

Effect of Valsalva Maneuver in Attenuating Spinal Needle Puncture Pain

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ABSTRACT

Objective: To compare the frequency of pain in patients undergoing elective lower limb surgery between valsalva maneuver versus control group during spinal anesthesia.

Study Design: Randomized controlled trial

Place and Duration of Study: Department of Anesthesia, Dow University of Health Sciences, Civil Hospital, Karachi from 1st June 2018 to 30th November 2018.

Methodology: All patients aged 25 to 50 years of either sex having ASA status I and II undergoing for surgery in sitting position under sub-arachnoid block through midline approach were taken as study participants. Randomization was done and divided in two groups; Group A were those who did not perform valsalva group B were those who perform valsalva. Puncture pain was assessed and measured by visual analogue scale in which 0 indicates no pain whereas, 10 is considered as most painful.

Results: The mean age was 39.76±8.43 years. There were 31 (51.7%) males and 29 (48.3%) females with body mass index in 21 (35%) have ≤25 kg/m² and 39 (65%) have >25kg/m². Mean VAS score was 4.27±2.09 and showed a significant association of pain between groups (p<0.001).

Conclusion: Pain was found significantly lower in patients undergoing elective lower limb surgery with valsalva maneuver during spinal anesthesia.

Keywords: Pain, Elective lower limb surgery, Valsalva maneuver, Spinal anesthesia

INTRODUCTION

Due to extreme needle puncture pain in spine it is considered as one of the most disturbing and influencing factor in patients who have to take anesthesia through spine ultimately leads refusal due to fear and trauma.¹ It usually involves both physical and psychological impact. Various alternative and strategies have been documented to reduce the level of pain. Different sort of pharmacological anesthetic drugs can be used as local anesthesia but it has their own shortcomings.²⁻⁴

The eutectic mixture cannot be applied to relieve the psychological component of pain while the psychological component of pain is limited to non-pharmacological approaches such as care-diversion techniques (pressed balls, audiovisual distraction).⁴⁻⁷ The maneuver of valsalva lowers the physical and psychological components of venous cancer-related pain.^{8,9} The incidence of pain among the control and valsalva maneuver patients were 28/28 (100%) and 3/27 (11.11%).¹⁰

The current study aims to assess the effect of the valsalva maneuver in the reduction of needle pain in spine as no local information is provided. The effect of valsalva maneuver could be different locally as duration of maneuver can be short locally as our people are less active as compared to other part of the world

MATERIAL AND METHODS

This randomized controlled trial study was conducted at Department of Anesthesia, Dow University of Health Sciences, Civil Hospital Karachi from 1st June 2018 to 30th November 2018 and comprised 60 patients (30 patients in each group). Group A were those who did not perform valsalva and group B were those who perform valsalva. All patients aged 25 to 50 years, both sexes with ASA class I and II who were receiving surgery in sitting position under sub-arachnoid block through midline approach were taken as study participants. Patients who had clinical history of scars, previous history of neuraxial block, scars, unable to withstand the mercury-column were excluded. The patients were shown how to mark the VAS scale score. Age, gender, height, weight, BMI, and place of residence were all reported. An oral 2mg lorazepam was given to patients prior to surgery and again on operation day morning. Exactly after 20sec, dose of spinal anesthesia was administered. The lumbar puncture pain was evaluated using a visual analogue scale (VAS) score of [0–10], where 0 represents no pain and 10 represents the greatest agony possible. The outcomes were evaluated by an anaesthetic resident who was not participating in the trial. SPSS-20 was used to enter

and evaluate the data. The Chi square test was used to compare the discomfort of spinal needle puncture considering p-value <0.05 as significant.

RESULTS

Majority 40 (66.7%) patients were presented with >40 years and 20 (33.3%) patients were presented with ≤40 years of age and mean age was 39.76±8.43 years. There were 31 (51.7%) males and 29 (48.3%) females. Mean weight, height, and BMI of the patients were 58.08±5.69 kg, 1.58±0.78 m, and 26.29±4.95 kg/m² respectively. There were 21 (35%) patients with ≤25 kg/m² BMI and 39 (65%) patients with >25kg/m² BMI. Mean VAS score was 4.27±2.09. Diabetes mellitus was found in 23 (38.3%) and hypertension in 20 (33.3%) patients. Smoking status was positive in 25 (41.7%) patients. The overall frequency of spinal needle puncture pain was observed in 34 (56.7%) patients (Table 1). The comparison of spinal needle puncture pain showed a significant association of pain in between groups (p<0.001) [Table 2].

Table 1: Demographic information of the patients (n=60)

Variable	No.	%
Age (years)		
≥40	20	33.3
>40	40	66.7
Gender		
Male	31	51.7
Female	29	48.3
Body mass index (kg/m ²)		
≤25	21	35.0
>25	39	65.0
Diabetes		
Yes	23	38.3
No	37	61.7
Hypertension		
Yes	20	33.3
No		66.7
Smoking status		
Smoker	25	41.7
Non-smoker	35	58.3
Spine needle puncture pain		
Yes	34	56.7
No	26	43.3
Weight (kg)	58.08 ±5.69	
Height (m)	1.58±0.78	
VAS	4.27±2.09	

Table 2: Comparison of pain between groups

Pain	Valsalva Manoeuvre	Control Group	P value
Yes	6 (20%)	28 (93.3%)	0.001
No	24 (80%)	2 (6.7%)	

DISCUSSION

The results of this study showed a significant frequency of pain during spinal anesthesia while patients receiving elective lower limb surgery between valsalva maneuver versus control group. In a prior study, some comparable findings were found that significant reduction in pain was observed in patients.¹⁰

Psychological as well as physiological both aspects get involve towards the pain perception in most of the patients. Fear on unknown consequences strongly impact patient's perception. It often time leads to anxiety for other surgical procedures as well.⁸ Great reduction in pain after valsalva was reported in several studies. It most likely due to distraction from pain or to the activation of per aortic reflex-receptor-arc.^{9,11,12}

In the present study, study group with valsalva showed a substantial drop in spinal puncture frequency as compared to control group. We have therefore observed that, it greatly helps in distracting patients from pain in contrast to control group. This has done by carrying out a valsalva maneuver, in psychological and physiological components of pain. This study has several limitations including subcutaneous and local skin-anesthetic was not performed and was also not double blind.

CONCLUSION

Pain was found significantly lower in patients undergoing elective lower limb surgery with valsalva maneuver during spinal anaesthesia.

REFERENCES

- Gajraj NM, Sharma S, Souter AJ, Pole Y, Sidawi E. A survey of patients who refuse regional anesthesia. *Anesth Analg* 1994;78:S126.
- Morris RW, Whish DK. A controlled trial of pain on skin infiltration with local anesthetics. *Anaesth Intensive Care* 1984;12:113-4.
- Morris R, McKay W, Mushlin P. Comparison of pain associated with intradermal and subcutaneous infiltration with various local anesthetic solutions. *Anesth Analg* 1987;66:1180-2.
- Koscielniak-Nielsen Z, Hesselbjerg L, Brushoj J, Jensen MB, Pedersen HS. EMLA patch for spinal puncture. A comparison of EMLA patch with lignocaine infiltration and placebo patch. *Anesthesia* 1998;53:1218-22.
- Patterson P, Hussa AA, Fedele KA, Vegh GL, Hackman CM. Comparison of 4 analgesic agents for venipuncture. *AANA J* 2000;68:43-51.
- Usichenko TI, Pavlovic D, Foellner S, Wendt M. Reducing venipuncture pain by a cough trick: a randomized crossover volunteer study. *Anesth Analg* 2004;98:343-5.
- Wismeijer AA, Vingerhoets AJ. The use of virtual reality and audiovisual eyeglass systems as adjunct analgesic techniques: a review of the literature. *Ann Behav Med* 2005;30:268-78.
- Gupta D, Agrawal A, Dhiraaj S, Tandon M, Kumar M, Singh RS, et al. An evaluation of balloon inflation on venous cannulation pain in children: a prospective, randomized, controlled study. *Anesth Analg* 2006;102:1372-5.
- Agarwal A, Sinha PK, Tandon M, Dhiraaj S, Singh U. Evaluating the efficacy of the valsalva maneuver on venous cannulation pain: a prospective, randomized study. *Anesth Analg* 2005;101:1230-2.
- Kumar S, Gautam SKS, Gupta D, Agarwal A, Dhiraaj S, Khuba S. The effect of valsalva maneuver in attenuating skin puncture pain during spinal anesthesia: a randomized controlled trial. *Korean J Anesthesiol* 2016;69(1):27-31.
- Englstrom JW, Martin JB. Disorders of the autonomic nervous system. In: Braunwald E, Fauci AS, editors. *Principals of internal medicine*. New York: McGraw-Hill; 2001; 2416-21.
- Randich A, Maixner W. Interaction between cardiovascular and pain regulatory systems. *Neurosci Biobehav Rev* 1984;8:343-67.