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Original Research Article

Study to observe changes at 120 minutes of oral melatonin premedication on induction doses of pentothal sodium and propofol.

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Abstract:

Background & Method: The aim of the study is to observe changes in vital parameters before and after 90-120 minutes of oral melatonin premedication on induction doses of pentothal sodium and propofol. All patients fulfilling the inclusion criteria were given general anaesthesia at our study. Study was carried out on patients of ASA grade 1 and ASA grade 2 category between age group 18 to 60 years, scheduled to undergo elective surgery under General Anaesthesia.

Result: The mean SBP 120 minutes after drugs was significantly less in PS + M Group compared to P + M Group, PS Group and P Group. The mean SBP pre induction was not significantly less in P + M Group compared to PS + M Group, P Group and PS Group. We observed that the mean DBP preinduction was not significantly more on PS group compared to P Group, P + M Group and PS + M Group and the mean DBP 120 minutes after drugs was significantly more in PS Group compared to P Group, P + M Group and PS + M Group and the mean DBP pre induction was significantly lower in PS + M Group compared to P + M Group, P Group and PS Group.

Conclusion: We concluded that statistically significant effect was found when oral melatonin used as premedication was given before induction doses of propofol and Pentothal sodium and changes in the vital parameters were observed 120 minutes after administration of study drug.

Keywords: oral melatonin, premedication, pentothal, sodium and propofol.

Study Designed:

1. Introduction

Melatonin related analgesic effects may be due to the action of two melatonin receptors, γ-aminobutyric acid receptor and opioid receptors[1]. Melatonin increases the level of β-endorphins in MT2 receptor in spinal cord and is an effective premedication due to its sedative, anti-oxidative, analgesic, anti-inflammatory and chronobiotic properties. The review has discovered that melatonin is an effective premedication in adults with controversial anaesthetic effects. Premedication with sublingual and orally administered melatonin (0.05, 0.1, or 0.2 mg/kg) has been proven to decrease anxiety and provide less troublesome sedation

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in surgery or a undesirable impact on the quality of recovery[2]. Ismail and Mowafi in their study on the effect of orally administered melatonin 10 mg as a premedication found that it offered better operating conditions like decreased intraocular pressure and increased analgesia including pain caused by injuries.

Melatonin also labelled as a master hormone once is naturally present in majority of organisms. It is produced mainly in the pineal gland of all mammals and vertebrates and its secreted in high amount during night and low during day time. It is also synthesized in other organs and tissues from tryptophan[3]. It is also a natural constituent of food which includes cherries, beet, rice, cucumber, human milk, tomatoes, yeast, bananas, wine and beer[4]. Melatonin plays several important physiological roles having important clinical applications. Some clinical trials have provided a basis for future clinical applications to the anaesthesiologist. Keeping this in mind, we conducted a search of literature to review the various roles of melatonin and explore its various potential uses in anaesthesia and critical care medicine[5].

Propofol is an intravenous anaesthetic used during monitored anaesthesia care and as an induction agent for general anaesthesia, administered as a bolus or an infusion. It is prepared in a lipid emulsion which gives it milky white appearance named the "milk of amnesia." The formula contents include soybean oil, glycerol, egg lecithin, and the preservative EDTA[6].

2. Material & Method

Present study was conducted at Index Medical College, Indore for 01 Year. The patients were examined clinically a day before and melatonin tablet was administered orally 90-120 minutes before surgery after taking the vital signs parameters such as demographic data, baseline heart rate, blood pressure.

All patients fulfilling the inclusion criteria were given general Anesthesia in our institute. The study was carried out on patients belonging to ASA 1 and ASA 2 grade patients between age 18 to 60 years undergoing elective surgery under general anaesthesia.

Inclusion criteria

1. Patients belonging to ASA I and II
2. Age group – 18 to 60 years of age
3. All patients scheduled for routine elective surgeries to be performed under general anesthesia.

Exclusion criteria

1. Patient refusal for inclusion in study.
2. Patients belonging to American Society of Anaesthesiologists grade 3 and 4.

3. Results

Table 1: Distribution of mean Age (Years): Group

		Number	Mean	SD	Minimum	Maximum	Median	p-value
	P	31	39.7097	11.7621	20.0000	60.0000	40.0000	
Age (Years)	P + M	31	38.8710	12.9351	19.0000	60.0000	35.0000	
	PS	31	36.0323	10.5751	22.0000	55.0000	32.0000	
	PS+M	31	37.3871	13.5491	19.0000	60.0000	38.0000	0.6523

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In P Group, the mean Age (Years) (mean± s.d.) of patients was 39.7097± 11.7621. In P + M Group, the mean Age (Years) (mean±s.d.) of patients was 38.8710 ± 12.9351. In PS Group, the mean Age (Years) (mean±s.d.) of patients was 36.0323± 10.5751. In PS + M Group, the mean Age (Years) (mean±s.d.) of patients was 37.3871± 13.5491. Distribution of mean Age (Years) with Group was not statistically significant (p=0.6523).

Table 2: Distribution of mean Weight (kg): Group

		Number	Mean	SD	Minimum	Maximum	Median	p-value
Weight (kg)	P	31	55.1613	9.5642	41.0000	75.0000	52.0000	<0.001
	P + M	31	65.6774	12.0841	44.0000	90.0000	67.0000	
	PS	31	63.9032	7.4492	50.0000	80.0000	62.0000	
	PS + M	31	69.4194	12.5373	46.0000	88.0000	70.0000	

In P Group, the mean Weight (kg) (mean± s.d.) of patients was 55.1613± 9.5642. In P + M Group, the mean Weight (kg) (mean± s.d.) of patients was 65.6774± 12.0841. In PS Group, the mean Weight (kg) (mean± s.d.) of patients was 63.9032± 7.4492. In PS + M Group, the mean Weight (kg) (mean± s.d.) of patients was 69.4194± 12.5373. Distribution of mean Weight (kg) with Group was statistically significant (p<0.0001).

Table 3: Distribution of mean SBP 120 minutes after drugs: Group

	Number	Mean	SD	Minimum	Maximum	Median	p-value
P	31	130.1935	11.2351	109.0000	163.0000	130.0000	0.0001
P + M	31	115.9032	9.7924	98.0000	130.0000	116.0000	
PS	31	129.7097	9.0892	108.0000	148.0000	130.0000	

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PS + M	31	115.7742	8.4250	100.0000	132.0000	114.0000	

In P Group, the mean SBP 120 minutes after drugs (mean± s.d.) of patients was 130.1935± 11.2351. In P + M Group, the mean SBP 120 minutes after drugs (mean± s.d.) of patients was 115.9032± 9.7924. In PS Group, the mean SBP 120 minutes after drugs (mean± s.d.) of patients was 129.7097± 9.0892. In PS + M Group, the mean SBP 120 minutes after drugs (mean± s.d.) of patients was 115.7742± 8.4250. Distribution of mean SBP 120 minutes after drugs with Group was statistically significant (p=0.0001).

Table 4: Distribution of mean DBP 120 minutes after drugs: Group

		Number	Mean	SD	Minimum	Maximum	Median	p-value
DBP 120 minutes after drugs	P	31	84.9677	6.4729	66.0000	97.0000	86.0000	<0.0001
	P + M	31	75.8710	6.8300	60.0000	84.0000	78.0000	
	PS	31	85.1935	7.5119	70.0000	102.0000	84.0000	
	PS + M	31	73.8387	7.1838	59.0000	91.0000	73.0000	

In P Group, the mean DBP 120 minutes after drugs (mean± s.d.) of patients was 84.9677± 6.4729. In P + M Group, the mean DBP 120 minutes after drugs (mean± s.d.) of patients was 75.8710± 6.8300. In PS Group, the mean DBP 120 minutes after drugs (mean± s.d.) of patients was 85.1935± 7.5119. In PS + M Group, the mean DBP 120 minutes after drugs (mean± s.d.) of patients was 73.8387± 7.1838. Distribution of mean DBP 120 minutes after drugs with Group was statistically significant (p<0.0001).

4. Discussion

In our study we compared the role and efficacy of preoperative oral melatonin on the dose required of propofol and thiopental sodium as an induction agent. In our study the mean age group of the patients were compared between both the groups, we found that distribution of mean age in both the groups were not statistically significant. distribution of mean weight was compared in all the groups and we observed that in group PS+M distribution of mean weight was higher and statistically significant . Similarly mean SBP 120 minutes after administration of drug was significantly lower in PS +M group.

In our study, distribution of mean DBP 120 minutes after administration of drug was significantly lower in PS+M. So in our study we found that mean SBP and mean DBP 120

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minutes after administration of drug was statistically lower in PS +M group in comparison to P+M group, P Group and PS group.

Norouzi A et al observed the effect of melatonin premedication on propofol induction dose for anesthesia in abdominal surgery in Valiasr Hospital, Iran randomized into two groups: melatonin and placebo groups. They were sublingually administered 3 mg of melatonin and placebo, respectively, 50 minutes prior to the surgery. They also recorded the propofol induction dose required for general anaesthesia[7].

Roy K et al compared the role and efficacy of preoperative oral Melatonin, Ramelteon, and Midazolam therapy on the dose required for propofol as an induction agent among Case and Control Group. Case group were given Oral Melatonin (6mg) or Ramelteon (8mg) as a premedication 2 to 3 hours prior to the induction in OT and the control group was given oral Midazolam (5mg) [8].

Mohamed EE et al observed the role of melatonin in different doses as a premedication in decreasing the induction dose of propofol for anesthesia, pain preoperative anxiety and sedation post abdominal surgery. In our study, the mean Dose was calculated as mg/kg was lower in [1.0932±.0754] P + M Group compared to [1.9529± .1710] P Group, [2.6835±.3678] PS+ M Group and [4.6161± .3666] PS Group which was statistically significant ($p<0.0001$) [9].

Naguib M et al found that the effect of melatonin on the intra-operative requirements for IV anaesthetics has not been recorded. Approximately 50 minutes later, subgroups of 10 melatonin and 10 placebo patients were administered various doses of propofol (0.5, 1.0, 1.5, 2.0, or 2.4 mg/kg) or thiopental (2.0, 3.0, 4.0, 5.0, or 6.0 mg/kg) for anesthetic induction[10].

5. Conclusion

We concluded that statistically significant effect was found when oral melatonin used as premedication was given before induction doses of propofol and Pentothal sodium and changes in the vital parameters were observed 120 minutes after administration of study drug.

6. References

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