THE EFFECT OF PNEUMOPERITONEUM AND POSITION ON THE OPTIC NERVE SHEATH DIAMETER DURING ROBOTIC RADICAL PROSTATECTOMY; AN ULTRASONOGRAPHIC EVALUTION

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AIM

The deep trendelenburg position and pneumoperitoneum are applied in cases of Robot-Assisted Laparoscopic Radical Prostatectomy (RALRP) operations are thought to increase intracranial pressure. Orbital ultrasonography as a non-invasive measurement of the optic nerve sheath diameter (ONSD) have been reported in recent years in correlation with intracranial pressure. In this study, RALRP operations were done in different intra-abdominal pressures and the affect of the ONSD with different intra-abdominal pressure levels have been shown and research has been done to examine whether changes made in the cognitive functions have an impact on the patients.

MATERIALS AND METHODS

RALRP operation arranged 40 patients to be included in this study whose ASA physical status was I-II and ages were 50-70 included to this study. The patients were divided into 2 groups, Group I; with insufflation pressure as 10 mmHg and Group 2; as 15 mmHg. The optic nerve sheath diameter measuring was done by ultrasound 10 times from the right eye of the patients with its 4 axis; before the induction of anesthesia, 5 min after induction, 5 min after abdominal insufflation, 5, 15, 30, 60 and 120 min of the trendelenburg position, 5 min after intra-abdominal insufflation and trendelenburg was terminated and 5 min after extubation was applied. Standardized Mini Mental State Examination (SMMSE) was performed 1 day before and 3 days later the operation.

Fig. II. Trendelenburg position during RALRP

CONCLUSION

These results determined that lower intracranial pressure occurs at the low insufflation group by lower ONSD values with the prolongation of the deep trendelenburg position, but this difference did not make a significant difference in terms of cognitive function, which is viewed by the SMMSE.

Fig.I. The ONSD measuring at 4 axis by ultrasound

RESULTS

There were no differences between the two groups for the operation time and demographical values. ONSD value was significantly ($p < 0,05$) lower in Group I at 60. and 120. min of the trendelenburg position and at the 5th min of returning to supine position. According to SMMSE results for the two groups, there were no difference between preop and postop. ean airway pressure and ONSD values in deep trendelenburg position during operation increased in both groups compared with baseline values; but decreased back to levels similar to their baseline values at the end of the operation parameters with the supine position.

	Group I			Group II			p
	Mean±SD	Med	Min-Max	Mean±SD	Med	Min-Max	
ONSD							
Before anesthesia	4,7 ± 0,1	4,7	4,5 - 5,0	4,7 ± 0,2	4,7	4,3 - 5,0	0,447
Entubation 5th min.	4,9 ± 0,2	4,9	4,5 - 5,2	4,8 ± 0,2	4,8	4,4 - 5,3	0,323
Abdominal Ins. 5th min.	5,0 ± 0,2	5,0	4,7 - 5,6	4,9 ± 0,3	4,9	4,4 - 5,6	0,083
Trend. P. 5th min	5,0 ± 0,7	5,1	2,1 - 5,6	5,1 ± 0,3	5,0	4,4 - 5,7	0,239
Trend. P. 15th min	5,3 ± 0,2	5,2	5,0 - 5,8	5,2 ± 0,3	5,2	4,5 - 5,8	0,694
Trend. P. 30th min	5,3 ± 0,2	5,3	5,0 - 5,9	5,4 ± 0,3	5,4	4,7 - 5,9	0,088
Trend. P. 60th min	5,5 ± 0,3	5,5	5,0 - 5,9	5,6 ± 0,3	5,7	4,9 - 6,1	0,036
Trend. P. 120th min	5,3 ± 0,6	5,5	2,9 - 6,0	5,8 ± 0,4	5,8	4,6 - 6,2	0,000
Supine P. 5th min.	5,1 ± 0,3	5,1	4,4 - 5,7	5,3 ± 0,2	5,3	4,7 - 5,6	0,016
Extubation 5th min.	4,9 ± 0,2	4,9	4,4 - 5,3	5,0 ± 0,2	5,0	4,6 - 5,3	0,098

Table I. Comparison of ONSD values for two groups

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1. Awad H, Santilli S, Ohr M, ve ark. The effects of step trendelenburg positioning on intraocular pressure during robotic radical prostatectomy. Anesth Analg 2009;109(2):473-8.
2. Le A, Hoehn ME, Smith ME, Spentzas T, Schlappy D, Pershad J. Bedside sonographic measurement of optic nerve sheath diameter as a predictor of increased intracranial pressure in children. Ann Emerg Med 2009 Jun;53(6):785-91.
3. Rajajee V, Vanaman M, Fletcher JJ, Jacobs TL. Optic Nerve Ultrasound for the Detection of Raised Intracranial Pressure. Neurocrit Care 2011 Jul 19.