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

Raza Farrukh¹, Waseem Sadiq Awan², Ahmed Hassan Khan³, Asaad Rizwan Rana⁴, Ahmed Aziz Jilani⁵, Khalid Mahmood⁶

ABSTRACT... Objectives: To evaluate the hemodynamic and recovery characteristics of dexmeditomidine 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 dexmeditomidine 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: Dexmeditomodine provides better recovery than propofol so it is a suitable drug for day care minor surgical procedures. Similarly dexmeditomidine is superior to propofol by providing less respiratory depression intraoperatively.

Key words: Dexmeditomidine, Dilatation and Curettage, Propofol.

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.⁴⁵ It provides conscious sedation which leads to early recovery from anaesthesia. Dexmedetomidine 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 dexmeditomidine. 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 dexmeditomidine at loading dose of 1µg/ Kg intravenous over 5 min followed by 0.5 µg/ 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+4and 80+2 minutes in group P and the difference between two groups was considered significant (Table-IV).

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

Table-I. Demographic data

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

Table-II. Perioperative heart rate
**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 action. 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. Dexmeditomidine is a newer drug in Pakistani market which has both sedative and analgesic properties. It is an excellent drug used for sedation in mechanical ventilated patients. The main advantage of dexmeditomidine 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 dexmeditomodine with propofol in patients undergoing dilatation and curretage. The most common minor obstetrics procedure is dilatation and curretage 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. 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 sympatholytic property of dexmeditomidine. The results of our study regarding heart rate were in consistent with the study of Shipra singh in which author compared the hemodynamic characteristics of dexmeditomidine plus nalbuphine vs propofol plus fentanyl in minimally invasive gynaecological procedures. 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 dexmeditomidine group.

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. 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.\textsuperscript{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 dexmeditomidine (15.57 ± 1.89 min vs. 27.06 ± 2.26 min; P < 0.001.\textsuperscript{17}

**CONCLUSION**

Dexmeditomidine 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. Dexmeditomidine produce opioid sparing effects due to its analgesic properties. The recovery characteristics of dexmeditomidine 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.                                          |                     |