspiration, pulmonary embolus, and consideration of concomitant disease in morbidly obese patients, have been previously described [5-8]. The incidence of obstructive sleep apnea and decreased tissue oxygenation is high in morbidly obese patients, increasing the risk of morbidity and mortality due to inadequate postoperative ventilation [19].

Obese patients may be sensitive to the respiratory depressant effect of opioid analgesic drugs and more likely to require postoperative ventilation to avoid hypoxic episodes. It has been recommended that opioid drugs be avoided for analgesia in the morbidly obese patient because of the risk of respiratory depression [20].

This requires that alternative drugs be used in place of opioids to provide analgesia during surgery. Several drugs, including clonidine, ketamine, magnesium, lidocaine, ketorolac, and steroids have all been shown to be analgesic [21].

Dexmedetomidine is a specific $\alpha_2$-adrenergic receptor agonist with antinociceptive and sedative properties that has been approved by the Federal Drug Administration for 24-hour sedation in the Intensive Care Unit. Reports indicate that Dexmedetomidine decreased anesthetic requirements during surgery, provided postoperative analgesia, and decreased morphine use in the Post-Anesthesia Care Unit (PACU). In addition, Dexmedetomidine alone produced minimal respiratory depression [22].

The results of this study showed that the use of dexmedetomidine decreased the total amount of intraoperative Propofol required for maintenance of anesthesia during laparoscopic gastric bypass procedures. Patients received Dexmedetomidine showed better control of intraoperative and postoperative mean blood pressure, heart rate. In the postoperative period, dexmedetomidine decreased pain scores and PCA morphine use and use of sevoflurane showed better recovery profile.

Ten percent of morbidly obese patients have severe respiratory impairment such as obesity hypoventilation syndrome while over 50% have moderate or severe sleep apnea [23].

Upper abdominal surgery is a risk for impaired pulmonary function after surgery and this effect is compounded by the elevated rate of obstructive sleep apnea in morbidly obese patients [24].

Laparoscopic RYGBP is a complex upper abdominal operation requiring advanced laparoscopic surgical dissection, advanced laparoscopic stapling skill, advanced laparoscopic intracorporeal stapling technique, and all performed in an environment of copious extra-and intra-abdominal adipose tissue [25].

Laparoscopic RYGBP is not only a technically difficult operation but also requires experience in preoperative and postoperative management of morbidly obese patients. The problem of respiratory depression and postoperative hypoxia in obese patients undergoing laparoscopic RYGBP is magnified by the use of narcotics during surgery and the need for opioids for postoperative pain control [26].

Opioids can be associated with potentially pronounced respiratory depressant effects in morbidly obese patients with OSA. Therefore, this patient population could benefit from a drug that can produce analgesic effects without significant or long lasting effects on respiratory function. Although other non-opioid drugs have been used to replace fentanyl during gastric bypass surgery in morbidly obese patients [27], the development of Dexmedetomidine, a highly specific $\alpha_2$-adrenergic agonist with an eight times higher affinity for the $\alpha_2$-adrenoceptor than clonidine, produced a class of sedative/analgesic drugs that could have advantages for the perioperative management of the obese patient.

Dexmedetomidine, with sedative/hypnotic, anesthetic-sparing, analgesic, and sympatholytic properties, has been approved for use in the management of patients in the ICU [28]; however, its role in contemporary intraoperative anesthesia practice has not yet been fully established.

The ability of Dexmedetomidine to decrease anesthesia requirements, better control of heart rate and blood pressure, and provide analgesia without respiratory depression has been reported before [22].

When infused at rates of 0.2 and 0.7 $\mu g \cdot kg^{-1} \cdot hr^{-1}$, dexmedetomidine produced clinically effective sedation and reduced the analgesic requirements of ventilated ICU patients.

There was no clinically apparent respiratory depression after cessation of assisted ventilation,
while at the same time Dexmedetomidine maintained a high degree of patient arousability [29].

Aho et al., [30] showed that, after laparoscopic tubal ligation, Dexmedetomidine relieved pain and reduced opioid requirements. In a subsequent study [31], the same authors confirmed that Dexmedetomidine infusion diminished Isoflurane requirement by >90%. When used in the ICU setting and given to intubated patients, Dexmedetomidine resulted in 80% less use of Midazolam, and 50% less use of Morphine compared with the control group [32].

In another study, Dexmedetomidine reduced Propofol requirements during bispectral index-guided sedation in the ICU and reduced morphine requirements by over 50% [33].

This is in agreement with the report by Arain et al., [34] who demonstrated a 66% reduction of postoperative Morphine requirements when using Dexmedetomidine.

The beneficial use of dexmedetomidine in Roux-en-Y gastric bypass surgery has been previously studied by other authors. Dresel et al., [35] showed that dexmedetomidine has shown a significant decrease in the use of narcotics and respiratory suppression when used for acute pain management after Roux-en-Y gastric bypass patients.

Hofer et al., [36] reported a morbidly obese patient whose intraoperative narcotic management was substituted entirely with dexmedetomidine. The narcotic sparing effects of dexmedetomidine were evident both intraoperatively (low isoflurane requirements) and postoperatively (lower total dose of self-administered PCA morphine).

Feld et al., [37] showed that dexmedetomidine could be used in place of fentanyl for intraoperative control of blood pressure and heart rate during open gastric bypass surgery. Dexmedetomidine treatment required less Desflurane than fentanyl to maintain anesthesia.

Our results confirm these previous reports and have shown that dexmedetomidine infusion reduced Propofol requirements by 33% during Bispectral index-guided anesthesia and resulted in 45% less use of intraoperative propranolol compared with fentanyl.

Our study showed similar results to the previous studies whereby dexmedetomidine decreased pain scores in PACU and decreased postoperative PCA morphine use by 50% in the first two hours and by 26% at the end of postoperative day.

Our study showed better recovery profile in the dexmedetomidine treated patients with sevoflurane infusion. Because a primary effect of dexmedetomidine is to decrease sympathetic activity [22], it was expected that the α2-adrenergic agonist would be effective in controlling intraoperative blood pressure. Our data confirm that dexmedetomidine decreased blood pressure and heart rate.

Conclusion:

The intraoperative infusion of dexmedetomidine may be an attractive option during laparoscopic RYGBP surgery as it decreased the total amount of propofol required to maintain anesthesia, offered better control of intraoperative and postoperative hemodynamics, decreased postoperative pain level and decreased the total amount of morphine used compared with placebo, thus attenuating the risk of narcotic induced postoperative respiratory depression and hypoxemia in morbidly obese patients.

Limitations:

The factors on morbidity cannot be assessed in this study, and the cross-sectional nature of the study creates difficulties in ascertaining casualty.

References


الملخص العربي

مقدمة: لقد استخدمت المواد الأنفيتية في أثناء العملية وبعد العملية الجراحية في مرضى جراحات علاج البدانة، ومع تزايد استخدام دواء النيكسوموديتيوميديين (منهآ إلفا 2). قمنا بتقسيم هذه الدراسة لمقارنة أثار كتلة الطرقاتتين أثناء العملية وما بعد الجراحة، بخصوص الدورة الدموية والجهاز التنفسي، والإثار المهيئة وملع الإصابة بالمضاعفات.

أسلوب البحث: تم التعيين العشوائي لثمانية مرضى بدانا في الدراسة بعد الحصول على موافقة لجنة أخلاقيات محلية وكتابة الموافقة مسبقاً. تم تخصيص المرضى عشوائياً إما المجموعة F (8 مريضاً) وتم تقسيم المريضين بالوريد ومجموعة D (4 مريضاً) تثقت ضخ عقار النيكسوموديتيوميديين بالوريد. وتمت مقارنة المجموعتين بنفس القدر فيما يتعلق بالعلامات الحيوية والوقت من وقف التخدير إلى الإفراقة وال`= إفراقة شدة الألم ما بعد الجراحة.

النتائج: شملت الدراسة خضع 8 مريضاً لعمليات البدانة بالمنظور لتخفيف الوزن. أظهرت مجموعة النيكسوموديتيوميديين نتائج أفضل من حيث نزول التعب والحرارة، وسرعة الإفراقة، وأقل درجات الألم بعد العمليات الجراحية، من مجموعة الفنتانيل.

الخلاصة: في المقارنة مع الفنتانيل، أظهر النيكسوموديتيوميديين درجات أقل بكثير، ودرجات أقل من حيث إبطاء الجهاز التنفسي وأقصر وقت الإفراقة من الفنتانيل.