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Original Research Article

COMPARATIVE STUDY OF DEXMEDETOMIDINE AND PROPOFOL FOR MONITORED ANAESTHESIA CARE IN PATIENTS UNDERGOING CATARACT SURGERY

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ABSTRACT

Background: The present study is undertaken to perform a comparison and evaluation of efficacy of dexmedetomidine and propofol as an appropriate sedative drug for Monitered Anaesthesia Care (MAC) in patients undergoing cataract surgery under day care basis in Bhaskar General hospital.

Material and Methods: A total of 60 patients between the age group of 20-75 years were included in the study. They were ASA I, II or III and scheduled for the cataract surgery under MAC. After obtaining approval from the ethical committee and obtaining informed consent, patients were randomly divided into two groups, as group D(n=30) and group P(n=30) to receive dexmedetomidine and propofol respectively. Patients fasted at least 8 hours before operation and did not receive any pre-operative sedative drug. Topical anaesthesia using the sterile 0.5% proparacaine hydrochloride ophthalmic solution was applied to the eye of the patients to be operated. Group D consisted of 30 members with equal male and female distribution. These patients received Dexmeditomidine infusion of 0.6mcg/kg/hr and titrated every 5 minutes to maintain Ramsay sedation scale 3 during the operation and the drug was adjusted by the 0.1mcg/kg/hr. Group P consists of 30 members, with equal male and female distribution. These patients received propofol infusion of 2mg/kg/hr and titrated every 5 minutes to maintain Ramsay sedation scale 3 during the operation and the drug was adjusted by 0.3mg/kg/hr. The infusion was stopped at the end of the surgery in both groups. In the postoperative ward, patients were asked to answer the 11 questions of Iowa satisfaction with anaesthesia scale (ISAS) using a 6-point rating scale at least 1 hour after the operation. It was performed by one anaesthesiologist who was blinded to the group assignment.

Results: In the present study, MAP, HR, respiratory rate (RR), and peripheral oxygen saturation (SpO2) were recorded at each time point as follows; T1 = preoperative baseline, T2 = anaesthesia start, T3 and T4 = 5 and 10 min after anaesthesia, T5 = operation start, T6, T7, and T8 = 5, 10, and 15 min during operation, T9 = postoperative value. MAP, HR, RR, SPO2 were compared between the 2 groups, group D and P at various time points from T1-T9 were found not to be statistically significant as $p>0.05$. ISAS of group D is 53.50 ±2.193 and ISAS of group P is 43.10 ±2.090. The p value between the 2 study groups is 0.0001 which is highly statistically significant. Ramsay sedation scale of 3 was maintained throughout the operation in both the study groups.

Conclusion: The study showed that dexmedetomidine seems to be a appropriate sedative drug with better patient satisfaction scores for MAC compared to propofol in patients undergoing cataract surgery.

Keywords: Monitered Anaesthesia Care,Propofol, Dexmedetomidine,Iowa Satisfaction with Anaesthesia scale,Ramsay sedation score, Cataract.

INTRODUCTION

Cataract surgery can be safely performed under monitored anaesthesia care (MAC) with or without local anaesthesia.[1] Several drugs such as propofol, benzodiazepines and opioids have been used for MAC either alone or in combination.[2,3,4]

Benzodiazepines may cause excessive sedation and confusion especially in elderly patients, and propofol can also result in disorientation and excessive sedation.[5,6] Because these drugs have no analgesic component topical local anaesthestics were often used to prevent the unintentional reflex to painful stimuli during the surgery.

Considering that, most of the patients undergoing cataract surgery are elderly, the above mentioned aspects can be serious potential problems. Based on the analysis of the American Society of Anaesthesiologists Closed Claim database, over dosage of sedative leading to respiratory depression was the most common (24%) in MAC claims and 40% of these resulted in permanent brain damage or death.[7]

Dexmedetomidine is a novel selective α2 receptor agonist that produces sedation and analgesia without causing respiratory depression.[8] It also allows patients to respond to the verbal commands during sedation.[9] It has been used in various clinical fields such as sedation in ICU, awake intubation, shockwave lithotripsy, endoscopic examination and as an adjuvant to anaesthetics.[10]

The present study is undertaken to perform a controlled comparison and evaluation of efficacy of dexmedetomidine and propofol as an appropriate sedative drug for MAC in outpatients undergoing cataract surgery.

Aims & Objectives of the study

To compare and evaluate the efficacy of dexmedetomidine versus propofol as sedative drug for monitored anaesthesia care in patients undergoing cataract surgery.

MATERIAL AND METHODS

After obtaining approval from the ethical committee, informed consent for participation in the study was taken from all the patients.This trial was conducted in adult outpatients aged between 20 and 75 years with American Society of Anaesthesiologists (ASA) grade I, II or III and scheduled for cataract surgery under MAC uder day care basis in Bhaskar General Hospital.

Pre-operative exclusion criteria were pregnancy, kidney or hepatic disease, chronic medication with analgesic or sedative drug, or history of alcohol or drug abuse.

Randomisation was done using the website www.randomisation.com to divide the patients into two groups of 30 each, to receive either dexmedetomidine (group D n=30) or propofol (group P n=30) as sedative drug. Patients fasted at least 8 hours before the operation and did not receive any preoperative sedative drug. On arriving at the operating room, standard monitoring, including electrocardiography, non-invasive arterial blood pressure cuff, and peripheral pulse oximetry were applied. Oxygen was administered via nasal cannula at 5 L/min. Topical anaesthesia using sterile 0.5% proparacaine hydrochloride ophthalmic solution was applied to the operating eye of the patients.

Patients of group D received 0.6 mcg/kg/hr of dexmedetomidine, and patients of group P were given 2 mg/kg/hr of propofol infusion over a period of 15 minutes before surgery respectively. Dexmedetomidine was diluted in 2 mcg/ml in normal saline for group D, and 100 mg of propofol accounting to 10 ml volume for group P. Each drug was titrated every 5 min to Ramsay sedation scale 3 during the operation. Administration of dexmedetomidine was adjusted by 0.1mcg/kg/h, and propofol was adjusted by 0.3 mg/kg/h respectively. Injection Ephedrine 5 mg was kept ready to be administered in case systolic blood pressure decreased below 90 mmHg or 70% of the preoperative value. Injection Atropine 0.5 mg was kept ready to be administered in case heart rate (HR) decreased below 50 beats/min.

The infusion was stopped at the end of the surgery in both groups. In the recovery room, patients were asked to answer the 11 questions of Iowa satisfaction with anaesthesia scale (ISAS) using a 6-point rating scale,at least 1 hour after the operation. It was performed by one anaesthesiologist who was blinded to the group assignment.

MAP, HR, RR, and peripheral oxygen saturation (SpO2) were recorded at each time point as follows; T1 = preoperative baseline, T2 = anaesthesia start, T3 and T4 = 5 and 10 min after anaesthesia, T5 = operation start, T6, T7, and T8 = 5, 10, and 15 min after operation, T9=postoperative value. Moreover, the incidence of adverse events including hypertension, hypotension, bradycardia (HR< 50 beats/min), respiratory depression (RR<10 breaths/min), and oxygen desaturation (SpO2<93%) were evaluated.

Statistical Analysis

Data was entered in Microsoft excel and analysis was done using SPSS version 20.

Descriptive statistical analysis was done. Results on continuous measurements are presented as Mean & Standard Deviation. Results on categorical measurements are presented as percentages. Significance is assessed at 5 % level of significance.

Student t test (independent, two tailed) has been used to find out the significance of study parameters on a continuous scale between two groups.

Chi square test is used to find out the significance of study parameters on a categorical scale between two groups.

RESULTS

A total of 60 patients were recruited in this study. After initiation of the study, 30 patients were assigned to group D and the other 30 patients were assigned to group P. The characters of subdivided groups found no significant differences between the two groups. Total anaesthesia time was 36.0 ± 6.1 min in group D and 38.2 ± 7.3 min in group P, and operation time was 21.0 ± 5.6 min and 20.7 ± 5.1 min in group D and P, respectively. These were comparable between the two groups.

Postoperative ISAS was 53.5 ± 2.193 in group D and 43.10 ± 2.090 in group P with significant difference (P < 0.001), indicating more satisfactory condition with group D.

Changes of haemodynamic and respiratory variables are presented in the tables and graphs. MAPs were not different between the two groups, when MAP for group D (88.37 ± 12.931, 84.0 ± 12.575, 80.13 ± 12.079, 75.67 ± 11.198, 72.33 ± 9.151, 71.50 ± 6.585, 69.87 ± 5.788, 70.60 ± 5.430 and 70.27 ± 5.199) was compared with group P (83.23± 11.196, 79.23 ± 10.753, 76.33 ± 9.852, 73.57 ± 8.985, 72.00 ± 7.661, 70.37 ± 6.620, 68.63 ± 5.499, 67.87 ± 5.692 and 67.87 ± 5.692) throughout the procedure and found not to be statistically significant p >0.05.

Heart rates of group D (78.00 ± 6.968, 75.47 ± 7.133, 73.07 ± 6.533, 70.93 ±6 .868, 67.43 ± 5.964, 64.93 ± 5.502, 62.93 ± 4.593, 62.07 ± 4.849 and 62.13 ± 5.036) was compared with group P (75.43 ±6.506, 73.33 ±6.337, 71.57 ±5.746, 69.97 ±5.997, 67.43 ±5.077 , 65.83 ±5.018 , 64.50 ±4.108 , 63.33 ± 4.420 and64.40 ±3.865) throughout the procedure and found not to be statistically significant p >0.05.

The lowest heart rate in group D was 50 and in group P was 52, no intervention was needed in either of the cases.

Respiratory rate of group D (16.00 ±1.259, 15.70 ±0.877, 15.60 ± 1.248, 15.33 ±0.758, 15.57 ±1.305, 15.50 ±1.106, 15.77 ±1.331, 16.10 ±1.373 and 15.87 ±1.167) was compared with group P (16.13 ±1.332, 15.67 ±0.922, 15.40 ±1.192, 15.30 ±0.750, 15.53 ±1.332, 15.60 ±1.333, 15.83 ±1.262, 15.83 ±1.315 and 15.97 ±0.999) throughout the procedure and found not to be statistically significant as p >0.05.

Saturation levels of group D (97.97± 0.809, 98.20 ±0.664, 98.07 ±0.828, 98.27 ±1.015, 98.60 ±1.192, 98.47 ±1.252, 98.17 ±1.177, 98.23 ±0.774 and 98.60 ±0.770) was compared with group P (98.03 ±0.850, 98.30 ±0.750, 98.07 ±0.907, 98.17 ±1.053, 98.37 ±1.299, 98.40 ±1.221, 98.00 ±1.144, 98.30 ± 0.794 and 98.67 ±0.802) throughout the procedure and found not to be statistically significant as p >0.05. No episodes of respiratory depression or oxygen desaturation were observed in either group. Ramsay sedation scale of 3 was maintained during the operation in both the group D and group P.

Table 1: Distribution of Study Groups

STUDY GROUP	FREQUENCY	PERCENT
DEXMEDETOMI DINE	30	50.0
PROPOFOL	30	50.0
TOTAL	**60**	**100.0**

The above table shows the total number of patients distributed into each study group.

Table 2: Sex Distribution of Study Groups

SEX	FREQUENCY	PERCENT
MALE	30	50.0
FEMALE	30	50.0
TOTAL	**60**	**100.0**

The above table shows the total number of male and female patients distributed into each study group.

Table 3: Sex Distribution of Each Study Groups Individually

	SEX		
STUDY GROUP	**MALE**	**FEMALE**	**TOTAL**
DEXMEDETOMIDINE	15 (50.0 %)	15 (50.0 %)	30(50.0 %)
PROPOFOL	15 (50 .0%)	15 (50.0 %)	30(50.0%)
TOTAL	**30 (100.0 %)**	**30(100.0 %)**	**60(100.0 %)**

The above table shows the number of male and female patients distributed and percentage of the female and male patients into each study group separately.

Table 4: Mean age distribution of study groups

PARAMETER	DRUG	N	Mean	Std. Deviation	P value
AGE	DEXMEDETOMI DINE	30	56.70	5.503	**.924**
	PROPOFOL	30	56.57	5.224	

The above table shows the mean age distribution of both the study groups. It can be seen that the difference in mean age between the two study groups is not statistically significant. (p>0.05).

Table 5: Mean Weight Distribution of Study Groups

PARAMETER	DRUG	N	Mean	Std. Deviation	P value
WEIGHT	DEXMEDETOMIDINE	30	63.63	8.479	**.689**
	PROPOFOL	30	64.63	10.669	

The above table shows the mean weight of both the study groups. It can be seen that the difference in mean weight between the two groups is not statistically significant. (p>0.05).

Table 6: Mean ISAS Score Distribution of Study Groups

PARAMETER	DRUG	N	Mean	Std. Deviation	P value
ISAS SCORE	DEXMEDETOMIDINE	30	53.50	2.193	**.0001*S**
	PROPOFOL	30	43.10	2.090	

The above table shows the ISAS score of both the study groups. It can be seen that the difference in ISAS score between the two study groups is statistically significant. (p<0.05).

Table 7: Comparison of Mean Arterial Blood Pressure (MAP) in Both the Study Groups

PARAMETER	DRUG	N	Mean	Std. Deviation
MAPT1	DEXMEDETOMIDINE	30	88.77	12.931
	PROPOFOL	30	83.23	11.196
MAPT2	DEXMEDETOMIDINE	30	84.00	12.575
	PROPOFOL	30	79.23	10.753
MAPT3	DEXMEDETOMIDINE	30	80.13	12.079
	PROPOFOL	30	76.33	9.852
MAPT4	DEXMEDETOMIDINE	30	75.67	11.198
	PROPOFOL	30	73.57	8.985
MAPT5	DEXMEDETOMIDINE	30	72.33	9.151
	PROPOFOL	30	72.00	7.661
MAPT6	DEXMEDETOMIDINE	30	71.50	6.585
	PROPOFOL	30	70.37	6.620
MAPT7	DEXMEDETOMIDINE	30	69.87	5.788
	PROPOFOL	30	68.63	5.499
MAPT8	DEXMEDETOMIDINE	30	70.60	5.430
	PROPOFOL	30	67.87	5.692
MAPT9	DEXMEDETOMIDINE	30	70.27	5.199
	PROPOFOL	30	67.87	5.692

The above table shows the (MAP) Mean Arterial Pressures of both the study groups at various time points from T1 to T9. It can be seen that the difference in MAP between two study groups is not statistically significant. (p>0.05).

Table 8: Comparison of Mean Heart Rate in Both the Study Groups

PARAMETER	DRUG	N	MEAN	STD.DEVIATION	P VALUE
HRT1	DEXMEDETOMIDINE	30	78.00	6.968	.146
	PROPOFOL	30	75.43	6.506	
HRT2	DEXMEDETOMIDINE	30	75.47	7.133	.226
	PROPOFOL	30	73.33	6.337	
HRT3	DEXMEDETOMIDINE	30	73.07	6.523	.348
	PROPOFOL	30	71.57	5.746	
HRT4	DEXMEDETOMIDINE	30	70.93	6.868	.564
	PROPOFOL	30	69.97	5.997	
HRT5	DEXMEDETOMIDINE	30	67.43	5.964	1.000
	PROPOFOL	30	67.43	5.077	
HRT6	DEXMEDETOMIDINE	30	64.93	5.502	.511
	PROPOFOL	30	65.83	5.018	
HRT7	DEXMEDETOMIDINE	30	62.93	4.593	.169
	PROPOFOL	30	64.50	4.108	
HRT8	DEXMEDETOMIDINE	30	62.07	4.849	.295
	PROPOFOL	30	63.33	4.420	
HRT9	DEXMEDETOMIDINE	30	62.13	5.036	.056

The above table shows the heart rate of both the study groups at various time points from T1 to T9. It can be seen that the heart rate difference between two study groups is not statistically significant (p>0.05).

Table 9: Comparison of Mean Respiratory Rate in Both the Study Groups

PARAMETER	DRUG	N	Mean	Std. Deviation	P value
RRT1	DEXMEDETOMIDINE	30	16	1.259	**0.692**
	PROPOFOL	30	16.13	1.332	
RRT2	DEXMEDETOMIDINE	30	15.7	0.877	**0.316**
	PROPOFOL	30	15.67	0.922	
RRT3	DEXMEDETOMIDINE	30	15.6	1.248	**0.528**
	PROPOFOL	30	15.4	1.192	
RRT4	DEXMEDETOMIDINE	30	15.33	0.758	**0.865**
	PROPOFOL	30	15.3	0.75	
RRT5	DEXMEDETOMIDINE	30	15.57	1.305	**0.922**
	PROPOFOL	30	15.53	1.332	
RRT6	DEXMEDETOMIDINE	30	15.5	1.106	**0.731**
	PROPOFOL	30	15.6	1.133	
RRT7	DEXMEDETOMIDINE	30	15.77	1.331	**0.843**
	PROPOFOL	30	15.83	1.262	
RRT8	DEXMEDETOMIDINE	30	16.1	1.373	**0.446**
	PROPOFOL	30	15.83	1.315	
RRT9	DEXMEDETOMIDINE	30	15.87	1.167	**0.723**
	PROPOFOL	30	15.97	0.999	

The above table shows the RR (Respiratory Rate) of both the study groups at various time points from T1 to T9. It can be seen that the RR difference between the two study groups is not statistically significant. (p >0.05).

Table 10: Comparison of Mean Saturation in Both the Study Groups

PARAMETER	DRUG	N	Mean	Std. Deviation	P value
ST1	DEXMEDETOMIDINE	30	97.97	.809	**.757**
	PROPOFOL	30	98.03	.850	
ST2	DEXMEDETOMIDINE	30	98.20	.664	**.587**
	PROPOFOL	30	98.30	.750	
ST3	DEXMEDETOMIDINE	30	98.07	.828	**1.000**
	PROPOFOL	30	98.07	.907	
ST4	DEXMEDETOMIDINE	30	98.27	1.015	**.709**
	PROPOFOL	30	98.17	1.053	
ST5	DEXMEDETOMIDINE	30	98.60	1.192	**.471**
	PROPOFOL	30	98.37	1.299	
ST6	DEXMEDETOMIDINE	30	98.47	1.252	**.835**
	PROPOFOL	30	98.40	1.221	
ST7	DEXMEDETOMIDINE	30	98.17	1.177	**.575**
	PROPOFOL	30	98.00	1.114	
ST8	DEXMEDETOMIDINE	30	98.23	.774	**.743**
	PROPOFOL	30	98.30	.794	
ST9	DEXMEDETOMIDINE	30	98.60	.770	**.744**
	PROPOFOL	30	98.67	.802	

The above table shows the ST (Saturation) of both the study groups at various time points from T1 to T9. It can be seen that the difference between the two study groups is not statistically significant (p>0.05).

DISCUSSION

Results suggest that dexmedetomidine is an effective and safe drug for MAC in outpatients undergoing cataract surgery. Many studies were undertaken comparing dexmedetomidine with propofol for short surgical procedures, day care surgeries under MAC.

Previous studies have reported that dexmedetomidine can also be used effectively in cataract surgery.

Ayoglu et al,[11] demonstrated that intraocular pressure was decreased and satisfactory sedation and analgesia were achieved by a sole loading infusion of 1 mcg/kg dexmedetomidine for 10 min preoperatively.

40 patients (ASA I–II, 50–75 yr) were randomized to receive either dexmedetomidine sedation (Group D) or no intra operative sedation (Group C) during cataract surgery performed under peribulbar–retrobulbar block. Group D received a loading dose of 1 mcg/ kg dexmedetomidine for 10 min. When additional sedation was needed, dexmedetomidine 2 mcg/ml for patient-controlled sedation (PCS) was prepared. The PCS settings were a dose of 5 mcg and a lockout interval of 10 min. Additional doses were recorded. The study groups were compared with respect to intraocular pressure, haemodynamic variables, perception of pain during local anaesthetic injection by using Numeric rating scale (NRS), intra operative Ramsay Sedation Score (RSS), Aldrete Scores in postoperative first 30 min, incidence of intra operative complications, patient and surgeon satisfaction by using NRS.

The mean dexmedetomidine dose of the Group D was [66.4 (3.7)] mcg. In Group D, intra operative mean heart rate was found to be lower up to 50 min

(P<0.05) and arterial pressure lower up to 30th min (P<0.05). NRS values during retrobulbar block were lower in Group D [1.9 (0.5)], compared with Group C [3.9 (0.6)] (P=0.016). After the dexmedetomidine loading dose, intraocular pressure (IOP) was significantly decreased [12.3 (1.0) mm Hg] compared with preoperative value [16.1 (0.8) mm Hg] (P<0.05). Intra operative RSS were higher in Group D after the loading dose of dexmedetomidine (P<0.05). Incidences of mouth dryness were higher in the Group D after surgery (P<0.05), but patient satisfaction was also higher (P=0.001). There were no differences in Aldrete Scores or surgeon satisfaction scores between the groups.

This study demonstrates that sedation with dexmedetomidine decreases intraocular pressure, pain on injection and provides sedation effectively without causing respiratory depression. A single dose of dexmedetomidine appears to be enough. Dexmedetomidine sedation enables full cooperation and potentially better operating conditions without significant respiratory depression.

Apan et al,[12] also reported that dexmedetomidine made the intra operative HR more stable and postoperative pain less severe compared with midazolam, thus it was appropriate for sedation and analgesia during MAC in cataract surgery.

This study evaluated the role of α2 agonist infusion, with dexmedetomidine or midazolam, on haemodynamic and respiratory parameters while titrating the sedation level with the bispectral index (BIS) during cataract surgery.

Ninety consenting ASA class I-III patients who were electively undergoing cataract surgery were enrolled in the double blind study. A random infusion of 0.25 mcg/ kg/ hr dexmedetomidine (Group D), 25 mcg/ kg/ hr midazolam (Group M), or saline for controls (Group C) was administered after mounting a BIS monitor and routine anaesthetic care. The target BIS level was >85. An additional bolus dose in 1 millilitres increments of the study drug or cessation of the infusion was adjusted according to the BIS level. Changes in respiratory and vital parameters were noted and, in case of mild pain, 25mcg fentanyl was administered as a bolus. Pain and sedation were evaluated in the early postoperative period using visual analogue and four rating sedation scales.

Results showed in Group D, heart rate decreased in the later periods of surgery (35-50 min) and in the early postoperative period (5 (th) and 15 (th) min). Dose adjustments were required in six and ten patients in Groups D and M, respectively. Pain scores were lower with dexmedetomidine infusion.

The study concluded that dexmedetomidine infusion mildly decreased heart rate in the later periods of surgery with better pain scores in the postoperative period. Dexmedetomidine should be an alternative for intra operative sedation in outpatients undergoing cataract surgery.

Reetu, Verma et al,[13] studied ‘‘Efficacy and safety of intravenous dexmedetomidine in comparison to propofolfor MAC in middle ear surgery” ,a Randomized controlled trial, made similar conclusions supporting the present study, suggested thatdexmedetomidine is a better drug for MAC with minimal haemodynamic instability when compared to propofol.

In this study 80 patients were randomly allocated to receive either dexmedetomidine or propofol as intravenous bolus followed by the same in infusion supplemented with local anaesthesia for tympanoplasty. Results showed that dexmedetomidine and propofol provides adequate sedation but the use of propofol is associated with more requirements of rescue analgesia and poor patient and surgeon satisfaction.

Ashraf S. Hasanin, Ahmad M.Sira,[14] compared both the drugs in paediatric patient during Gastrointestinal Endoscopy and concluded that dexmedetomidine sedation during Gastrointestinal endoscopy provides more safety and heart rate stability presenting itself as a suitable alternative agent especially for the relatively longer procedures.

In this study eighty paediatric patients ASA I/II aged 1–14 years, scheduled for gastrointestinal endoscopy were randomized into dexmedetomidine group or propofol group. Sedation was achieved with propofol 2 mg/kg bolus then infused at 100mcg/kg/min or dexmedetomidine 2.5mcg/kg over 10 min then infused at 2mcg/kg/h to achieve a Ramsay sedation scale of 5. HR, MAP, RR and SPO2 were continuously monitored and analyzed at (T0) baseline, (T1) after induction, (T2) after insertion of endoscope, (T3) during procedure, (T4) recovery period. Times of induction, procedure, and recovery were reported together with any adverse effects.

HR values were significantly lower in dexmedetomidine group at T1, T2 and T3 (83.9. HR values were significantly lower in dexmedetomidine group at T1, T2 and T3 (83.95 ± 13.79 versus 92.95 ± 12.38, 103.35 ± 15.34 versus 112.75 ± 12.79 and 90.80 ± 13.99 versus 104.05 ± 10.73) beats/min respectively, (p-value < 0.05). No significant differences were found in MAP, RR and SPO2 values between groups at all-time points.

Induction and recovery times were significantly longer in dexmedetomidine group 10.51 ± 1.75 versus 3.17 ± 0.72 min and 28.55 ± 7.95 versus 13.68 ± 3.35 min (p-value < 0.001). Seven patients in dexmedetomidine group (17.5%) versus one patient in propofol group (2.5%) showed unwanted movement (p-value 0.057), and no cases in dexmedetomidine group demonstrated oxygen desaturation versus 6 patients (15%) within propofol group (p-value 0.026).

Studies were also done comparing dexmedetomidine in combination with different sedatives versus various other combinations of sedatives.

Fifty patients undergoing dacrocystorhinostomy surgery under regional anaesthesia were divided into two groups. The first group received Dexmedetomidine plus Ketamine (group DK, n =

25). The patients received an infusion of 0.5 mcg/kg/h of dexmedetomidine and 0.5 mg/kg/h of ketamine. The second group received Propofol plus Ketamine (group PK, n = 25), the patients received 0.5mg/kg/min of Propofol and 0.5mg/kg/h of ketamine by infusion. Haemodynamic data, respiratory rate, and sedation.

This study evaluated the haemodynamic effects, suitability and safety of dexmedetomidine (DEX) compared with propofol (PRO) in older adults having outpatient cataract surgery under monitored anaesthesia care. The patients, surgeon and the anaesthesia staff evaluated satisfaction for both drugs. This prospective, single blind, randomized study was conducted using forty-seven patients ≥55 years old undergoing cataract surgery. The two patient groups received either intravenous dexmedetomidine 1 mcg/kg over 10 min; followed by maintenance intravenous infusion at 0.2 - 0.7 mcg/kg/hr (DEX group, N = 24), or propofol infused between 25 - 120 mcg/kg/min (PRO group, N = 23). Both agents were titrated to patient comfort.

Results showed that patients mean arterial pressures (SEM) at baseline were 104.7 (2.6) and 107.5 (2.7) mmHg for the DEX and PRO groups, respectively ($p = 0.45$). At discharge the pressures were 78.1 (2.5) and 98.1 (2.6) mmHg in DEX and PRO groups, respectively ($p < 0.05$). Patient's heart rates (SEM) at baseline were 74.8 (3.0) for the DEX group and 73.2 (2.8) beats per minute for the PRO groups ($p = 0.71$). At the time of discharge following surgery, the mean heart rate for the DEX group was 61.5 (2.2) beats per minute vs. 69.1 (2.3) beats per minute ($p < 0.05$) for the PRO group. Three patients in the DEX group developed complications precluding discharge or requiring readmission while none of the patience in the PRO group had complications ($p = 0.08$). Patient and surgeon satisfaction scores were similar between the groups.

The study concluded dexmedetomidine is a less suitable sedative compared with propofol for use in older patients undergoing cataract surgery due to decrease in haemodynamic parameters and noted increases in complication rates.

The reason for these contrasting results between this study and the present study could be

1. The loading dosage of intravenous dexmedetomidine 1 mcg/kg over 10 min followed by maintenance intravenous infusion at 0.2 - 0.7mcg/kg/hr whereas in the present study a loading dose was not given, only 0.2 - 0.7mcg/kg/hr infusion.
2. Even this infusion was titrated to RSS of 3, which was not done in the previous study leading to statistically significant fall in blood pressure and increases in complication rates.

Most of the patients were outpatients and elderly, thus we suggest that dexmedetomidine has more advantages over other commonly used sedatives. In addition to previous affirmative results,[13] such as sedative plus analgesic properties, stable haemodynamic state, and low intraocular pressure, dexmedetomidine should be recommended for MAC in cataract surgery.

Combined use of benzodiazepine and opioid may be associated with a potential risk for developing delirium, whereas, dexmedetomidine can minimize the occurrence of delirium in critically ill or elderly patients. The incidence of delirium was 50% in patients receiving propofol or midazolam for postoperative sedation; however, only 3% of patients receiving dexmedetomidine presented postoperative delirium.[15] This is yet another advantage of dexmedetomidine as a sedative in patients with high risks of delirium.

In conclusion, the present study showed that dexmedetomidine seems to be an acceptable agent for MAC in outpatients undergoing cataract surgery. Compared with propofol, dexmedetomidine reduced arterial pressure during the period of operation. Satisfaction scores were also in favor of the patients treated with dexmedetomidine.

CONCLUSION

The study showed that dexmedetomidine seems to be an acceptable, superior sedative agent and with a better satisfaction scores for Monitored Anaesthesia Care, compared to propofol in patients undergoing cataract surgery.

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Conflict of Interest: None

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