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EXAMINATION OF THE RESPONSE TO A α-2 RECEPTOR AGONIST UTILIZED AS ANESTHETIC FOR THE PATIENTS USING α-1 BLOCKERS

[1]Dr Ghanwa Muzammil, [2] Dr. Memoona Naeem
[1]Lahore General Hospital Lahore
[2]Independent Medical College, Faisalabad

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Abstract:
Objective: *The aim of this research work is to check the response to a α-2 receptor agonist utilized as an anesthetic for the patients undergoing prostrate surgery utilizing α1 blockers from a long duration.*
Methodology: *60 patients who were undergoing TURP (Trans-urethral Resection Prostate) or holmium laser prostate resection under the impact of SA (Spinal Anesthesia) separated into 2 groups; Group-N (35), which were not receiving α-1 blockers and Group-T (25), managed Tamsulosin for minimum one month prior to research work. We obtained the scores of bi-spectral indexes, scores of modified observer's evaluation of sedation scale, HR (Heart Rate) and average BP under anesthesia utilizing dexmedetomidine for thirty minutes in the duration of the surgery.*
Results: *Only one disparity discovered between groups was average BP fifteen minutes after the 1st dose of the dexmedetomidine through injection. We noted the disparities between the subjects of both groups at fifteen minute (Group-T: 98.20 ± 10.90 and Group-N: 88 ± 15.50 mmHg), twenty minute (Group-T: 97.80 ± 10.30 and Group-N: 85.40 ± 13 mmHg), at twenty-five minute (Group-T: 97.30 ± 11.40 and Group-N: 83.40 ± 11.80 mmHg) and at thirty minute (Group-T: 96.80 ± 11.10 and Group-N: 82.50 ± 11.50 mmHg).*
Conclusions: *The utilization of the α-2 receptors is suitable during operation of the patients suffering from benign hyperplasia of prostate with the use of Tamsulosin, and findings showed no requirement to change the dose. Attentiveness with anesthesia including α-2 receptors maintained for the subjects utilizing Tamsulosin from long duration and the patients who never used Tamsulosin.*
KEYWORD: *Tamsulosin, Anesthesia, Hyperplasia, Hypotension, Receptor. Dexmedetomidine, Prostate.*

Corresponding author:
Dr. Ghanwa Muzammil,
Lahore General Hospital Lahore

QR code

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INTRODUCTION:

The α-1 blockers are very frequently in use for the medical treatment of the obstruction of the urinary tract in the patients suffering from BHP (Benign Hyperplasia of Prostate); but they have some side effects like dizziness, hypotension and fatigue [1]. The comparison of the efficacy of these medicines with placebo is the subject of research works [2-6]. Phenoxybenzamine is present with very high similarity for α-2 adrenoceptors which was present in the neuroeffector cleft of prostate [7, 8]. The 1st available α-1 adrenoceptor blocker is the Tamsulosin [9]. It is highly discerning for α-1 adrenoceptors in prostate of human beings as compared to the aorta of human [1]. Patients present with the symptoms of BHP, Tamsulosin has the ability mitigate these signs and promotes the flow of blood and dissimilar from terazosin and doxazosin, there was not significant impact on BP [9].

BHP is very frequent condition having impact on men greater than forty-five year of age [10], 78.0% men will develop symptoms of BHP by age of eighty years and there is an estimation that 88.0% men having age of 80-89 display evidence of disease through histology [9, 11, 12]. Generally, there is expectation of high occurrence of the intra-surgery and postsurgical complication and high rate of mortality in elder patients [13]. Hong [14] stated that utilization of DMT (dexmedetomidine) needed longer stay in post-anesthetic care unit as compared to the group of controls. DMT has the ability to reduce anesthetic and opioid needs and it is reason of sedation and analgesia [15]. The α-1 adrenoceptors which have contributions in motor activities, are present in many brain regions [16]. Amazingly, there are considerable condensed concentrations of α-2 and α-1 adrenoceptors in the region of the locus coeruleus [17, 18]. Virtanen [19] stated that central activities of α-1 and α-2 adrenoceptor were observable at greater dose of the DMT. Central α-1 and α-2 adrenoceptor of various regions of brain have contrasting behavioral activity in which one restricting the activity and other stimulating it [20].

METHODOLOGY:

Total 60 patients from 45 to 80 years of age with ASA-PS 1and 2 who were undergoing HoLEP and trans-urethral resection of prostate under SA and sedation utilizing DMT were the part of one group; Group-N (with no medication) and Group-T (using Tamsulosin). Patients having BMI of more than 31.0 kg/m2 or suffering from any other mental illness were not the part of this research work. We noted the variables of hemodynamics with the utilization of the non-invasive calculation of the MBP (Mean Blood Pressure, HR, saturation of O2, ECG findings and temperature. Intravenously management of the ten mL/kg crystalloid carried out for hydration. Anesthesia procedure were according to the standard international methods.

Operation of the pump of the syringe carried out by anesthetist who was not the part of this research and scores of BIS (Bi-spectral Index) {Table-1(a)} and scores of MOAA/S (Modified Observer's Assessment of Alertness Sedation Scale) recorded five minutes after the management of the DMT [22]. Because the measurement of the scale of MOAA/S can have impact on the scores of BIS, the measurement of the scores of BIS carried out in early stage. If the scores on MOAA/S scale were five, four or three, patients were conscious; patients were unconscious if scores were less than 3 {Table-1(b)}. Table-1(a) displays a scales which provides association of the score of BIS with the degree of sedation [23]. The BIS score from 80-89 were BIS-80, we measured the time of drug loading in seconds. BIS-70 and BIS-60 measured in similar manner. The duration to reach BIS-60, BIS-70 and BIS-80 for every group compared with each other. The comparison of the BIS-60, BIS-70 and BIS-80 carried out in both groups. The use of alpha-1 blockers for long durations would have no impact on the rate of sedation among both groups. So we set the effective size as 0.50 [24]. SPSS V.18 was in use for the statistical analysis of the collected information. T test was in use for the comparison of the quantitative variables discovered in two groups. Numbers and average values were available to express all the information.

Table 1: BIS range (a), Responsiveness scores of the Modified Observer's Assessment of Alertness/Sedation (MOAA/S) Scale (b)

(a)	**BIS**	**Sedation degree**
	90 to 100	Awaken
	70 to 89	Light to moderate sedation
	60 to 69	Superficial anesthesia
	45 to 59	Adequate anesthesia
	0 to 45	Deep anesthesia
(b)	**Score**	**Response**
	5	Responds readily to name spoken in normal tone
	4	Lethargic response to name spoken in normal tone
	3	Responds only after name is called loudly or repeatedly
	2	Responds only after mild prodding or shaking
	1	Does not respond to mild prodding or shaking
	0	Does not respond to noxious stimulus

RESULTS:

The enrollment of 71 patients carried out into 2 groups. The exclusion of 8 patients from Group-T and 3 patients from Group-N carried out because improper SA. So, 60 patients remained the part of this research work (Group-T =25; Group-N=35). The information about demography as well as perioperative data and total duration of the utilization of Tamsulosin are present in Table-2.

Table 2a : Demographic data and patient characteristics

Characteristics	Group N (n = 35)		Group T (n = 25)		p-value
	Mean	± SD	Mean	± SD	
Age (yr.)	63.30	8.20	65.50	7.30	0.2530
Height (cm)	168.40	7.40	167.60	4.60	0.5410
Weight (kg)	69.50	10.30	68.50	6.80	0.6250
Duration of Tamsulosin use	0.00	0.00	30.30	28.50	Not Sig

Table 2b: Type of Operation

TURP	15.0	6.0	Not Sig
HoLEP	22.0	26.0	Not Sig
ASA class I	7.0	6.0	Not Sig
ASA class II	30.0	26.0	Not Sig

We examined no important disparities between the patients of both groups about age, gender, weight, height classification of ASA and surgery type. Statistically significant disparity about the scores of BIS was not present in both groups from the start of the usage to thirty minutes later {Figure-1 (a)}. The periods of time needed to achieve the BIS-80, BIS-70 and BIS-60 were also not significant (Table-3). We also found no statistically significant disparity between 2 groups about the scale of MOAA/S calculated from start to thirty minutes later {Figure-2 (b)}. Additionally, there were no statistically important disparities between the outcomes of the heat rates and 7 calculations of the results from start of utilization to thirty minutes later {Figure-2 (c)}. But the MBP of the Group-T was greater than Group-N at fifteen minutes (Group-T: 100.20 ± 12.90 mmHg and Group-N: 90 ± 17.50 mmHg), twenty minutes (Group-T: 99.80 ± 12.30 and Group-N: 87.40 ± 15 mmHg), twenty-five minutes (Group-T: 99.30 ± 13.40 and Group-N: 85.40 ± 13.80 mmHg) and thirty minutes (Group-T: 98.80 ± 13.10 and Group-N: 84.50 ± 13.50 mmHg) {Figuure-2 (d)}.

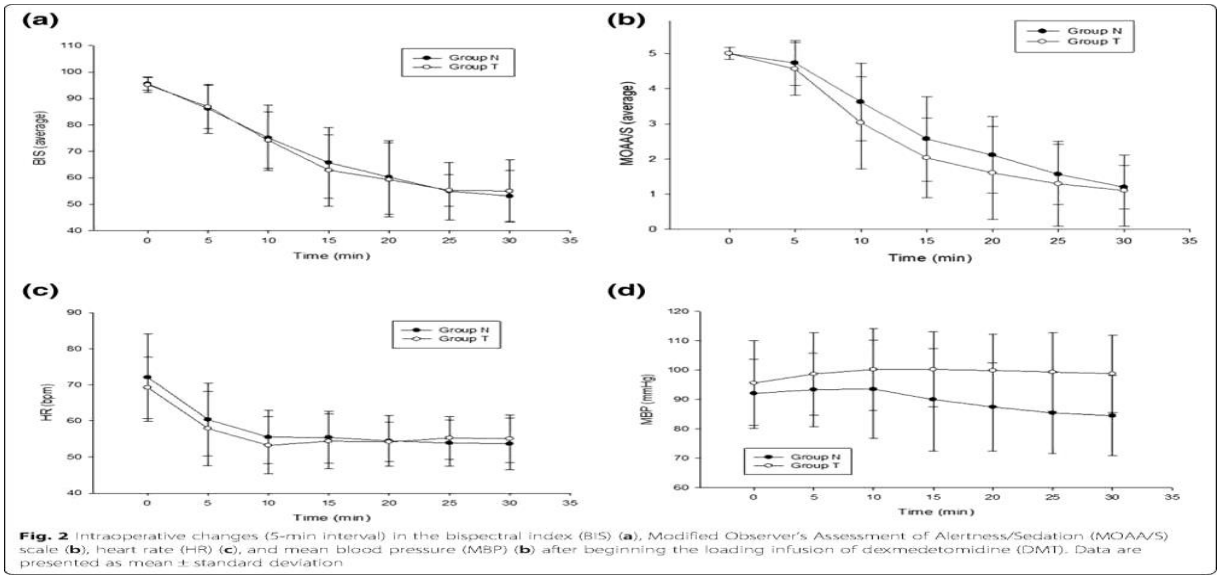

Fig. 2 Intraoperative changes (5-min interval) in the bispectral index (BIS) (**a**), Modified Observer's Assessment of Alertness/Sedation (MOAA/S) scale (**b**), heart rate (HR) (**c**), and mean blood pressure (MBP) (**b**) after beginning the loading infusion of dexmedetomidine (DMT). Data are presented as mean ± standard deviation

Figure 2 (a), (b), (c), and (d)

Table 3: BIS_{80}, BIS_{70}, and BIS_{60}

Variables	Group N (n = 37)		Group T (n = 32)		p-value
	Mean	± SD	Mean	± SD	
BIS80	2933.40	1703.00	2333.00	156.00	0.1330
BIS70	483.40	270.60	503.70	294.70	0.7670
BIS60	720.40	3533.00	655.40	90.70	0.4110

DISCUSSION:

Utilization of α-1 blockers is very common treatment for the patients of BHP. Additionally, the development of α-1 blockers with enhanced selectivity discovered in a consequence of the hard work of many specialists to decrease the side effects. Usage of DMT in surgery room is not common not only as additional agent for the subjects under GA (General Anesthesia) but also as light sedative medicine for the patients under SA. The findings of this research work also stated that usage of α-1 blocker for thirty days has no impact on the use of the α-2 agonists. This does not show that usage of the α-1 blockers can change the α-2 receptors in the brain as presented by any other research works [17-20]. BIS scores from 45-60 are the appropriate to prevent recall in GA [23]. Some current research works have displayed that a BIS-guided manual management compared to a weight-associated manual management would decrease the prevalence of the hypotension in the induction of the GA [25]. Hypotension is the frequent side effects of the DMT [26]. When use of DMT carried out with SA, it is possibility of increase in the amount of side effects. But in this current research work, we found no patient to with the requirement of rescue medicines from hypotension. Our findings of this research work showed that heart rate measurement is not able to show any important disparity in the patients of both group; however, they showed an important disparity in mean blood pressure after fifteen minutes. There are some limitations of this research work as limit of the age with patients appeared after forty five year of age [10]. The proportion of the patients in every group was very less. Other limitation was that we did not follow up the patients to note the total time of recovery.

CONCLUSION:

Utilization of the α-2 agonists is suitable in the duration of surgery for the patients of BHP who are using Tamsulosin from long duration.

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