



COMPARISON OF DEXMEDITOMIDINE AND PROPOFOL FOR HEMODYNAMIC AND RECOVERY CHARACTERISTICS IN DILATATION AND CURETTAGE.

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INTRODUCTION

Minor surgical procedures are usually performed as day care procedures in order to save the hospital resources. The most common minor surgery in obstetrics and gynecology is Dilatation and curettage (D & C).¹ Propofol is considered an ideal agent for day care surgeries because of rapid onset and recovery.² The combination of sedative and analgesic is frequently used for minor surgical procedure. Propofol and opioid is the most frequently used combination for D&C. Although propofol has the advantage of rapid recovery from anaesthesia but as it has no analgesic property so its combination with opioids can lead to respiratory depression.³

Dexmedetomidine is an alpha-2 agonist which provides analgesia, sedation and cardiovascular stability without any respiratory depression.^{4,5} It provides conscious sedation which leads to early recovery from anaesthesia. Dexmedetomidine

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ABSTRACT... Objectives: To evaluate the hemodynamic and recovery characteristics of dexmedetomidine and propofol in dilatation and curettage. **Study Design:** Randomized control trial. **Setting:** Department of Anaesthesia, DHQ Teaching Hospital Sargodha. **Period:** March 2016 to December 2017. **Material & Methods:** Patients undergoing dilatation & curettage were randomly divided into two groups, group P received IV propofol 1.5mg/kg slowly over 5 min and group D received dexmedetomidine at a loading dose of 1µg/kg followed by 0.5 µg/kg/h. During the procedure blood pressure and heart rate were compared in both groups. In the recovery room, recovery time was compared in both groups by using modified aldrete score. **Results:** In Group D, the decrease in heart rate was statistically significant when compared with group P. Both groups showed a decrease in MAP but results were not statistically significant when compared in both groups. Patients in group D were discharged earlier from recovery room than group P and results were statistically significant. **Conclusion:** Dexmedetomidine provides better recovery than propofol so it is a suitable drug for day care minor surgical procedures. Similarly dexmedetomidine is superior to propofol by providing less respiratory depression intraoperatively.

Key words: Dexmedetomidine, Dilatation and Curettage, Propofol.

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also potentiates the analgesic effect of opioids so combination of dexmedetomidine with opioids such as nalbuphine seems to be a better option for minor gynecological procedures.⁶ This combination can also lead to early discharge from post anaesthesia recovery unit.⁷ There is inadequate data available for use of dexmedetomidine in D & C.

The main aim of this research was to compare the intraoperative hemodynamic changes, respiratory effects and the recovery profile of dexmedetomidine with propofol in patients undergoing D & C.

MATERIAL & METHODS

After taking written consent from hospital ethical committee and patients, 50 patients fulfilling the inclusion criteria were enrolled in the study. Preoperative anaesthesia assessment was done. Baseline vitals such as heart rate, systolic

blood pressure, diastolic blood pressure, mean arterial blood pressure and oxygen saturation were recorded. Intravenous line was taken in preoperative room and infusion of ringer lactate started. Standard ASA monitors were applied to all patients. Patients were randomly divided into two groups, Group P received propofol and Group D received dexmedetomidine. Patients in both groups were given injection nalbuphine 0.1 mg /kg and injection midazolam 2mg intravenous prior to start of procedure. Oxygen was given to patients of both groups through nasal cannula at the rate of 3 liter/ min. Patients in group P were given propofol 1.5 mg / kg slow intravenous bolus over 5 min. Patients in group D were given dexmedetomidine at loading dose of 1 μ g/ Kg intravenous over 5 min followed by 0.5 μ g/ kg/ hr infusion till Ramsay sedation score 3-4 achieved. Propofol was given intravenous in incremental boluses of 10 mg in case patient was uncomfortable. During procedure heart rate and mean arterial blood pressure (MAP) were recorded at 0 min, 2 min, 4 min, 10 min and 15 min and post operatively in recovery room .Decrease in Oxygen saturation less than 90 % were also noted in both groups and treated accordingly. After completion of procedure, all patients were shifted to anaesthesia recovery area. Postanaesthesia recovery was assessed by modified Aldrete scoring system every 5 minutes. All patients were discharged from recovery unit after achieving modified Aldrete score of 10. The duration of stay

of every patient in post anaesthesia recovery unit was noted and compared in both groups.

RESULTS

SPSS version 20 was used to analyse the data. Data was expressed as mean and standard deviation for quantitative variables and number and percentages for categorical variables. Chi square test was used to compare the two groups. P < 0.05 was considered significant. Demographic data such as age, weight and duration of surgery were comparable in both groups (Table-I). Baseline vitals such as Heart rate (HR) and mean arterial blood pressure (MAP) were also comparable in both groups (Table-II & III). Regarding Heart rate there was a significant decrease in heart rate in group D throughout the procedure as compared to group P (Table-II). Similarly there was a fall in MAP throughout the procedure in both groups. But when MAP was compared in both groups results were not statistically significant (Table-III). 12 out of 25 patients in group P and 4 out of 25 patients in group D showed respiratory depression which was evident by decrease in oxygen saturation less than 90%. The recovery was much faster in group D as compared to group P. The mean duration of stay in postanaesthesia recovery unit in group D was 66+4 and 80+2 minutes in group P and the difference between two groups was considered significant (Table-IV).

Variable	Group P(n=25) mean \pm SD	Group D (n=25) mean \pm SD	P-Value
Age (year)	27.29 \pm 5.39	28.71 \pm 4.12	0.2964
Weight (kg)	67.31 \pm 7.27	68.49 \pm 8.37	0.5971
Duration(min)	12.21 \pm 4.27	14.31 \pm 2.79	0.0459

Table-I. Demographic data

Time	Group P(n=25) mean \pm SD	Group D(n=25) mean \pm SD	P-Value
0 Mins	85.92 \pm 11.20	84.57 \pm 10.64	0.6642
2 Mins	83.27 \pm 9.31	73.58 \pm 8.29	0.0003
5 Mins	87.31 \pm 8.43	70.29 \pm 10.10	<0.0001
10 Mins	84.63 \pm 8.31	69.21 \pm 7.29	<0.0001
15 Mins	85.71 \pm 10.21	72.81 \pm 9.21	<0.0001
Post Operation	82.37 \pm 8.47	73.92 \pm 11.21	0.0043

Table-II. Perioperative heart rate

Time (Mins)	Group P(n=25) mean±SD	Group D(n=25) mean±SD	P-Value
0 Mins	88.22 ±8.92	86.31 ±9.21	0.4601
2 Mins	84.31 ±9.21	85.32 ±8.28	0.6853
5Mins	83.21 ±8.14	81.32 ±9.27	0.4475
10 Mins	79.31±10.21	80.21±11.21	0.7679
15 Mins	78.47 ± 9.31	80.47 ± 8.22	0.4248
Post Operation	81.37±11.31	82.31±10.30	0.76

Table-III. Perioperative mean arterial blood pressure (MAP)

DISCUSSION

Propofol is the most common agent used for induction of anaesthesia due to its favourable pharmacokinetics. It has rapid onset and short duration of action⁸ It is also used as sedative for short duration procedures and for patients on mechanical ventilation. As propofol has no analgesic property so it is usually used in combination with opioids such as fentanyl, nalbuphine etc in minor surgical procedures. The common adverse effects of propofol are hypotension and respiratory depression.^{9,10} Dexmedetomidine is a newer drug in Pakistani market which has both sedative and analgesic properties.¹¹ It is an excellent drug used for sedation in mechanically ventilated patients. The main advantage of dexmedetomidine over propofol is that it does not cause respiratory depression and hypotension. Keeping in view of these advantages we compared the hemodynamic and recovery profile of dexmedetomidine with propofol in patients undergoing dilatation and curettage. The most common minor obstetric procedure is dilatation and curettage which is usually done as day care procedure. Tomat GS Singh et al in his study showed that although dexmedetomidine is good alternate to propofol but it is not suitable as sole sedative and analgesic agent in minor surgical procedures.¹² They suggested that dexmedetomidate should be combined with opioids by using its opioid sparing property. In our study we used nalbuphine IV 0.1 mg / kg in both groups and also injection midazolam 2mg IV was given to patients of both groups. Similarly oxygen was given to patients of both groups at the rate of 2 liter per minute through nasal cannula.

There was a decrease in heart rate in both groups but in group D decrease in heart rate was more

than group P. The more pronounced decrease in heart rate might be due to the sympatholytic property of dexmedetomidine. The results of our study regarding heart rate were consistent with the study of Shipra Singh in which author compared the hemodynamic characteristics of dexmedetomidine plus nalbuphine vs propofol plus fentanyl in minimally invasive gynaecological procedures.¹³ In our study there was a decrease in mean arterial blood pressure (MAP) in both groups but when both groups were compared regarding MAP, results were insignificant. On the other hand Sethi P et al. in their study found statistically significant decrease in blood pressure in propofol group when compared with dexmedetomidine group.¹⁴

P. Taniyama et al in their study showed there was no significant difference in respiratory depression between intravenous sedation with dexmedetomidine and propofol in minor oral procedures.¹⁵ But in our study the interesting finding was that the dexmedetomidine group maintained an adequate respiratory function as compared with propofol.

12 patients in group P showed significant decrease in oxygen saturation (Spo₂ <90%) while 4 patients in group D show desaturation which was treated by increasing the flow of oxygen and head tilt chin lift maneuver.

In our study patients in dexmedetomidine group achieved discharge criteria early as compared to patients in propofol group. Modified Aldrete score was used for discharge of patients from recovery unit. Ghali, Ashraf et al. showed in their study that time to achieve an Aldrete score of 10 was similar in dexmedetomidine versus propofol

for sedation in patients undergoing vitreoretinal surgery under sub-Tenon's anesthesia.¹⁶ On the other hand, Shah, Pratibha Jain et al. showed that the onset and recovery from propofol sedation were significantly earlier as compared to dexmedetomidine (15.57 ± 1.89 min vs. 27.06 ± 2.26 min; $P < 0.001$).¹⁷

CONCLUSION


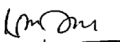



Dexmedetomidine is an excellent drug for day care minor surgical procedures. It produce conscious sedation and analgesia with minimal respiratory depression. It is a good alternate to propofol in short duration surgical procedures. Dexmedetomidine produce opioid sparing effects due to its analgesic properties. The recovery characteristics of dexmedetomidine is better than propofol.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Raza Farrukh	Concept and design of study.	
2	Waseem Sadiq Awan	Data analysis & revisiting critically.	
3	Ahmed Hassan Khan	Paper writing & data analysis.	
4	Asaad Rizwan Rana	Data analysis & revisiting critically.	
5	Ahmed Aziz Jilani	Data analysis.	
6	Khalid Mahmood	Data analysis.	