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Preview Notes

Oxy-hemodynamic effects during positioning of patients with myocardial acute infarction: a clinical trial

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ABSTRACT

Aim: To analyze the effects of oxygen consumption and myocardial contractility during positioning in bed for patients with acute myocardial infarction (AMI) compared to non-cardiac hospitalized individuals. **Method**: clinical trial, controlled, randomized, parallel, blind. Randomization: position order in different decubiti; sizing: finite populations based on the prevalence of AMI, totaling 30 heart attack patients; Controls: hospitalized individuals matched for age and sex with blood pressure of less than 50 mm/Hg. Inclusion criteria for heart patients: Killip class I and II, up to 72 hours after the event. Data processing: SPSS®; statistical analysis: mean, mode, median; variance, standard deviation and coefficient of variation, Pearson coefficient, hypothesis testing, confidence intervals and ANOVA. 5% significance level. **Preliminary results**: significant difference (p=0.04) was found after comparing the cardiac index between decubitus positions. The left lateral position presented the smallest score.

Descriptors: Patient Positioning; Hemodynamics; Myocardial Infarction.

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SITUATION AND ITS SIGNIFICANCE

Cardiovascular diseases (CVD) are one of the leading causes of mortality in adults. Potential symptoms can appear early in the body gradually become CVD[1]. Data released by the World Health Organization show that, in 2011, 17 million people died due to circulatory system problems. Acute myocardial infarction (AMI) belongs to this group of diseases, and this can lead to hospitalization that lasts from 5 to 8 days. The positioning in the bed of patients with acute coronary syndromes can alter gas exchange, cardiac performance and the distribution of the peripheral blood flow[2,3]. There are statistically significant differences in venous oxygen saturation (VOS) between non-cardiac and heart patients regarding three bed positions - left lateral decubitus (LLD), right lateral decubitus (RLD) and supine position. The largest difference occurs in the first 4 minutes after the change in position and at the LLD position[2], which presents more changes in static volume, regional ventilation, perfusion and diffusion capacity alterations. Cardiography has been an alternative to hemodynamic monitoring. Given that it is non-invasive, easy to handle, and therefore feasible for clinical practice, it is a tool that is increasingly used as an AMI prognostic indicator, as a substitute for the Swan-Ganz catheter.

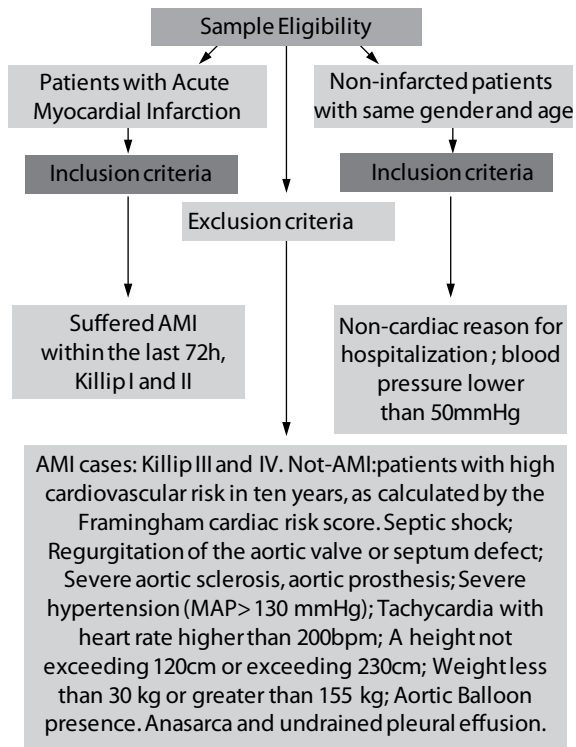
AIM

To analyze the impact of changes in the positioning in bed of patients with AMI compared to other hospitalized individuals matched for age and sex with pulse pressure less than 50 mm/Hg, regarding oxygen consumption ranges and myocardial contractility.

METHOD

A clinical trial that was controlled, randomized, parallel, blind type was used. During the patient's positioning in bed, we used hemodynamic monitoring by cardiography bioimpedance for 5 minutes in the supine position, 4 minutes in LLD or RLD, 5 minutes again in supine, 4 minutes in the opposite lateral position, and another 5 minutes in supine. The first change of decubitus will be randomly done by drawing lots. We established a sample of 60 patients: 30 infarcted and 30 non-infarcted, preserving gender and age of the samples in accordance with the eligibility criteria (Figure 1).

Figure 1 – Sample Elegibility criteria. Niterói, 2015.



Source: Author's research

The following variables for analysis were selected: heart rate (HR), oxygen saturation (O_2 S), systolic blood pressure (SBP), diastolic blood pressure (DBP), cardiac output (CO), cardiac in-

dex (CI) left ventricle work index (ITCE), thoracic flow index (IFCI), oxygen delivery index (IEO_2), left systolic work index (EITI), pre-ejection period of the left ventricle (PPEJEC), systemic vascular resistance (SVR), myocardial oxygen consumption (MO_2C). **Primary outcome**: analysis of the oximetric and hemodynamic responses through changing the positioning of patients during up to 72 hours after AMI. **Secondary outcome**: postural discomfort and trepopnea, identified by Corllet's discomfort scale[4] and the checklist for trepopnea, prepared by the authors. This research is under way, with the setting being a private hospital in Niterói / RJ, known as a reference for cardiac emergencies. Data collection began in June 2015 and is being carried out by a team of teachers, masters' degree students, specialist nurses and nursing students. The team is distributed in shifts to carry out the interventions and collect patients for the study. Regarding the ethical aspects, this project was approved by the Research Ethics Committee of the Medical School of the Antônio Pedro Hospital / UFF University Hospital (opinion 1,124,755) on 06/25/2015. We used a cardiac impedance device, the Cardioscreen 2000 (Medis, Germany), to obtain the hemodynamic variables. Data is organized in a spreadsheet for analysis and we are using statistical package *PASW 20.0 for Windows* software owned by SPSS. For descriptive statistics we assessed the mean, mode, median; variance, standard deviation and coefficient of variation; and the Pearson coefficient; for inferential descriptive analysis, we used a hypothesis test to compare means, confidence intervals and the ANOVA range. The significance level established was 5% and the confidence interval was 95%.

PRELIMINARY RESULTS

Partial sample of 6 patients with AMI. The average heart rate when in right lateral position, although lower (77bpm), does not differ from the left (79bpm) ($p = 0.66$). Comparing cardiac indexes in the different positions, we found a significant difference ($p = 0.04$), with the LLD having the lowest value. We note that, although HR and CI are dependent variables, there was still some difference in CI, suggesting that this should be attributed to the alteration in systolic volume.

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