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RELIABILITY OF ASA ANESTHETIC RISK IN CLINICAL PRACTICE AS AN INDEPENDENT PREDICTOR OF MEDICAL COMPLICATIONS AND INTRA- AND POSTOPERATIVE MORTALITY

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The ASA score is frequently used to estimate subjectively preoperative health status. While initially created for the collection and reporting of statistical data in anesthesia [1], it is now used to predict perioperative risk [3].

Perioperative morbidity and mortality is a significant public health problem, due to its impact on patients’ health, short- and long-term survival and also the resources used in the health service. Surgical complications occur in 3-17% of patients [4,5].

Materials and methods
The study was conducted based on the analysis of information from the primary research sources regarding 1799 patients who were investigated retro-prospectively, during the years 2008-2016 (for 108 months), in the Clinic of the Chair of anesthesiology-reanimatology no. 1 Valeriu Ghere of the National Scientific-Practical Center of Urgent Medicine (Chisinau, Republic of Moldova).

Initially, descriptive statistics were performed (tables, box graphs, pie), the age value being adjusted to the sex of the patients and the anesthesiological risk ASA. Age, considering the distribution different from the normal one, was represented in the form of median, 25th, 75th percentiles, as well as the interquartile deviation. The null hypotheses were formulated, according to which there are no changes in the values of the age in dynamics. Hypothesis testing was performed by the nonparametric method (Kruskal-Wallis), in the case of applied statistical significance and multiple comparisons. The determination of the trend in dynamics was estimated by the Jonckheere-Terpsta test. Also, in the case of statistical significance, in order to estimate the practical value the effect size was calculated, 95% confidence intervals (95% CI) for the difference of the medians. The aforementioned procedures were also applied for the data not adjusted to the sex of the patients and the anesthesiological risk ASA.

The patient’s age-anesthesia risk association after ASA was estimated by applying the Spearman ρ test for categorical (ASA) and continuous (age) data. Initially, the relationships examined were appreciated by constructing the scatterplot with the approximation line. Effect size is a basic criterion for assessing practical significance. The results were adjusted for the sex of the patients.

The effects of age and sex of patients on ASA anesthesia risk were estimated by constructing a regression model.

Results
Obviously, older age presents a higher anesthesiological risk (Figure 1). The interdependence of these factors is not quantitatively estimated in the literature.

![Fig. 1. The correlation diagram between age and anesthetic risk ASA, with the approximation line.](image)
which means that chronic respiratory failure and age represent 6.3% of the variability in lethality at this category of patients, Hosmer and Lemeshow Test $p>0.05$, that is, these variables are of interest and can be used to construct the respective mathematical model (Table 1). OR for respiratory failure being 4.098, 95% CI 1.796-9.352.

**Discussions**

The association of postoperative morbidity leads to mortality, thus the accumulation of morbidities precedes mortality. Increased morbidity after surgery correlates equally with increased mortality.

In our study, the following issue was also examined: what is the lethality rate of patients who have elective femoral surgery in our clinic? For 46 months, out of 1779 elective surgeries on the femur, 25 patients died in the postoperative period (the lethality after discharge), the lethality rate being 1.4%. In the group with the anesthesiology risk ASA I-II (1063 interventions) no deaths were recorded, and in the group with the anesthesia risk III, the lethality constituted 3.49% (25 cases out of 691 elective surgeries on the femur).

As mentioned previously in the case of patients with anesthesiological risk I-II, who were operated on the femur, there were no deaths, information that we enjoy. At the same time, the mortality rate in patients with high anesthesia risk was 3.49% (25 cases of 716 performed anesthesia). Taking into account the fact that the anesthesiological risk of patients may be a confounding factor for these relationships, we analyzed the relationship between age and ASA risk for men and women separately (Figure 2). To verify this idea, we investigated if exist a relation between the sex of patients and ASA by applying the $\chi^2$ Pearson test, which is equal to $87,797 \text{ df}=2, p<0.001$. That is, the null hypothesis (there is no link between the sex of patients and the anesthesiological risk ASA) can be rejected and the relationship examined has at least statistical significance $p$ Spearman (for men) = 0.493 $p<0.001$, for women 0.446 $p<0.001$. That is 24.3% of the anesthesiological risk is determined by age in men and 19.9% in women. These results are more true than the 26.8% obtained for the total population.

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The model has the following characteristics: Omnibus Tests of Model Coefficients $\chi^2 = 11,916 \text{ df}=2, p=0.003$ (the result is statistically significant), Nagelkerke $R^2 = 0.063$, which means that chronic respiratory failure and age represent 6.3% of the variability in lethality at this category of patients, Hosmer and Lemeshow Test $p>0.05$, that is, these variables are of interest and can be used to construct the respective mathematical model (Table 1). OR for respiratory failure being 4.098, 95% CI 1.796-9.352.

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**Table 1. Variables in the Equation**

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
<th>95% C.I.for EXP(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a</td>
<td>Respiratory failure</td>
<td>1.411</td>
<td>.211</td>
<td>11.226</td>
<td>1</td>
<td>.001</td>
<td>4.098</td>
<td>1.796-9.352</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>.018</td>
<td>.020</td>
<td>.783</td>
<td>1</td>
<td>.376</td>
<td>1.018</td>
<td>1.018-1.059</td>
</tr>
<tr>
<td></td>
<td>Constant</td>
<td>-5.033</td>
<td>1.515</td>
<td>11.039</td>
<td>1</td>
<td>.001</td>
<td>.007</td>
<td>.007</td>
</tr>
</tbody>
</table>

*a. Variable(s) entered on step 1: Respiratory failure, age.*
risk of the patients increases in dynamics (because the contingency of patients changes in proportion to their age, the male gender being a negative factor for the anesthesiological risk), we are interested to identify the factors that affect the lethality rate for this category of patients.

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Conclusion.

In the Republic the lethality rate of patients undergo elective surgery on the femur is comparable with the world data, in the ASA II group the mortality is 0%, and for the ASA III group – 3.5%, the local study features show a decreasing tendency for lethality and patients being younger.

Chronic respiratory failure and age are the risk factors for increased lethality in patients with ASA III, beneficiaries of surgery on the femur. The proposed predictive models are far from ideal, which further requires the study and determination of potential factors for optimizing the prediction of lethality.

ЛІТЕРАТУРА

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PEDIATRIC PATIENTS WITH IMPLANTED LEFT VENTRICULAR ASSIST DEVICES END EXPIRIENCE OF PERSONALIZATION OF TREATMENT IN EARLY POSTOPERATIVE PERIOD

Mazurenko O.P.

У дорослому населенні пристрої безперервного потоку повільніше переважають над пульсувальним LVAD, що становить понад 90%. З постійною мінімізацією приладів серед дітячих кардіологів зростає кількість пропозицій щодо використання ВАД безперервного потоку у дітей. Відповідно до першого звіту PediMACS, приблизно половина (54% 109 з 200) зареєстрованих пристроїв довгострокового періоду – це пристрої безперервного потоку.

Аналіз на основі даних PediMACS, приблизно половина (54% 109 з 200) зареєстрованих пристроїв довгострокового періоду – це пристрої безперервного потоку. На їх основі можна зробити висновок про можливість використання пульсувального LVAD у дітей. До цього звіту PediMACS приблизно половина (54% 109 з 200) зареєстрованих пристроїв довгострокового періоду – це пристрої безперервного потоку.

Для практичної оцінки ризику правошлуночкової недостатності в ранньому післяопераційному періоді була дуже схожа на таку, яку застосовували у пацієнтів після операції Фонтана, включаючи специфічні тактики репаратури підтримки кровообігу, до введення апарату механічної підтримки кровообігу (МПК) та відсутності пристроїв кровообігу.

Рання бівентрикулярна МПК корелює з кращою виживаністю порівняно із застосуванням пульсувального LVAD у низького віку. Бівентрикулярна МПК у дорослої популяції призначається для персоналізації людей з анеомією правошлуночка, призначається для імплантації бівентрикулярної МПК або для трансплантації серця.

Ключові слова: механічна підтримка лівого шлуночка у дітей, застійна серцева недостатність у дітей.


ДОСВІД ПЕРСОНАЛІЗАЦІЇ ЛІКУВАННЯ У ПЕДІАТРИЧНІ ПАЦІЄНТИ З АПАРАТАМИ МЕХАНІЧНОЇ ПІДТРІМКИ ЛІВОГО ШЛУНОЧКА ТА ДОСВІД ПЕРСОНАЛІЗАЦІЇ ЇХ ЛІКУВАННЯ В РАННЬОМУ ПІСЛЯОПЕРАЦІЙНОМУ ПЕРИОДІ