

The different timing of oral clonidine premedication effect on heart rate 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 provide optimal 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. This study was performed after approval from ethics committee of the institute. Informed consent was obtained from each patient.

Results: Mean heart rate in group-1, was 76.9680 ± 8.23639 and in group-2 was 82.860 ± 11.79126 . This difference was statistically insignificant in both the group ($p \geq 0.05$). There was significant increase in HR in group-2 as compared to group-1 from 50-80 minute post-intubation. HR increased till the 5 minute post intubation in both the groups. Then at 10 minute it came to mean base line value. Although this increase was only moderate 5% but this was significant in intergroup comparison.

Conclusion: It shows that premedication with tab. Clonidine $200\mu\text{g}$ before 90 minute and 3.5 hour of surgery attenuated haemodynamic response to intubation.

Keywords: Clonidine, Heart rate, 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 brain sympathetic 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. >140/90 and <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 group 1, patients were received tab clonidine 200µg (2 tablet of Arkamin 100µg each) 90 minute before surgery.

In Group 2 patients were received tablet clonidine 200µg 3.5 hour before surgery. (Tablet Arkamin of Urichem Laboratories Ltd. is available 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. Injection fentanyl 2µg/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.

Results

Average HR in group-1 before premedication was 79.40±7.916. Average HR at 0 minute before intubation was 73.40±11.933. Average HR after 1 minute of intubation was 84.80±14.34 and after 3 minute of intubation was 81.20±11.29.

In group-2 average heart rate before premedication was 83.07±8.863. HR after 0 minute before the intubation was 78.17±10681. Average HR after 1 minute of intubation was 87.10±13.540 and average HR after 3 minute of intubation was 85.07±12.684. After premedication till the end of surgery HR was 82.87±11.738.

In both the group HR increased modestly from baseline value. Average increase in HR in both the group was about 5%.This value in both the groups is statistically insignificant (P-≥0.05). Mean heart rate in group-1, was 76.9680±8.23639 and in group-2 was 82.860±11.79126.This difference was statistically insignificant in both the group (p-≥0.05).There was significant increase in HR in group- 2 as compared to group-1 from 50-80 minute post-intubation.HR increased till the 5 minute post intubation in both the groups. Than at 10 minute it came to mean base line value. Although this increase was only moderate 5% but this was significant in intergroup comparison.

From the above result in both the groups, it shows that premedication with tab. Clonidine 200µg before 90 minute and3.5 hour of surgery attenuated haemodynamic response to intubation.

Table 1: Comparison of intraoperative heart rate between group 1 and group 2

Group	N	Mean	Std. Deviation	Std. Error Mean	Sig.
HR- Before giving the 1drug	30	79.40	7.916	1.445	.096
2	30	83.07	8.863	1.618	
HR-After 0' before 1	30	73.40	11.933	2.179	.108
intubation 2	30	78.17	10.681	1.950	
HR-After 1' intubation 1	30	84.80	14.346	2.619	.526
2	30	87.10	13.540	2.472	
HR-After 3' intubation 1	30	81.20	11.297	2.062	.217
2	30	85.07	12.684	2.316	
HR-After 5' intubation 1	30	79.50	11.215	2.048	.245

2		30	83.17	12.890	2.353	
HR-After 10'	1	30	77.53	10.281	1.877	.169
intubation	2	30	81.67	12.595	2.300	
HR-After 20'	1	30	75.43	10.500	1.917	.120
intubation	2	30	80.27	13.067	2.386	
HR-After 30'	1	30	74.90	9.714	1.774	.190
intubation	2	30	78.97	13.725	2.506	
HR-After 40'	1	30	75.80	8.475	1.547	.053
intubation	2	30	81.70	14.013	2.558	
HR-After 50'	1	30	76.43	9.302	1.698	.029
intubation	2	30	83.23	13.811	2.521	
HR-After 60'	1	30	76.67	8.001	1.461	.017
intubation	2	30	83.73	13.615	2.486	
HR-After 70'	1	29	74.90	8.600	1.597	.003
intubation	2	29	84.62	14.804	2.749	
HR-After 80'	1	27	74.85	8.565	1.648	.001
intubation	2	23	86.00	14.435	3.010	
HR-After 90'	1	22	76.14	9.403	2.005	.151
intubation	2	14	82.36	16.046	4.289	
HR-After 100'	1	4	73.00	13.904	6.952	.970
intubation	2	3	73.33	3.055	1.764	
HR-After 110'	1	3	74.67	16.653	9.615	.808
intubation	2	1	80.00	13.011.	2.121.	

Discussion

Average HR in group-1 before premedication was 79.40 ± 7.916 . Average HR at 0 minute before intubation was 73.40 ± 11.933 . Average HR after 1 minute of intubation was 84.80 ± 14.34 and after 3 minute of intubation was 81.20 ± 11.29 .

In group-2 average heart rate before premedication was 83.07 ± 8.863 . HR after 0 minute before the intubation was 78.17 ± 10.681 . Average HR after 1 minute of intubation was 87.10 ± 13.540 and average HR after 3

minute of intubation was 85.07 ± 12.684 . After premedication till the end of surgery HR was 82.87 ± 11.738 .

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Dr. Dipak L.Raval et.al on Oral clonidine premedication for attenuation for haemodynamic response to laryngoscopy and intubation in which clonidine group received tab.clonidine 4µg/kg or max.0.2mg 90 minute prior to induction of anaesthesia.HR decrease to 11% from baseline value in their study at the time of induction in clonidine group same as in our study group in which HR decreased 9% from baseline value at time of induction. There was 4% increased HR from baseline value after 3 minute of intubation as in compare to our study in which HR increased 9% from baseline value 3 minute after intubation

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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