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CARDIAC AUTONOMIC MODULATION BEHAVIOR IN RESTING ASTHMATIC WOMEN

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Background: Asthma is characterized by obstruction to expiratory airflow, reversible, and respiratory symptoms such as shortness of breath, wheezing and coughing. In addition to these, asthmatic individuals often present systemic repercussions of the disease, with changes in the cardiovascular system being particularly common, particularly changes in cardiac autonomic control.

Objectives: To compare the behavior of cardiac autonomic modulation at rest in controlled and healthy asthmatic women.

Methods: After ethical approval, 34 female participants were included, non-smokers, aged between 18 and 40 years, with and without a medical diagnosis of asthma. The participants underwent analysis of their heart rate at rest for 10 minutes, using a chest sensor that records cardiac signals. After completion of collection, the data was stored and transferred to the software for analysis in the time domain: mean heart rate interval (Mean iRR), mean heart rate (Mean HR), square root of the mean squared differences of the RR intervals (RMSSD) and pNN50 and time domain: low frequency (LF) domain indices that indicate sympathetic modulation, high frequency (HF): parasympathetic activity and the LF/HF: sympathovagal balance. The Shapiro-Wilk test was applied to verify the distribution of data, which were expressed as mean and standard deviation (SD) values. To analyze the results, the Independent Student's T Test was used.

Results: During the rest period, there was a predominance of sympathetic activity in asthmatic women observed through the LF time variable (61 ± 16 vs 40 ± 14) and lower values of parasympathetic activity, verified through the HF index (38 ± 16 vs 59 ± 14), when compared with healthy participants, respectively. Additionally, lower RMSSD values, representing parasympathetic, were found in asthmatic participants (39 ± 28 vs 65 ± 45) and higher Mean HR values (74 ± 13 vs 69 ± 10) and lower Mean iRR values (826 ± 142 vs 882 ± 121) were observed in asthmatic women, respectively.

Conclusion: Asthmatic women present changes in the behavior of cardiac autonomic modulation at rest, showing greater sympathetic activity, which differs from what was expected. For future research, we suggest investigating different classifications of asthma, as well as comparing men and women.

Implications: These results may open new possibilities for additional studies and encourage the implementation of individualized protocols for this population.

Keywords: Asthma, Heart Rate, Women

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ASSOCIATION BETWEEN SEDENTARY BEHAVIOR AND RISK OF FALLS IN INDIVIDUALS ON HEMODIALYSIS

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Background: Individuals with chronic kidney disease in hemodialysis have a high risk of falls. Additionally, these individuals present high sedentary time. The relation between sedentary behavior and the risk of falls needs to be investigated for individuals on hemodialysis.

Objectives: The primary aim of this study was to verify the association between sedentary behavior and the risk of falls in individuals on hemodialysis. The secondary aims were to identify the incidence of falls and to compare the sedentary behavior between fallers (at least one recording of falls) and nonfallers (without recording of falls).

Methods: This 12-month prospective study included individuals in regular hemodialysis. Sociodemographic, clinical, and laboratory data were recorded from an interview. Sedentary behavior was evaluated by the sedentary time recorded on dialysis and nondialysis days using a triaxial accelerometer (wGT3X-BT, ActiGraph). The accelerometer was positioned on the individuals' dominant waist, and they were instructed to wear it for eight consecutive days during waking hours. After the initial assessment, the occurrence of falls was monitored monthly for 12 months according to the fall definition as an unexpected event in which the individual came to rest on the ground, floor, or lower level. A descriptive analysis was conducted and comparisons between fallers and nonfallers were made by Student T-test. Unadjusted and adjusted logistic regression models investigated the association between sedentary time and the

risk of falls, with falls as the dependent variable. A p-value of < 0.05 was considered statistically significant.

Results: This study included 96 individuals (59.3 ± 12.3 years old, 57.3% male). The incidence of falls was 29.2%. Fallers presented lower sedentary time on nondialysis days than nonfallers did (504.9 ± 136.7 vs. 580.9 ± 120.0 minutes per day, $p = 0.012$). In the unadjusted logistic regression analysis, sedentary time on nondialysis days was directly associated with risk of falls [OR: 1.005 (1.001 to 1.009); $p = 0.016$]. After adjustment for potential confounders, including age, gender, time on hemodialysis, body mass index, cardiovascular disease, diabetes mellitus, sedentary time on nondialysis days remained associated with risk of falls [OR: 1.005 (1.000 to 1.009) $p = 0.037$].

Conclusion: Higher sedentary behavior on nondialysis days increased the risk of falls for individuals on hemodialysis.

Implications: The assessment of sedentary behavior can be used to identify individuals on hemodialysis with higher risk of falls and to contribute for the development of preventive strategies.

Keywords: Renal Dialysis, Accidental falls, Sedentary Behavior

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INFLUENCE OF SEDENTARY TIME ON FUNCTIONAL CAPACITY AND LEVEL OF PHYSICAL ACTIVITY LEVEL AFTER A PULMONARY REHABILITATION PROGRAM

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Background: Pulmonary rehabilitation (PR) improves functional capacity in individuals with Chronic Obstructive Pulmonary Disease (COPD); however, these effects diminish over time, and these individuals exhibit a vicious cycle of sedentary behavior, leading to functional losses. However, there are still gaps in the literature regarding whether this behavior influences functional capacity, physical activity levels post-PR, and the maintenance of long-term benefits.

Objectives: To verify whether pre-PR sedentary time can explain functional capacity and physical activity levels post-rehabilitation and over six months.

Methods: This is a longitudinal study conducted on individuals with COPD who completed an eight-week PR program based on functional tests. The study was approved by the institution's Ethics Committee. Participants were assessed at three time points: pre-PR, post-PR and six months after PR. The assessments included functional capacity (six-minute walk test - 6MWT and six-minute step test-6MST). To measure sedentary behavior and physical activity levels, an accelerometer was worn on the right thigh for seven consecutive days. The accelerometer data were processed using ActiPASS software, and repeated measures ANOVA, Pearson Correlation and simple linear regression analysis were conducted using SPSS. The significance level was set at $p = 0.05$.

Results: A total of 26 individuals with COPD were evaluated, with a mean age of 67 ± 7 years, 15 (58%) males, FEV1 of $51 \pm 14\%$, and a BMI of 25 ± 5 Kg/m². There was a significant improvement in functional capacity from pre- to post-PR with no differences after six months. Regarding physical activity levels, no significant differences were found across the three time points. A correlation was observed

between pre-PR sedentary time and 6MWT ($r = -0.506$, $p = 0.008$), 6MST ($r = -0.532$, $p = 0.005$), post-PR physical activity level ($r = -0.616$, $p = 0.001$) and six-month post-PR physical activity level ($r = -0.760$, $p < 0.001$). Regression analyses showed that the pre-PR sedentary time explained 22.5% of the variance in functional capacity for the 6MWT (adjusted $R^2 = 0.225$, $p = 0.008$), 25.4% for the 6MST (adjusted $R^2 = 0.254$, $p = 0.005$), 35.3% for the post-PR physical activity level (adjusted $R^2 = 0.353$, $p = 0.001$), and 55.6% for six month post-PR physical activity level (adjusted $R^2 = 0.556$, $p < 0.001$).

Conclusion: Pre-PR sedentary time explained the variance in functional capacity and physical activity levels post-PR, as well as long-term physical activity levels. This reinforces the need to encourage more sedentary individuals to break this behavior during and after PR to maintain functional gains.

Implications: The findings of this study highlight the importance of Behavior change strategies targeting more sedentary individuals to enhance PR responses and maintain its long-term benefits.

Keywords: COPD, Pulmonary Rehabilitation, Sedentary Behavior

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FEASIBILITY AND REPRODUCIBILITY OF THE UNSUPPORTED UPPER LIMB EXERCISE TEST AND SIX-MINUTE PEG BOARD RING TEST FOR CHILDREN AND ADOLESCENTS

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Background: Activities involving the upper limbs are part of daily life in home, work, or leisure environments. However, children and adolescents with chronic lung disease, in certain situations, may experience limitations in the use of their upper limbs (UL), such as reduced strength and endurance of the UL. Much is known about the Unsupported Upper Limb Exercise Test (UULEX) and Six-Minute Peg Board Ring Test (6MBRT) in adult individuals, but there is no description in the literature regarding the use of UULEX and 6MBRT in the pediatric population.

Objectives: To evaluate the feasibility and reproducibility of two field clinical tests for upper limbs (Unsupported Upper Limb Exercise Test - UULEX and Six-Minute Pegboard Ring Test - 6PBRT) in children and adolescents.

Methods: Feasibility study. Fifteen healthy volunteers aged 6 to 17 years were included. Spirometry was performed, followed by randomization of three tests: Cardiopulmonary Exercise Test (CPET) or UULEX or 6PBRT. The CPET was performed on an upper limb ergometer with a load increment protocol every minute. For UULEX, the volunteer sits in front of a panel and raises their arms while holding bars of different weights (0.25 kg to 2.0 kg) at different heights; outcome: execution time. For 6PBRT, the volunteer sits in front of a panel with four pins (two upper and two lower) and moves rings from the lower pins to the upper ones (and vice versa) for six consecutive minutes; outcome: number of rings moved. For all tests, maximum oxygen consumption (VO_{2peak}) and peak ventilation per minute (VE_{peak}) were also evaluated as outcomes. The UULEX and 6PBRT were performed twice each (test and retest), with a 30-minute interval between each. For feasibility, less than 15% of volunteers could reach the ceiling effect and/or floor effect.