CEREBRAL OXYGENATION USING NEAR-INFRARED SPECTROSCOPY IN BEACH-CHAIR POSITION DURING SHOULDER ARTHROSCOPY UNDER DIFFERENT ANAESTHESIA TYPES

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Background and aims

Moderate hypotension reduces intraarticular bleeding and improves operative field visualisation in patients undergoing shoulder arthroscopy in beach chair position¹. On the other hand, patients are at increased risk for cerebral hypoperfusion and desaturation^{2,3}. The aim of the study was compare cerebral oxygenation and incidence of desaturation events between regional with sedation and mixed (general and regional) anaesthesia in patient undergoing shoulder arthroscopy in beach chair position.

Objectives and methods

28 patients undergoing shoulder arthroscopy in regional (group I; N =14) or mixed (group II; N=14) anaesthesia were enrolled in retrospective observational study.

Noninvasive near - infrared spectroscopy method was used to measure cerebral oxygenation in both hemispheres. Heart, peripheral oxygen saturation, noninvasive mean arterial pressure (MAP), minimum alveolar concentration (MAC) of sevoflurane, EtCO₂ were registered every 5 minutes during operation.

Oxygenation decrease ≥20% from baseline or absolute value <55% for >15 seconds was defined as desaturation event.

Statistical analysis was done using SPSS v.22. This study was approved by the Lithuanian Bioethics Committee.

Results

Characteristic	I st group (N=14)	II nd group (N=14)	P value
Gender			
Female	9 (64.3 %)	9 (64.3 %)	1
Male	5 (35.7 %)	5 (35.7 %)	
Age (years old)	53 ± 12	54 ± 12	0.923
BMI (kg/m ²)	27 ± 6	28 ± 3	0.781
ASA grade			0.116
I	5 (35.7 %)	1 (7.1 %)	
II	7 (50.0 %)	12 (85.7 %)	
III	2 (14.3 %)	1 (7.1 %)	
Side of regional block			0.705
Left	6 (42.9 %)	7 (50.0 %)	
Right	8 (57.1 %)	7 (50.0 %)	

Table 1. General characteristics of patients in two groups.

Figure 1. Mean arterial pressure (MAP) in two groups.

Mean arterial pressure was higher in the Ist group (83.8±7.5 mmHg vs. 68.9±3.7 mmHg; $p < 0.001$). Only regional anesthesia with sedation is not sufficient to reduce MAP to the required level for bleeding reduction, but desaturation events were not more frequent in mixed anaesthesia group, despite statistically significant lower MAP.

Figure 2. Cerebral oxygenation in two groups.

Total cerebral oxygenation was lower in the Ist group (75.1±8.8% and 84.2±9.4%; $p < 0.001$), but while comparing cerebral oxygenation in each moment of measurement between groups, only in 29.4% significant differences were found. The incidence of cerebral desaturation was 1.3% in the Ist group and 0.3% in the IInd group.

Conclusions

Even with higher mean arterial pressure, cerebral oxygenation was lower in the Ist group, because propofol inhibited spontaneous respiration and oxygen therapy through nasal cannulas did not provide as high cerebral oxygenation as in intubated patients. Nevertheless, both anaesthesia types can be equally safely applied in this type of operations.

References

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