IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 17, Issue 01 Ver. VI January. (2018), PP 07-10
www.iosrjournals.org

A Study of Recovery Profile After Subarachnoid Block in Elderly Versus Young Patients

Dr.Virendra Modi[1]Dr.Dattatraya Gangurde[2]
[1]*Assistant Professor, Dept of anaesthesiology, Govt Medical College, Akola*
[2]*Assistant Professor, Dept of anaesthesiology, Govt Medical College and Cancer Hospital, Aurangabad*
Corresponding Author: Dr.Virendra Modi

Abstract
Aim: *To compare the recovery profile after subarchnoid block in elderly and young patients and to investigate new discharge criteria to decrease recovery room time without jeopardizing patient safety.*
Method: *After approval from ethical committee 100 patients are divided into two groups, group I (young) consist of age group between 20-40 years and group II (elderly) with age more than 60 years. All these patients preoperative pulse rate and MAP recording done and in recovery room at 0,30, 60 and 90 min pin prick test, toe movement and changes in pulse rate and mean arterial pressure (MAP) 2 minutes following orthostatic challenge and statistical analysis done.*
Result: *When statistical analysis done between two groups mean age in group I was 32.42 ±3.44 years and group II was 66.40 ±3.91 years and there difference between maximum height of sensory blockade in group I i.e. T 7.82 ±1.10 compare to group II patients i.e. T 7.34 ±1.17 ($p<0.05$) which was statistically significant. The mean preoperative pulse rate and MAP in group I was 87.12±7.17 and 90 ±5.17 and in group II was 84.92±5.91and 91.2±5.42 respectively, but after orthostatic challenge test the mean pulse rate change was 7.08% at 0 min, 1.99% at 30min, 1.7% at 60min and 0.77% at 90 min in group I and in group II was 9.46% at 0min, 7.09% at 30 min, 5.89% at 60min and 2.73% at 90min. Also mean fall in MAP Less than 10% after orthostatic challenge test.*
Conclusion: *From present study we concluded that in elderly patients level of anaesthesia higher than young patients and recovery of sensory, motor and autonomic function will be slower and new discharge criteria can be safely applied to elderly population and it will save significant time and resources of recovery room without jeopardising patients safety.*
Keywords: *Recovery profile, elderly, new discharge criteria, orthostatic challenge test.*

Date of Submission: 23 -12-2017 Date of acceptance: 06-01-2018

I. Introduction

The spinal anaesthesia has the potential for being a uniquely safe anaesthesia technique due to combination of profound analgesia, muscle relaxation and less systemic and metabolic disturbances compare to general anaesthesia[1].But despite of this advantages anaesthesiologist continue to face confusion about balancing risk and benefits of spinal anaesthesia. The number of elderlyperson undergoing surgery in India is increasing owing to increase in life expectancy[2], but because of concomitant age related disease and basic decline in organ function they are at greater risk during anaesthesia and surgery[3].

The empirical discharge criteria from recovery room include regression of sensory level to two dermatomes and return of motor function to lower extremity (assessed by toe movement)[4], but this does not guarantee about return of autonomic function and also increase cost of recovery room stay of patient, so new discharge criteria introduce which are based on checking return of autonomic function by subjecting the patients to orthostatic challenge in recovery room.[5] It has already proven that there is no correlation between orthostatic decrease in MAP and the concurrent level of sensory anaesthesia[4], and it is safe from haemodynamic point of view to discharge patients from recovery room after they meet orthostatic criteria[4,5].

We aimed to investigate the new discharge criteria and whether it is valid to elderly Indian population and as well as is there any differencein recovery profile between elderly and young population with special reference to orthostatic challenge test.

II. Aims And Objectives

1) To study recovery profile and subarachnoid block in elderly and young patients.
2) To study differences in orthostatic pulse and blood pressure changes in recovery room in elderly and young patients.

3) To investigate new discharge criteria to decrease recovery room time without jeopardizing patient safety.

III. Materials And Methods

The present study was undertaken in department of anaesthesiology. After approval from hospital ethical committee written informed consent obtained from selected 100 patient of ASA grade I and grade II of either sex posted for elective surgery. Depend upon age criteria these 100 patients divided into two groups of which group I contain 50 patients and group II contain 50 patients. Both of these groups does not contains patients contradiction for spinal anaesthesia, having any respiratory and cardiovascular disease and also peripheral and autonomic neuropathies.

Group I – Comprised of young patients of 20-40 years age.

Group II – Comprised of elderly patients of more than 60 years of age.

All patients underwent through preoperative evaluation and adequately fasted day before surgery as per guideline i.e. 8 hours for solid and 3 hours for clear fluid.

After establishing intravenous assess in preoperative room, Ringers lactate was started and baseline values of heart rate, systolic and diastolic blood pressure were recorded. Under all aseptic precaution with patient in left lateral position, a 23 gauge Quincke's spinal needle was introduced in midline at L3-L4 interspace. After ensuring free flow of cerebrospinal fluid, 3 ml of 0.5% hyperbaric bupivacaine was injected intrathecally and the patients were quickly returned to supine position. With Schiller'sDefiguard 5000 moniter, non-invasive blood pressure (MAP), pulse rate, Spo2 and electrocardiogram monitoring continued.

Intraoperatively fluid was given as per calculation for maintenance and losses. Blood pressure was maintained +20% of baseline value with the help of mephentermine 6mg boluses as well as increasing rate of intravenous fluid administered. Total amount of vasopressor and fluid given in operating room, highest level of sensory anaesthesia developed (pin prick) and total duration spent in operating room were recorded.

On coming to recovery room at 0, 30, 60 and 90 minutes postoperatively the following observations were made.

1.Highest level of sensory block (pin prick).

2.Presence of observable toe movement. 3.Change in pulse rate and mean arterial pressure (MAP) 2 minutes following orthostatic challenge.

In orthostatic challenge patients were tilted by raising head end of tilting table up by greater than 60^0. If patients complained of dizziness and chest pain while been tilted they were immediately returned to supine position. All observation were analysed for statistical significance using paired T test, Two sample T test or z test. P value < 0.05 was consider as statistically significant.

IV. Results

In present study, 100 patients were selected and divided into two group i.e. Group I (n=50) and Group II (n=50) depend upon age criteria. When statistical analysis done between two groups mean age in group I was 32.42 $\pm$3.44 years and group II was 66.40 $\pm$3.91 years and both groups were comparable with respect to demographic parameter other than age like gender, height, weight, and ASA status wise.

Mean duration of operation performed in group I patients were 77.6 $\pm$15.5 minute and in group II patients were 81.0$\pm$ 14.6 minute ($p>0.05$) which was statistically not significant. The mean preoperative pulse rate in group I and group II was 87.12 $\pm$7.17 per minute and 84.92 $\pm$ 14.6 per minute respectively ($p>0.05$). The mean MAP in group I patients was 90.0 $\pm$5.17 mmHg while in group II patients it was 91.2 $\pm$5.45 mmHg ($p>0.05$). There was no statistical significant difference in two groups with respect to mean pulse rate and mean MAP.

The difference between maximum height of sensory blockade in group I i.e. T 7.82 $\pm$1.10 compare to group II patients i.e. T 7.34 $\pm$1.17 ($p<0.05$) which was statistically significant. Intraoperative average fluid required (including preloading) in both groups were comparable i.e. in group I it was 1201 $\pm$141 ml and while in group II was 1225 $\pm$155 ml ($p>0.05$) .

Intraoperatively hypotension was noted in 11 (22%) patients of group I and 17 (34%) patients in group II. In group I ,2 (18.2%) of these 11 patients and in group II,6(81.8%) of 17 patients required mephentermine and also average dose of mephentermine required for group I 6mg compared to group II were 8mg. From these it was inference that hypotension and average dose requirement of mephentermine to treat hypotension was significantaly higher in elderly i.e. group II patients compare to young .i.e. group I patients.

Table No. 1 : Table showing sensory level regression in recovery room in both groups

Time in min	Group I		Group II		p value
	Mean sensory level	Sensory level regression	Mean sensory level	Sensory level regression	
0	T10.04 ±0.90	2.22	T9.48 ±1.01	2.14	<0.005
30	T11.86±1.05	4.04	T11.02 ±1.06	3.68	<0.001
60	L1.76 ±1.08	5.94	T12.58 ±1.07	5.24	<0.001
90	L4 ±0.81	8.18	L2.76 ±1.08	7.42	<0.001

From table no. 1 it was found that sensory level slightly higher in group II (elderly) and the difference was statistically significant at 0min and highly significant at 30, 60 and 90 min in recovery room.

Table No. 2 : Table showing motor regression (in form of toe movements) in recovery room in both groups

Time in RR (min)	Group I	Group II
0	0	0
30	0	0
60	0	0
90	5	1

Table no.2 showing motor regression was absent in both groups in 0, 30 and 60 min in recovery room, but at 90 min 5 patients in group I and 1 patient in group II had motor recovery in the form of toe movement.

Table No.3 : Table showing pulse rate variation after orthostatic challenge in recovery room in two groups.

Group	Time (min)	Before Orthostatic challenge	After Orthostatic challenge	% change	p value
Group I	0	79.64±4.10	85.28±4.37	7.08%	<0.001HS
	30	79.42±4.18	81.00±4.31	1.99%	>0.05NS
	60	78.98±4.60	80.32±4.32	1.70%	>0.05NS
	90	80.36±4.10	80.98±4.00	0.77%	>0.05NS
Group II	0	77.60±3.84	84.94±4.10	9.46%	<0.001HS
	30	78.72±4.06	84.30±4.07	7.09%	<0.001HS
	60	80.42±3.82	85.16±3.72	5.89%	<0.001HS
	90	80.44±3.90	82.64±3.96	2.73%	<0.001HS

HS-Highly Significant NS –Not Significant

The statistical data from table no.3 it was observed that in group I patientsstatistically significant increase in mean pulse rate after giving orthostatic challenge at 0 min postoperatively, while mean pulse rate changes after orthostatic challenge were not statistically significant at 30, 60 and 90 min postoperatively.
Also statistically significant increase in mean pulse rate in group II patients after orthostatic challenge was observed at 0, 30, 60 and 90 min postoperatively in recovery room.

Table No.4 : Table showing mean arterial pressure changes in recovery room after orthostatic challenge in both groups

Group	Time (min)	Before Orthostatic challenge	After Orthostatic challenge	% change	P value
Group I	0	87.34±3.58	82.40±4.00	5.66%	<0.001
	30	87.32±3.76	86.36±3.69	1.08%	>0.05
	60	89.40±3.48	88.68±3.72	0.81%	>0.05
	90	91.16±3.58	90.02±4.01	1.25%	>0.05
Group II	0	88.94±3.27	82.62±3.52	7.11%	<0.001
	30	89.44±3.06	84.42±3.26	5.61%	<0.001
	60	89.92±3.00	85.94±3.22	4.34%	<0.001
	90	90.18±2.45	87.78±2.79	2.66%	<0.001

From table no.4 it was observed that in group I patients statistically significant decrease in mean MAP after giving orthostatic challenge at 0 min, while mean MAP changes after orthostatic challenge were not statistically significant at 30, 60 and 90 minutes postoperatively. Statistically significant decrease in mean MAP in group II patients after orthostatic challenge was observed at o, 30, 60 and 90 minutes postoperatively.

V. Discussion

Spinal anaesthesia is particularly useful because of its simplicity, rapid onset of action, fewer requirements of sophisticated equipment and trained personal and being economical. But despite various advantages anaesthesiologist continue to face confusion about balancing risk and benefits of spinal anaesthesia

because of complication mainly associated with autonomic blockade like hypotension and bradycardia etc. Because of these adverse effect, patient require intense intraoperative and postoperative monitoring. The previous recovery room discharge criteria i.e. supine haemodynamic stability, regression of sensory level by two dermatomes or T10 and return of motor function to lower extremity (as assessed by toe movement) is not too effective as there is no co-relationship between level of motor/sensory function and effect of sympathetic block[5] . So we aimed this study to investigate new discharge criteria based on checking recovery of autonomic function by subjecting the patient to orthostatic challenge in recovery room[3,4].

Other objective of our study is to compare recovery profile after subarachnoid block in elderly versus young patients. As elderly patients are specialized group with respect to pharmacodynamics effect, pharmacokinetics of drug and also because of physiological changes. In present study 100 patients are divided into two group i.e. group I (young) and group II (elderly) with 50 patients in each group. Mean age of group I patient was 32.42±3.44 years and group II was 66.40±3.91 years that was compare with **M.N. Zaidi et al (2008)**[3]study as there mean age for young patient 36.4±5.10 years and elderly patient was 67.8±3.97 years. Also other demographic data also compare with **M.N. Zaidiet al**[3]study.

The mean duration of surgery for group I was 77.6±15.5 min and group II was 80.6±14.6 min that was different from **M.N. Zaidiet al**[3] study as they used intertrochantricfrature for there study as compared to present study in which we used hernia and gynaecological procedure. Also preoperative hemodynamic comparable with **M.N. Zaidiet al**[3] study.

There was definitive correlation between the dermatomal level and incidence of hypotension and bradycardia. In present study mean maximum height of sensory blockade in group I was T7.82±1.10 and in group II was T7.34±1.17 which was comparable with **M.N. Zaidi et al**[3]and**Pitkanen et al**[6]study . In present study five patients in group I and only one patient in group II had motor recovery in the form of toe movement at 90 min in recovery room .The average duration of surgery of these five patients in group I was around 108 min, so motor recovery around 198 min and in group II patient average duration of surgery was 120 min so motor recovey time was 210 min . In the study done by **Alexander et al (1979)**[4] they found toe movement to return after 220 min after subarachnoid block and also **M.N. Zaidi et al**[3]also observed 190 min motor recovery time after subarachnoid administration of drug. So present study correlate with these two authors study. In present study sensory level of regression was higher in group I compared to group II that was also comparable with **M.N. Zaidiet al**[3]study.

In present study the mean preoperative pulse rate and MAP in group I was 87.12±7.17 and 90 ±5.17 and in group II was 84.92±5.91and 91.2±5.42 respectively. But after orthostatic challenge test the mean pulse rate change was 7.08% at 0 min, 1.99% at 30min, 1.7% at 60min and 0.77% at 90 min in group I and in group II was 9.46% at 0min, 7.09% at 30 min, 5.89% at 60min and 2.73% at 90min this result was comparable with **M.N. Zaidi et al**[3]study and **Alexander et al**[4]study. Also mean fall in MAP Less than 10% in present study after orthostatic challenge which is also comparable with **Dainel V. Koneri et al**[5]and **M.N. Zaidi et al**[3]study.

So new discharge criteria using orthostatic challenge test in which if fall in MAP was less than 10% despite of motor and sensory recovery after subarchnoid block was used for shifting patients from recovery room to ward was safe and also cost effective.

VI. Conclusion

From present study we concluded that in elderly patients level of anaesthesia higher than young patients and recovery of sensory, motor and autonomic function will be slower. Also from present study we concluded that the criteria of less than 10% decrease in MAP in two successive orthostatic challenges can be safely applied to elderly population and it will save significant time and resources of recovery room without jeopardising patients safety.

Bibliography

[1]. Wylie and Churchill-Davidsons's A practice of anesthesia 6th edition. Edited by T.J. Healy and P.J. Cohen, Edward Arnold co, 1995 : 712-713.
[2]. UNDP: Human development report 2003 Oxford University press London, 2003.
[3]. Zaidi MN, Bano S, Ahmed M: Aprospective study of recovery profile after subarachnoid block in elderly versus young patients. Indian Journal of Anaesthesia 2008; 52(1);58-62.
[4]. Alexander CM, Teller LE, Gross JB, Owen D, Cunningham C,Laurenciof: New discharge criteria decrease recovery room time after subarachnoid block. Anesthesiology 1989; 70;640-43.
[5]. KnoerlDV, McNully P, Estes C, Conel k: Evalution of orthostatic blood pressure testing as discharge creation from PACU after spinal anaesthesia. J. PerianaesthesiaNurs2001;16; 11-18.
[6]. Orthostatic intolerance: eMedicinePediatrics : Cardiac Disease and Critical Care Medicine. Page 1 to 17.

Dr.Virendra Modi "A Study of Recovery Profile After Subarachnoid Block in Elderly Versus Young Patients." IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 17, no. 1,