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The different timing of oral clonidine premedication effect on blood pressure in spine surgery

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Abstract

Background: Premedication is the administration of medication before anaesthesia. It is used to prepare the patient for anaesthesia and to provideoptimal conditions for surgery.

Methods: The study of oral premedication dose of clonidine in spinal surgery at different time was conducted on sixty ASA grade-1 patients of either sex between 20 to 60 years of age undergoing elective spine surgery. Thisstudy was performed after approval from ethics committee of the institute. Informed consent was obtained from each patient.

Results: In intergroup comparison in both group-1 and group-2 was comparable throughout the study and the difference was statistically insignificant (p->0.05) up to 50 minute. MAP in group-1 at 60 minute was 75.20 and in group-2 was 70.93 (p≤0.022). MAP at 70 minute was 74.72 in group-1 and 70.72 in group-2 (p≤0.022). MAP at 80 minute in group-1 was 76.11 and in group-2 was 68.39 (p≤0.000) and MAP at 90 minute in group-1 was 76.14 and in group-2 was 67.21(p≤0.000).Thus in intergroup comparison MAP was lower in group-2 which become significant after 60-90 minute of interval.

Conclusion: In conclusion this study establishes that the premedication with tab. clonidine 200µg (As tab. clonidine is available in 100µg) 90 minute before the surgery or 3.5 hour before the surgery stabilized blood pressure response to intubation

Keywords: Clonidine, Blood pressure, SBP, DBP, MAP, Spine

Introduction

Clonidine a centrally acting α-2 `adrenergic agonist is being used as premedication in different doses and at different times with varying result. Clonidine alone can be a very good premedicant as it leads to sedation, haemodynamic stability, decreased intubation response and could lead to decreased analgesic requirement in post-operative period. This drug can pass the blood–brain barrier and reach the central nervous system (CNS), where it can affect the CNS by decreasing the brainsympathetic tone, which would result in a drop in diastolic and systolic blood pressure measurements and also decreased heart rate. Premedication with clonidine

blunts the stress response to surgical stimuli. Narcotic and anaesthetic doses are also reduced. In addition, clonidine increases cardiac baroreceptor reflex sensitivity to increase in systolic blood pressure, and thus stabilizes blood pressure. Clonidine prevents tachycardia and rise in blood pressure in response to laryngoscopy and intubation. The rise in pulse rate and blood pressure after noxious stimuli like laryngoscopy and endotracheal intubation is attributed to the sympatho-adrenal activation.[1-2]

Materials and method

The study of oral premedication dose of clonidine in spinal surgery at different time was conducted on sixty ASA grade-1 patients of either sex between 20 to 60 years of age undergoing elective spine surgery. This study was performed after approval from ethics committee of the institute. Informed consent was obtained from each patient.

Exclusion Criteria-

1. Age<20 and >60
2. Patient refusal
3. ASA-2. ASA-3 and ASA-4
4. Patient with B.P.>140/90and<110/70.H.R<60
5. Patient on any medication which altered H.R. and B.P.
6. Difficult intubation and emergency surgery
7. Any medication which interact with clonidine
8. Cervical spine surgery
9. Coronary artery and cerebrovascular disease
10. Neurological disorder and diabetes mellitus

Study protocol were explained to all the patients during pre- anesthetic evaluation and after taking written informed consent they were included in the study and were allotted the group according to the random allocation software.

Method: Patients were randomized into two groups of 30 each with randomization software.

In group1.patient were received tab clonidine 200µg (2 tablet of Arkamin 100µg each) 90 minute before surgery.

In Group2 patients were received tablet clonidine 200µg 3.5 hour before surgery. (Tablet Arkamin of Urichem Laboratories Ltd.is avaible as 100 µg was used.)

Patients of both the group were advised to take tablet midazolam 7.5mg before bed time and was nil per orally after 10pm.

Next day in the morning group-1 patient were given tab clonidine 200µg 90 minute before surgery and group-2 patient were given tab clonidine 200µg 3.5 hour before surgery. Vitals were recorded in both the groups before premedicating. On arrival in the operation theatre H.R. and

B.P was noted down. Sedation score was done just before and after premedication. The degree of sedation was recorded (as per American society of Anaesthesiology sedation score)

0. Point- patient awake &talkative
1. Point- patient awake but uncommunicative
2. Point-patient drowsy, quiet and easily arousable
3. Point –patient asleep

A peripheral intravenous line was secured with 18G cannula. Monitor was attached and patient base line measurement of HR. SBP. DBP & MAP was obtained non-invasively and ECG was displayed on the monitor. Saturation was monitored throughout the procedure. Injecton fentanyl 2ug/kg i.v and. Injection emset (ondansetron) 4mg 1/v was given and after pre-

oxygenation with 100% oxygen for 3 minute, patient was induced with injection propofol 40 mg stat and 10 mg every 3 second, till eye lash reflex was gone. Induction dose of propofol was noted. After ventilating the patient, injection rocuronium 0.6mg/kg i.v. was given.

Intubation was done gently after 3minute with endotracheal tube 7.5 ID in female and 8.0 ID in the male. Haemodynamics response to intubation was noted. Patient was maintained on oxygen, nitrous Oxide (33%-66%) & isoflurane (0-1%). injection diclofenac 75 mg i/v was given slowly.

Result

The mean systolic blood pressure in group-1 was 103.4350±7.49635. In group-2,the mean systolic blood pressure was100.6283±6.54752.In both the groups systolic blood pressure till 40 min post-intubation was comparable and was statistically insignificant(p>0.05). At 50min SBP in group1was100.10 and in group 2 it was 96.07 (p≤.041). At 60 min it was 99.87 in group1 and 95.07 in group2 (p≤.017).The SBP at70 min was 99.52 in group 1 and 94.07 in group2 (p,≤.007) and at 80 min it was99.44 in group 1 and 92.17 in group2 (p,.≤002) at 90 minute it was 100.14 in group 1 and 91.14 in group2.(p,.≤000) after 90 minute again the SBP in intergroup comparisonwas insignificant(p>0.05)

Table 1: Intergroup comparison of systolic blood pressure between group 1and group 2

Group		N	Mean	Std. Deviation	Std. ErrorMean	Sig
SBP- Before giving the drug	1	30	130.07	9.591	1.751	.458
	2	30	132.13	11.708	2.138	
SBP-After 0' before Intubation	1	30	114.73	11.997	2.190	.769
	2	30	115.63	11.640	2.125	
SBP-After 1' intubation	1	30	119.77	23.641	4.316	.669
	2	30	117.50	16.544	3.021	
SBP-After 3' intubation	1	30	106.80	14.272	2.606	.958
	2	30	106.60	15.062	2.750	
SBP-After 5' intubation	1	30	102.77	13.513	2.467	.376
	2	30	99.67	13.417	2.45o	
SBP-After 10' intubation	1	30	102.13	10.071	1.839	.281
	2	30	99.23	10.585	1.933	
SBP-After 20' intubation	1	30	99.90	9.264	1.691	.136
	2	30	96.23	9.536	1.741	
SBP-After 30' intubation	1	30	100.57	11.767	2.148	.910
	2	30	100.27	8.550	1.561	
SBP-After 40' intubation	1	30	100.53	8.613	1.573	.076
	2	30	96.87	7.040	1.285	

SBP-After 50' intubation	1	30	100.10	8.087	1.477	.041
	2	30	96.07	6.817	1.245	
SBP-After 60' intubation	1	30	99.87	8.119	1.482	.017
	2	30	95.07	6.943	1.268	
SBP-After 70' intubation	1	29	99.52	7.994	1.484	.007
	2	29	94.07	6.771	1.257	
SBP-After 80' intubation	1	27	99.44	7.728	1.487	.002
	2	23	92.17	7.626	1.590	
SBP-After 90' intubation	1	22	100.14	5.488	1.170	.000
	2	14	91.14	6.871	1.836	
SBP-After 100' intubation	1	4	98.50	5.745	2.872	.642
	2	3	96.67	3.055	1.764	
SBP-After 110' intubation	1	3	98.67	5.033	2.906	.274
	2	1	90.00	5.448	1.902	

Diastolic blood pressure was recorded as same way in both the group. In group-1, the average diastolic blood pressure before oral premedication of tab clonidine was 83.80±6.795. DBP at 0 minute, before intubation was 72.27±9.948, DBP after 1 minute of intubation was 75.47±14.708 and DBP after 3 minute of intubation was 67.83±14.133. After premedication of the patient almost the end of surgery the mean diastolic blood pressure was 65.73±6.028 which is highly significant($p<0.001$) in intragroup comparison.

In group-2, average Diastolic blood pressure before giving the drug was 82.37±10.233.DBP at 0 minute before the intubation was 74.67±9.582.DBP after 1 minute of intubation was71.87±11.818. DBP after 3 minute of intubation was 62.47±12.170. And after giving the drug till the end of surgery the average diastolic blood pressure was 62.77±5.853 which is also highly significant($p<0.001$). Mean diastolic blood pressure in group-1 was 65.7633±6.0960. In group-2 mean diastolic blood pressure was 62.7833±5.8163. In both the groups change in DBP was statistically insignificant($p>0.05$).The mean DBP in group was 63.87 in group-1 at 60 minute and 59.27 in group-2($p\leq0.024$).It was 64.41 at 70 minute in group-1 and 58.55 in group-2 ($p\leq.004$). DBP was 64.85 in group-1 and 56.70 in group-2 at 80 minute ($p\leq.00$) and it was 64.45 in group-1 and 55.29 in group-2 at 90 minute ($p\leq0.001$).Thus in intergroup comparison the DBP was lower in group- 2,it was significant after 50-90 minute of interval.

Table 2:Intergroup comparison of diastolic blood pressure atdifferent time intervals

Group		N	Mean	Std. Deviation	Std. Error Mean	Sig.
DBP- Before giving the drug	1	30	83.80	6.795	1.241	.525
	2	30	82.37	10.233	1.868	
DBP-After 0' before intubation	1	30	72.27	9.948	1.816	.345
	2	30	74.67	9.582	1.749	
DBP-After 1' intubation	1	30	75.47	14.708	2.685	.302
	2	30	71.87	11.918	2.176	
DBP-After 3' intubation	1	30	67.83	14.133	2.580	.120
	2	30	62.47	12.170	2.222	
DBP-After 5' intubation	1	30	65.33	12.680	2.315	.234
	2	30	61.80	9.915	1.810	
DBP-After 10' intubation	1	30	65.27	7.887	1.440	.118
	2	30	61.77	9.145	1.670	
DBP-After 20' intubation	1	30	63.40	6.631	1.211	.551
	2	30	62.00	10.913	1.993	
DBP-After 30' intubation	1	30	63.67	9.223	1.684	.967
	2	30	63.57	9.298	1.698	
DBP-After 40' intubation	1	30	62.93	6.762	1.234	.402
	2	30	61.33	7.867	1.436	
DBP-After 50' intubation	1	30	63.70	6.969	1.272	.176
	2	30	61.07	7.891	1.441	
DBP-After 60' intubation	1	30	63.87	7.314	1.335	.024
	2	30	59.27	8.043	1.468	
DBP-After 70' intubation	1	29	64.41	7.356	1.366	.004
	2	29	58.55	7.707	1.431	
DBP-After 80' intubation	1	27	64.85	7.946	1.529	.001
	2	23	56.70	8.369	1.745	
DBP-After 90' intubation	1	22	64.45	7.269	1.550	.001
	2	14	55.29	6.999	1.871	
DBP-After 100'	1	4	64.00	8.794	4.397	.760

intubation	2	3	62.00	6.928	4.000	
DBP-After 110'intubation	1	3	59.33	6.429	3.712	.754
	2	1	62.00	6.928.	4.000.	.

Mean arterial pressure in group-1, before premedication was 98.83±7.073. MAP at 0 minute before intubation was 87.17±10.185. MAP at 1 minute after intubation was 91.40±16.183 and MAP after 3 minute of intubation was 82.87±13.743. After premedication of the patient almost the end of surgery, the mean arterial blood pressure was78.53±6.263 which is highly significant (p<0.001). In group-2, mean arterial blood pressure before premedication was 97.17±12.771mmHg. MAP at 0 minute before intubation was 86.67±9.939. MAP after 1 minute of intubation was 87.67±11.247 and MAP after 3 minute of intubation was 78.53±10.679. After premedication till end of surgery, mean arterial blood pressure was 75.73±5.807 which is highly significant (P-<0.001) and no Haemodynamic response to MAP was seen after intubation. In intergroup comparison in both group-1 and group-2 was comparable throughout the study and the difference was statistically insignificant (p->0.05) up to 50 minute. MAP in group-1 at 60 minute was 75.20 and in group-2 was 70.93 (p≤0.022). MAP at 70 minute was 74.72 in group-1 and 70.72 in group-2 (p≤0.022). MAP at 80 minute in group-1 was 76.11 and in group-2 was 68.39 (p≤0.000) and MAP at 90 minute in group-1 was 76.14 and in group-2 was 67.21(p≤0.000).Thus in intergroup comparison MAP was lower in group-2 which become significant after 60-90 minute of interval

Table 3: Intergroup comparison of MAP at different time intervals

Group		N	Mean	Std. Deviation	Std. ErrorMean	Sig.
MAP- Before giving the drug	1	30	98.83	7.037	1.285	.542
	2	29	97.17	12.997	2.414	
MAP-After 0' before intubation	1	30	87.17	10.185	1.859	.848
	2	30	86.67	9.939	1.815	
MAP-After 1' intubation	1	30	91.40	16.183	2.955	.304
	2	30	87.67	11.247	2.053	
MAP-After 3' intubation	1	30	82.87	13.743	2.509	.178
	2	30	78.53	10.679	1.950	
MAP-After 5' intubation	1	30	79.40	12.350	2.255	.337
	2	30	76.57	10.194	1.861	
MAP-After 10' intubation	1	30	78.50	8.063	1.472	.139
	2	30	75.17	9.128	1.666	
MAP-After 20'	1	30	76.37	7.453	1.361	.139
		30	73.43	7.709	1.407	

intubation	2					
MAP-After 30'	1	30	75.50	10.556	1.927	.492
intubation	2	30	77.20	8.364	1.527	
MAP-After 40'	1	30	74.90	7.439	1.358	.324
intubation	2	30	73.00	7.367	1.345	
MAP-After 50'	1	30	74.97	7.285	1.330	.215
intubation	2	30	72.60	7.328	1.338	
MAP-After 60'	1	30	75.20	7.179	1.311	.022
intubation	2	30	70.93	6.883	1.257	
MAP-After 70’	1	29	74.72	6.902	1.282	.022
intubation	2	29	70.72	6.041	1.122	
MAP-After 80'	1	27	76.11	7.084	1.363	.000
intubation	2	23	68.39	7.347	1.532	
MAP-After 90'	1	22	76.14	6.476	1.381	.000
intubation	2	14	67.21	6.423	1.717	
MAP-After 100'	1	4	75.50	6.557	3.279	.839
intubation	2	3	76.33	.577	.333	
MAP-After 110'	1	3	72.00	2.000	1.155	.049
intubation	2	1	82.00	12.623.	2.314	.

Discussion

In both the groups of the study the mean systolic blood pressure decreased significantly from the baseline value. In group-1, the average systolic blood pressure decreased from 130.07±9.591 to 103.47±7.528. The mean SBP before the intubation at 0 minute was 114.73±11.997.The mean SBP after 1minute of intubation was 119.77±23.641 and after 3 minute of intubation was 106.80±14.272.

Similarly in group-2, the average systolic blood pressure decreased from 132.13±11.708 to 100.67±6.488.The SBP before the intubation at 0 minute was 115.63±11.640. The SBP after 1 minute of intubation was 117.50±16.544 and after 3 minute of intubation was 106.60±15.062.The average systolic blood pressure after tab.clonidine premedication to tillthe end of surgery was100.67±6.488 which is highly significant as compared to baseline value ($p \leq 0.001$). In both the groups of the present study, the systolic blood pressure decrease significantly from the baseline value, but in intergroup comparison this difference was insignificant ($P \geq 0.05$.)

Study of the M.M. Chandrashekaralash. M. Upadya et.al[3] in their study of effect of clonidine premedication on Haemodynamic change during laproscopic cholecystectomy are similar to our study.in which they used tab.clonidine premedication 150µg 1 hour before the induction of anaesthesia.In their study SBP fall to

22% of the baseline value that is similar to our study in which SBP fall to12% in group-1 and 13% in group-2 from the baseline value to pre-induction. DBP fall to12% and MAP fall to 14% from the baseline value to before the pre-induction was similar to our study in which DBP decreased 14% in group-1 and 10 % in group-2 from the average baseline value to pre-induction. MAP decreased in our study was 12% from baseline value to before induction in group- 1and 11% in group-2.

Conclusion

In conclusion this study establishes that the premedication with tab. clonidine 200µg (As tab. clonidine is available in 100µg) 90 minute before the surgery or 3.5 hour before the surgery stabilized blood pressure response to intubation.

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