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A PROSPECTIVE STUDY TO ASSESS THE DOSING OF PROPOFOL FOR INDUCTION BASED ON LEAN BODY MASS VS TOTAL BODY WEIGHT IN ATTAINING SURGICAL PLANE OF ANAESTHESIA.

Anaesthesiology

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ABSTRACT

To assess the dosing of propofol for induction based on lean body mass and total body weight in attaining surgical plane of anaesthesia using bispectral index in mixed population . **Study design:** This is a randomized, single blinded prospective study. Sample size was calculated to be 50, equally divided into two groups. **MATERIALS & METHODOLOGY :** Among the 50 patients 4 were not meeting eligibility criterias and they were excluded form the study. Among the Randomized population of 46, 23 were studied under Group A,Propofol dose based on total body weight and 23 were studied under Group B, Propofol dose based on Lean body mass. The calculated dose of propofol was injected over a standard duration of 45 sec and BIS score is monitored at an interval of 30 sec duration for 3 minutes. At 1 min 30 sec BIS score is compared in both groups and if surgical plane was achieved proceeded for intubation .Patients were bag-and-mask ventilated after Loss of consciousness and intubation was performed .During intubation the BIS score was recorded . **CONCLUSION:** Dosing of propofol for induction based on lean body mass was better when compared to total body weight in attaining surgical plane of anaesthesia using bispectral index .For a lower dose of propofol in LBW group there was no awareness during induction and during intubation.Utilization of BIS monitor prevents drug overdosing

KEYWORDS

Induction, Propofol, Anaesthesia, BIS score.

INTRODUCTION

Propofol is a highly lipophilic agent and is commonly used for anaesthesia induction.Intravenous drug doses are scaled according to total body mass usually which can result in over dosing in obese individuals.

AIM OF THE STUDY

To assess the dosing of propofol for induction based on lean body mass and total body weight in attaining surgical plane of anaesthesia using bispectral index in mixed population .

METHODS & MATERIALS

Hospital ethical committee approval obtained. This is a randomized, single blinded prospective study. Sample size was calculated to be 50, equally divided into two groups (power set at 80 % , α error less 0.05) – Group A based on total body weight and group B based on lean body mass . Based on inclusion and exclusion criteria , patients who consented for the study are allocated into either of the two groups by computer generated randomization scheme. Duration of study : 6 months. Patients with the age group of 30 to 70years who were assessed under ASA I & ASA II for elective surgeries with the BMI 18.5 to 40 were included in this study.Patients aged more than 70 years, who were assessed under ASA III & Iv, known history of Propofol allergy , associated co morbidities like unstable cardiovascular diseases were excluded from this study.Among the 50 patients 4 were not meeting eligibility criterias and they were excluded form the study. Among the Randomized population of 46, 23 were studied under Group A,Propofol dose based on total body weight and 23 were studied under Group B, Propofol dose based on Lean body mass.All patients were weighed on the same scale in our preoperative clinic . The LBW was calculated from the recorded TBW using Janmahasatian equation . LBW (kg) in men = 9270.TBW /6680 + (216 .BMI)LBW (kg) in women = 9270 .TBW /8780 + (244. BMI)

METHODOLOGY

After obtaining consent , BIS electrode is applied to the participants forehead according to the instructions .Standard monitors were connected . These include ECG ,SPO2 , NIBP , ETCO2 and the pre operative values are recorded.Before induction an intravenous cannula was inserted , Ringer lactate was on flow .

GROUP A

Premedicated with Inj .Ranitidine 50 mg,Inj .Metoclopramide 10 mg and Inj . Glycopyrolate 0.005 mg/kg, then induced with Inj.propofol 2mg/kg (Based on Total body weight),Inj.midazolam 0.03 mg/kg,Inj.fentanyl 2 mic/kg then intubated with Inj .Suxamethonium 2 mg/kg,maintained with sevoflurane(2%) ,and inj .atracurium 0.5mg/kg .

GROUP B

Premedicated with Inj .Ranitidine 50 mg,Inj .Metoclopramide 10 mg and Inj . Glycopyrolate 0.005 mg/kg, then induced with Inj.propofol 2mg/kg (Based on Lean body mass) Inj.midazolam 0.03 mg/kg,Inj.fentanyl 2 mic/kg then intubated with Inj .Suxamethonium 2 mg/kg,maintained with sevoflurane(2%) ,and inj .atracurium 0.5mg/kg .

The calculated dose of propofol was injected over a standard duration of 45 sec and BIS score is monitored at an interval of 30 sec duration for 3 minutes. At 1 min 30 sec BIS score is compared in both groups and if surgical plane was achieved proceeded for intubation .Patients were bag-and-mask ventilated after Loss of consciousness and intubation was performed .During intubation the BIS score was recorded .

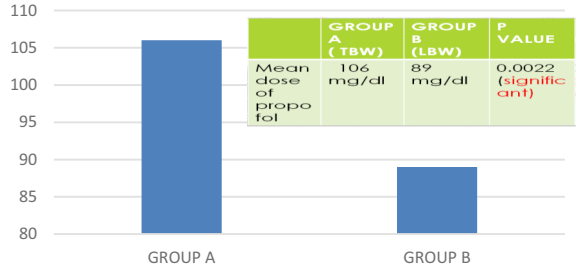
After the pre-calculated dose of propofol was administered , Heart rate, MAP, the time taken to achieve the target BIS score, the lowest BIS score achieved ,Loss of consciousness (the patient does not respond to a painful trapezius squeeze) ,presence of tears or frowning, BIS score during intubation , BIS score when sevoflurane was introduced are noted .

STATISTICAL ANALYSIS

In both the groups data was collected in Proforma chart entered in excel spread sheet and analysed with SPSS 17.0 software .P value analysed with student t test and values less than 0.05 are considered significant.

RESULTS

Overall demographic characteristics in both groups were similar and they are comparable.



	GROUP A (TBW)	GROUP B (LBW)	P VALUE
Mean dose of propofol	106 mg/dl	89 mg/dl	0.0022 (significant)

FIGURE 1: COMPARISION OF LBW BETWEEN TWO GROUPS

There is significant reduction in the mean propofol dose in lean body weight group.

TIME	GROUP A		GROUP B		P VALUE
	MEAN	SD	MEAN	SD	
PREOP	86	7.56	88	8.33	0.65
30 SEC	90	7.19	95	7.61	0.66
1MIN	92	6.32	98	6.66	0.72
1 MIN 30 SEC	96	7.39	100	6.51	0.68
2 MIN	92	6.33	98	6.66	0.66
2 MIN 30 SEC	88	6.77	84	7.01	069
3 MIN	94	6.82	100	6.88	0.71

FIGURE 2: Mean heart rate comparison between two groups

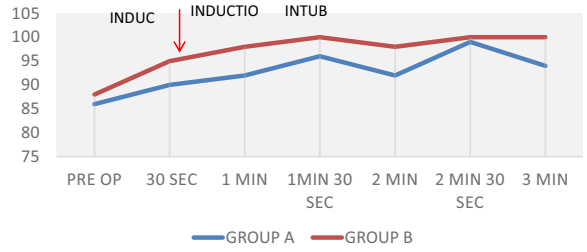


FIGURE 3 : INDUCTION & INTUBATION

TABLE NO 1 : MEAN ARTERIAL PRESSURE BETWEEN TWO GROUPS

TIME	GROUP A		GROUP B		P VALUE
	MEAN	SD	MEAN	SD	
PREOP	93	4.1	95	4.6	0.069
30 SEC	88	3.8	90	4.3	0.071
1 MIN	69	3.9	83	4.6	0.044
1MIN 30 SEC	61	4.1	70	3.8	0.049
2 MIN	75	3.8	80	4.9	0.069
2 MIN 30 SEC	80	4.6	90	3.9	0.068
3 MIN	92	4.1	98	4.1	0.078

The incidence fall of mean arterial pressure was significantly lower in LBW group.The BP fall started at 30 sec , peak fall of BP was at 1 min 30 sec and started regaining at 3min .The peak fall of MAP correlate with the lowest BIS score .

TABLE NO 2: BIS SCORE

TIME	GROUP A		GROUP B		P VALUE
	MEAN	SD	MEAN	SD	
PRE OP	88	2.68	89	2.66	0.065
30 SEC	78	2.73	79	2.77	0.067
1MIN	50	1.88	58	2.34	0.071
1 MIN 30 SEC	42	2.11	47	2.34	0.073
2 MIN	45	1.99	45	2.71	0.076
2 MIN 30 SEC	47	2.01	50	2.88	0.061
3 MIN	55	2.22	58	2.73	0.062

BIS Score was comparable and statistically insignificant.The peak fall of BIS score was at 1 min 30 sec which correlate with the lowest level of BP fall .

TABLE NO 3: COMPARISION BETWEEN TWO GROUPS

MEAN	GROUP A	GROUP B	P value
TIME TAKEN FOR LOSS OF CONSCIOUSNESS	48 sec	52 sec	0.61 (NOT SIGNIFICANT)
LOWEST BIS SCORE ACHIEVED	39	41	0.71(NOT SIGNIFICANT)
TIME TAKEN TO ACHIEVE LOWEST BIS SCORE	1 min 40 sec	1 min 50 sec	0.66(NOT SIGNIFICANT)
BIS SCORE WHEN INHALATION IS INTRODUCED	40	42	0.70(NOT SIGNIFICANT)

DISCUSSIONS

LEAN BODY WEIGHT

The total dose of propofol is significantly reduced , adequate and additional dose of propofol was not needed in Lean body weight group .Heart rate is comparable to total body weight group .Fall of MAP is significantly lower in lean body weight group .Target BIS score was achieved in Lean body weight group.When inhalational was introduced adequate surgical plane was maintained .

TOTAL BODY WEIGHT

The total dose of propofol is significantly increased in total body weight group.Heart rate was comparable with lean body weight group.Fall of MAP – starts at 3 min , peak fall at 1min 30 sec and at 3min it started regaining.Target BIS score was achieved and surgical plane was maintained till the inhalational agent was introduced .The parent study was comparing the doses of propofol in Morbidly obese individuals .But my study was done on mixed population , there was no significant difference Limitations :Number of morbidly obese individuals are less so that the effect could not be quantified as the study was done in mixed population .

CONCLUSION

Dosing of propofol for induction based on lean body mass was better when compared to total body weight in attaining surgical plane of anaesthesia using bispectral index .For a lower dose of propofol in LBW group there was no awareness during induction and during intubation.Utilization of BIS monitor prevents drug overdosing .

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