A Comparative study between inhalational anesthesia with sevoflurane and T.I.V.A with dexmetomedin and remifentanyl for morbidly obese patient in laparoscopic surgery for morbid obesity.

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Citation

R Daas, M Saleh, B Abd-Alhdi, O Alhomos. *A Comparative study between inhalational anesthesia with sevoflurane and T.I.V.A with dexmetomedin and remifentanyl for morbidly obese patient in laparoscopic surgery for morbid obesity.*. The Internet Journal of Anesthesiology. 2008 Volume 22 Number 1.

Abstract

Aim: Anesthesia for morbidly obese patients is a challenge for every anesthesiologist .weaimed in this study to find a better way of anesthetizing such patients with multiple co-morbidities.
Method: Fifty morbidly obese patients, ASA I, planned to undergo laparoscopic gastric bandingwere randomly selected and distributed into tow groups 25 patient each. Anesthesia wasinduced by fentanyl 1 mg /kg, propofol 1.5 mg/kg, rocuronium 0.9mg/kg.anesthesia wasmaintained in the first group with sevoflorane along with O2 70% in 30% Air while thesecond group received dexmetomedin 7-10 mg/kg/h plus remifentanyl 6-9mg/kg/h. allthe following variables were recorded :blood pressure ,heart rate and O2 sat at induction,intubation, during abdomen CO2 insufflation ,at extubation and immediately at thearrival to the recovery room .time from cessation of the anesthetics agent for both groupstill extubation was measured, analgesic requirements during recovery stay were recordedaccording to visual analog score .

Results: Total intravenous anesthesia using remifentanyl and precedex in group II provided betterheamodynamic stability indicated by average (105.9) blood pressure and average (80.5)heart rate, while for the inhalational anesthesia the average blood pressure and heart ratewere (128.03), (99.3) respectively. And better analgesic effect (21.05%) of the patientsneeded analgesia in group 2 vs. (47.8%) in the group 1, while longer awakening timefrom anesthesia needed for group 2 (5.8min) which vs. group 1(3.5min) .

Conclusion: Total intravenous anesthesia using remifentanyl and dexmetomedin is an ideal method toanesthetize a morbidly obese patient, as it provides heamodynamic stability and betteranalgesics effect.

INTRODUCTION:

Morbid obesity is becoming a universal health and economical problem due to the

increasing number of the morbidly obese patient even in the developing countries,

undoubtfuly this dilemma makes a burden on the governments, patients and physicians1..

It is estimated that Ten percent of morbidly obese patients have severe respiratory

impairment such as obesity hypoventilation syndrome, while over 50% have moderate or

severe sleep apnea 2. Opioids can be associated with potentially pronounced respiratory

depressant effects in 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.

Laparoscopic surgery for morbidly obese patient is being carried out everyday under

general anesthesia and no doubt that the traditional anesthesia with inhalational

anesthesia for those patients carries many risks because smooth induction and attenuation

the stress response to endotracheal intubation and abdomen gas insufflation and during

the period of extubation and weaning of the ventilator is the main goal in anesthesia

generally and in such patient specially, and this is difficult to achieve with the

traditional inhalational anesthesia unless a large dose of opiod is used and this will make

them under risk of developing postoperative respiratory depression which is common for

those patients 2.other goal is a smooth recovery from anesthesia without letting them to

feel any pain or at least little pain and this again difficult to achieve with inhalational

anesthesia for the mentioned reasons.

Dexmetomidine is a sedative 2 agonist drug introduced to the market after approved by

the F.D.A in 1999 it has some desirable effects like decreasing the heart rate and

moderate hypotension and rapid onset of action and rapid elimination .it is now well
known that it has a good analgesic properties. 3. Recently precedex has been approved by

the F.D.A to be used for morbidly obese patients.

Remifentanyl which is an opiod agonist with a hypotensive effect and short duration of

action and analgesia and it has been used wildly for that properties.4

Our idea of using both drugs came from our search for drugs that have rapid onset and

offset of action ,hypotensive effect ,and that reduce the heart rate, in order to attenuate the

stress response which is exaggerated in the over weight patient.

METHOD:

Approval of Hospital Human Ethics Committee was procured and an informed patient

written consent was signed for each patient.

Fifty morbidly obese ,A.S.A class I, middle aged patients were randomly selected and

distributed into two groups, both groups received 5mg of dormicuim intramuscularly and

5mg of morphine intravenously as premedication one hour before the planned operation.

Large bore i.v canulla”g18” was inserted to all patients, in the operation room patients

laid on the operation table in a supine position. The following monitors were applied:-

Spo2 , E.C.G, N.I.B.P cuff and B.I.S to keep depth of anesthesia between 40-60 .

Anesthesia was induced for the two groups with fentanyl 1µg /kg, propofol 1-2 mg/kg,

rocuronium 0.9mg/kg for rapid intubation, after40 seconds intubation attempted using an

endotracheal tube size 8 mm and i.p.p.v with the following setting T.V of 4-6 ml/kg, R.R

of 10 was started, and peep of 5 also was added to reduce the risk of atelactasis post

operatively.

Anesthesia in the first group was maintained with sevoflurane 1.5 V% in addition to O2

70% in Air30%.

The second group received infusion of precedex 5-7 µg /kg/hr and remifentanyl 6-9 µg

/kg/hr in addition to O2 70%in Air 30%.
at the end of the surgery paracitamole 1g i.v and lornoxicam 16 mg i.v both over 10 min

were given to all patients in both groups .all anesthetics were stopped at the end of the

surgery and atropine 20 µg /kg with neostigmine 35 µg/kg were given in one syringe

to reverse the muscle relaxant. Patient were awakened up and transferred to the recovery

room. All patients received 2000 ml of lactated ringer to eliminate the effect of

hypovolemia on the heamodynamic stability.

All the surgeries were carried out by the same surgeon and the same anesthetist.

MEASUREMENTS:

All the following parameters were recorded B.P, SPO2, and HR at induction, intubation,

during CO2 isufflation of the abdomen, extubation and in the recovery room immediately

upon arrival .the time from cessation of the anesthetic agents till extubation was

measured, analgesic requirement in the recovery room were assessed according to visual

analog score from 0-10, where 0 means no pain till 10 which is the worst pain .

T test was used to analyze the data and p value less than 0.05 was significant. And Chi-

Square Statistics Section

RESULTS

All the patients successfully recovered from the surgery and so the analysis could be

carried out on the numbers of patients originally allocated. Table 1. Shows a summary of

the quantitative assessment made on these patients during their operations.

Two groups of morbidly obese patients were studied: table 1-1

Figure 1

Table 1-1: summary of the patients in both groups

	Group I	Group II
Patients number	25	25
Ages/year	35.2	35
Gender M-F	12-13	11 -14
B.M.I	41.8	43.7

All surgeries took an average time of (60_+ 10 minutes).

At intubation significant difference in the vitals signs was observed in the first

group were the mean deviation for the blood pressure was (115.5) and for the

heart rate it was (104.2) while minimal change was observed in the H.R and blood

pressure in the second group were the mean deviation from the induction values

for the blood pressure was (103.8) and for the heart rate it was (82.4).

During CO2 abdominal insufflations again in the first group there was big

deference in the vitals signs from the induction values were the mean deviation

for the blood pressure was (128) and for the heart rate it was (108.4) while

minimal change from the induction values was seen in the heart rate and blood

pressure in the second group were the mean deviation for the blood pressure was

(98.6) and for the heart rate was (85.6).

At extubation in the first group significant change was observed in blood pressure and the

heart rate were the mean deviation for the heart rate was (81.4) and for the blood pressure

it was (112.8).while in the second group the vital signs remained stable were the mean

deviation for the blood pressure was (145.9) and for the heart rate it was (109.9).

In the recovery room the patient in the first group still have a high blood pressure

and heart rate compared with the induction values were the mean deviation for the

blood pressure was (122.7) and for the heart rate (74.6), while the second group

could keep there blood pressure and heart rate within the induction values were

the mean deviation for the blood pressure was (108.4) and for the heart rate it was (72.5).

Regarding the time from discontinuing the anesthetic agent till extubation .it was shorter

in the inhalational anesthesia group (3.5minutes), while in the T.I.V.A group was (5.8

minutes).

No significant difference between the two groups was seen regarding the O2 saturation

all through the operation were the mean deviation in the first group at intubation was

(100),during CO2 insufflation was(99.4) and at extubation was(98.5) and in the

recovery room it was (98.1).

While in the second group the mean deviation at intubation was (99.9), and during co2

insuflation was (99.8),and at extubation it was(99.5)and in the recovery room it was (

99.3) .

There was significant deference in the pain score registered immediately in the recovery

room and consequently the analgesic requirements of the patient where fewer patients in

the second group asked for analgesic drugs (21.05%) While in the first group more

patients asked for analgesics (47.8%).

DISCUSSION:

Anesthesia for morbidly obese patients is a challenge to every anesthetist 5-7, our idea

for this study came from our search for an anesthetic method that combines rapid onset

and short duration of action with some residual analgesia to use it in this type pf surgery

which is laparoscopic surgery for morbid obesity, from the statistics shown above,

During period of intubation which is very stressful in such group of patient, because the

incidence of difficult intubation and multiple attempts for intubation is common 8-11,

inhalational anesthesia did not provide cardiovascular stability like the intravenous

anesthesia and this can be attributed to the hypotensive effect of remifentanyl and dex,

and there effect in reducing the blood pressure and the heart rate.

During the period of CO2 abdominal insufflation which is characterized by an increase in

the heart rate and blood pressure which is due to maybe some absorbed CO2 in the

circulation and its effect on stimulation of the sympathetic system ,and due to the effect

of positioning of the patient during band placement 13.inhalational anesthesia didn't

provide cardiovascular stability to the inhalational group At extubation; were many

effort has been made in the history of anesthesia to pass this period smoothly the

advantages of total i.v anesthesia were great, we could extubate the patients very

smoothly regarding there vital signs and there consciousness the patients could open there

eyes and respond to the commands were the endotracheal tube still in place without

coughing which was like magic in anesthesia as we believe, and this is even can be

applied in other fields of anesthesia as we think. Some patients even were able to move

there heavy bodies from the operating table to there bed.

In the recovery room the effect of T.I.VA .with precedex and ultiva on hemodynamic

stability continues to prove to be very efficient, were the patients still have more stable

heart rat and blood pressure in the second group and this because the residual effect of

dexmetomedine on hemodynamic stability and its residual analgesic effect as shown

below.

most of the patients after surgery and during the recovery stay recorded low pain scores

measured by visual analog score and this indicated by there analgesic requirement for the

both groups and this is attributed to the residual analgesic effect of Dexmetomidine

mainly because the same analgesia were given to all patients

.in a study done by rger E.

Hofer, MD*, Juraj Sprung, MD PhD*, Michael G. Sarr, MD and Denise J. Wedel,

MD)12 precedex proved to have opiod sparing effect in morbidly obese patient

Finally, it is worthy to mention that spite of all the benefits of total intra venous

anesthesia used her we had one case of awareness in the second group even B.I.S score

were kept between 50 and 60 the patient could recall all the intra operative events .

In conclusion: total intravenous anesthesia using dexmetomidine and remifentanil is a

good method to anesthetize morbidly obese patients since it provides great

heamodynamic stability all through the operation and good residual analgesic effect.

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