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Research Article

DAY CARE SURGERY: COMPARISON OF TWO ANAESTHETIC TECHNIQUES IN OBESE PATIENTS

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ABSTRACT
Obese patients offer a major patient load on hospital setups. Extra stay in hospitals increases morbidity. It also increases financial load to the third party payers. In our study, we compared two techniques for the short procedures less than 30 minutes. A randomised double blind study was done amongst 60 patients, with obesity grade 1 [BMI up to 35Kgm^2], scheduled for day care surgery. We conducted surgeries less than 30 minutes, in our institute in 2 years, SRMSIMS, Bareilly. Both group received same techniques for induction inj. Midazolam 1mg, Fentanyl 2mcg/kg, Propofol 2mg/kg, Group P was maintained with Propofol 75-150mcg/kg/minute and second group S was maintained with variable concentration of Sevoflurane 1-4%. Patients of both groups received Oxygen 33% and Nitrous Oxide 67%in spontaneously breathing patients, with LMA in situ. Monitoring was done with BIS, NIBP, ECG, RR and HR. Changes in vital parameters were noted. Time for eye opening, obeying commands, Time to sit up and stand up were noted. Recovery following Modified Aldrete System was noted. 60 patients enrolled in our study, their datas were recorded and analysed according to SPSS analysis. Intraoperative hemodynamic stability was more in group S. Recovery profiles in both groups were almost similar. Group P developed less PONV than group S.

Keywords: *Obesity, Ambulatory Surgery, Anaesthesia Techniques, Modified Aldrete Scoring System*

INTRODUCTION
Food habits and sedentary life styles have created a pandemic of obesity. According to World health statistics 2012, one in six adults is obese (World health statistics, 2012)**.** Every hospital is facing a major obese patient load. According to American society of anaesthesiologists (ASA) class 1 and 2 patients are to be considered for ambulatory care including uncomplicated obese patients (Gangadhar *et al.*, 2012; Verma *et al.*, 2011; Reader, 2010). BMI is the most commonly used index to measure obesity. It is ratio between weights in kg divided by square of the height in meters [kg/m^2]. Classification is as follows-25-30-overweight, 30-35-obese class 1, 36-40-obese class 2, more than 40-morbid obese (SWAPNET, 2013). Ambulatory surgery offers a number of advantages for patients, health care providers, third party payers and even hospitals, creating a win-win situation. Patients' separation from their homes and family environment and loss of man hours is reduced. Unlike inpatient surgery, ambulatory surgery does not depend upon the availability of a hospital bed. The cost is 75% lower than for in patient.
The aim of our study is to compare two anaesthesia techniques for obese patients in day care surgery.

MATERIALS AND METHODS
After approval by the institutional ethical committee and informed consent by the patient, ASA grade 1 and 2 patients, aged 20-45 years undergoing short operative procedures lasting less than 30 minutes; D and C, Cystoscopy, Implant Removal etc. were taken up in the study. Patient's queries regarding anesthesia and surgery were sought. A thorough history and systemic examination of each patient was performed. Patients were investigated routinely for. CBC, S. Creatinine, electrolytes, urea, Urine R/M, ECG, CXR, BT and CT.
We excluded ASA grade III or IV patients, alcohol/drug abuse, H/O allergic reactions to any of the drugs being used, motion sickness, PONV, use of antiemetic drugs in last 24 hours of surgery, Patient <18 years and >65 years, emetogenic surgeries, H/O OSA, patients not having any responsible adult at their homes.
60 Patients, 30 in each group were taken for this study. All patients received oxygen via face mask for 5

minutes preoperatively before induction of anaesthesia. Standard monitors SPO2, NIBP, ECG and Respiratory rate were attached. All patients received 500 ml Ringer Lactate iv before surgery. Every patient received inj. Ranitidine 50 mg and inj. Ondansetron 4 mg i.v. inj Midazolam 1 mg i.v. and inj Fentanyl 2 mcg/kg i.v, 3 minutes prior to induction. In P group anaesthesia was induced with Propofol 2mg/kg of ideal body weight. Appropriate size LMA was placed. After induction BIS was attached, target BIS was 40-60. Continuous capnography was used during the procedure. Maintenance was with Oxygen 33% and Nitrous Oxide 67% in spontaneously breathing patients through closed circuit. Propofol infusion was also used at the rate of 50-150 mcg/ kg /minute. Group S- Induction was done with Propofol 2mg/kg of ideal body weight. Maintenance was done with Oxygen 33%, Nitrous Oxide 67% and Sevoflurane 1-4% variable rate in spontaneously breathing patients. After the surgery, in P group, Propofol infusion was stopped and in S group Sevoflurane was stopped. After 3 minutes, Nitrous Oxide was stopped. Absence of purposeful movements and tachypnea [RR more than 20] was considered as optimal intraoperative analgesia. LMA was removed after eye opening and mouth opening to command. After removal of LMA, face mask was placed. Total anaesthesia time was considered from induction to discontinuation of anaesthetics. Total surgical time from incision to placement of dressing was noted. Patients were shifted to recovery room in head up tilt 30º, when recovery score was more than 8 .On awakening from anesthesia, patients were revaluated at 1 minute intervals with respect to their ability to meet specific (fast track) discharge criteria. Recording of following at 5 minutes interval was done.-MAP, HR, SPO_2, RR. Recovery was also assessed at 10 minutes interval using Modified Aldrete Score [MASS] (White and Song). Early Recovery Phase I commenced on discontinuation of the anesthetic agent, which allows the patient to awaken, recover protective airway reflexes and resume motor activity. Phase II recovery occurs when patients have minimal pain, no vomiting and are able to tolerate oral fluids, to void, to sit, to walk and are ready for discharge from PACU. Phase III recovery occurs after discharge and continues till patient resumes daily activities. All patients required to be accompanied home with a responsible adult and who could stay with him for a minimum of 24 hours post discharge. Each patient was provided with a contact number where he remains in touch with a health care provider in case of any difficulty. Side effects e.g. vomiting and pain were recorded. All patients received verbal and written instructions. Advices were given not to drink alcohol, operate machinery or drive for 24 hours after. All patients were discharged with a supply of non sedating oral analgesics and antiemetics The severity of emesis was assessed, based on a 4-point scale suggested by Belville *et al.*, to determine the emesis score in the following manner (Belville *et al.*, 1960). O- No nausea or vomiting, 1- Nausea alone, 2- Vomiting once, 3- Vomiting > 3 times. Pain was assessed using a 10 cm Visual Analog pain Scale (VAS) where in scoring of pain from 0 to 10 was done with markings, corresponding to 0-no pain, 10 worst imaginable pain and with 1 to 3 implying mild pain 4 to 6 implying, moderate pain and 7 to 9 implying severe pain. Postoperative pain was treated with injection Paracetamol 1gm infusion.

RESULTS AND DISCUSSION

Data was managed in an excel spreadsheet. Quantitative values were assessed for approximately normal distribution. Each of those variables was summarized by mean and standard deviation. For comparing the two main groups Paired t test was applied. SPSS statistical software was used for data analysis. In this study p value less than 0.05($p<0.05$) have been considered as statistically significant.

Demographic Data

	GROUP P	GROUP S	P VALUE
AGE[in years]	44.6±17.12	42.4±15.16	0.050
HEIGHT[in cm]	166±2.82	162±5.65	0.626
WEIGHT[in kg]	93±4.24	89.5±3.53	0.639
BMI[kg/m]	33.75±0.353	34.15±1.060	0.570

Duration of Anaesthesia and Surgical Time

Groups	Group P	Group S	P value
Mean Anaesthesia time [in minutes]	20.25±6.39	22.02±5.44	0.472
Mean Surgical time [in minutes]	18.27±6.35	18.62±6.39	1.00

Mean surgical time and mean anaesthesia time were compared, as p value is not significant Heart rate changes in both groups were comparable. Hypotension was defined as fall in blood pressure of more than 20% of the base line. In our study, induction of anesthesia with Propofol produced a fall in B.P. initially in one case without significant change in the heart rate. Mostly patients were of young age group of [18-55 yrs], ASA I-II group. We did short procedures of < 30 minutes duration without major fluid shifts, so we considered pre operative fasting [sometimes up to 12 hours] the main cause for this fall in BP. Subsequently we started pre loading of every patient with Ringer lactate 500ml before induction. Only one patient showed drop in blood pressure in group la, which was improved with injection Mephenteramine. 6 mg and Ringer Lactate 500 ml. There was no statistically significant difference in oxygen saturation between these two subgroups at any stage during the study p> 0.05. The preoperative oxygen saturation of all groups were comparable and these was no statistically significant difference between them, P value > 0.05. Although mostly patients in Propofol infusion, group had apnea transiently, which was corrected by controlled ventilation through LMA.

Data Related To Recovery

	Group P	Group S	P value
Eye opening time	6.54±0.56	7.36±0.66	0.093
Response to commands	8.50±1.18	8.58±0.46	0.827
Time to sit up	18.10±0.496	18.53±0.922	0.255
Time to stand up	40.75±1.70	47.0±4.69	0.043
Recovery foll. MASS	63±15.05	55.25±4.78	0.478

Data Related To PONV

	Group P	Group S	P value
Nausea	2	6	0.000
Vomitting	2	4	0.500

Recovery profile in both groups was similar. Although recovery in groups P and S were 63±15.05 and 55.25±4.78 minutes respectively, but we kept patients for 6 hours in recovery area. In group P, 2 patients had nausea, of which 2 had vomiting. In group S 6 patients had nausea, of which 4 had vomiting. It was treated with inj. Ondansetron 4 mg intravenously. Postoperative pain was corrected with inj. Paracetamol 1 gm intravenously.

DISCUSSION

In India, ambulatory anesthesia is not new; it is being practiced for last 40 years. Dr S.B. Gangadhar defined that BMI up to 40 kg/m^2 are suitable for day surgery, although the incidence of complications during perioperative period increases with increasing BMI. These problems occur in the first 3-4 hour postoperative period, which can be easily resolved and patient can be discharged. The day surgery with its short duration anaesthetics and early mobilization are especially suitable for obese patients (Gangadhar *et al.,* 2012). We took patients having BMI up to 35 and we selected surgery up to duration of less than 30 minutes. We excluded patients with OSA, according to Dr. G.P. Joshi, these patients are at a high risk of perioperative complications, that may last for several days after surgery (Joshi, 2013). Pavlin *et al.*, reported that GA with newer anesthetic drugs allowed an earlier discharge as compared with spinal or epidural anesthesia in newer practice [184 vs. 202 min for males] and [185 vs. 213 min for females] (Pavlin, 1998)**.** So we chose general anaesthesia instead of regional anaesthesia. The introduction of rapid

ultra short acting anesthetic agents like Propofol, Isoflurane and Sevoflurane and Fentanyl achieve a recovery profile that facilitates fact tracking after GA. Concepts of comparing maintenance by TIVA and inhalational anaesthetics is not new. Dr. Neerja Bharti in a similar study, compared induction with Propofol group 2-3 mg/kg and maintained with Propofol infusion50-200mcg/hr. and Sevoflurane group induction with 5-8% and maintenence with Sevoflurane 4%.Their result suggested that rapid recovery can be achieved with both the techniques. Sevoflurane provided better intra operative hemodynamic stability than Propofol during surgery (Bharti *et al.,* 2012).

As Propofol does not have any analgesic property, so we have used Propofol and Fentanyl combination in low doses for balanced anesthesia (Bajwa and Bajwa, 2010)**.** Fentanyl does not unduly delay recovery and provides early postoperative analgesia. It can also be used as rescue pain medication in the initial recovery phase, providing analgesia long enough to allow non Opioid analgesics with a slower onset to exert their effect. Ghabash M used Fentanyl to depress excitatory effects of Propofol,t o provide CVS stability, deepen the plane of anaesthesia and decrease the awareness (Ghabash *et al.,* 1990).

The obese patients present specific challenges to both surgeons and anaesthesiologists. The adverse events are as likely to occur in an inpatient setting as in day care setting (Anderson, 2008). Although an increased risk of adverse events intraoperatively and in the immediate recovery period in obese patients have been reported, these have not been shown to significantly increase unplanned admissions (Duncan *et al.,* 1992)**.** We used Bi Spectral Index in our study. According to O. Ibraheim BIS allows reduction in the total amount of anaesthetic that patients are exposed to and appears to decrease time for emergence and recovery (Ibrahhim, 2007; Song *et al.,* 1997; Gan *et al.,* 1991).

Avoidance of hospital admissions by choosing ambulatory surgery resulted in improved patient satisfaction and significant cost savings without compromising patient care. In our study although patients achieved MASS recovery score in group P 63±15.05 minutes and group S 55.25±4.78 minutes respectively. But we kept patients in the PACU for 6 hours. According to Motsch *et al.,* in urological and ophthalmic day surgeries, early recovery and the return of psychomotor and mental function in the first 60 min after anaesthesia is faster following Sevoflurane than after Propofol (Motsch *et al.,* 1996). Raeder *et al.,* reported greater incidence of PONV with, Sevoflurane maintained patients as compared with Propofol maintained patients (Raeder *et al.,* 1997). Tramer told that Propofol is not the sole antiemetic, if used as an induction agent alone, because it has short duration of action (Tramer *et al.,* 1997). In our study incidence of PONV is still less in group P.

So we used Propofol for induction in both the groups and for maintenance in one group, as it has favorable pharmacokinetic, Pharmacodynamic and antiemetic properties as we have discussed earlier for day care surgery.

Conclusion

Ambulatory surgery for obese patients is an upcoming field now. Methods are being developed to improve early recovery and complication free anaesthesia. This is also developed to decerase patient load in hospitals. In our study group S was having more stable haemodynamics. Recovery profile in both groups are almost similar, but group P had less PONV.

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