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## EFFECTS OF STRENGTH TRAINING IN PATIENTS WITH MILD TO MODERATE PARKINSON'S DISEASE: A SYSTEMATIC REVIEW OF LITERATURE

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**Introduction and Purpose:** Current clinical evidence shows that exercise has therapeutic value for patients with Parkinson's disease. However, the literature reviews are controversial about the real benefit of isolated strength training for patients with Parkinson's disease. To identify the benefits of strength training for patients with mild to moderate idiopathic Parkinson's disease, performing an overall assessment of motor, cognitive, cardiovascular and quality of life effects.

**Material and Methods:** Literature research was conducted in December 2017 in the following databases: PUBMED, LILACS, PEDRO and SCIELO. The research was conducted in the English language with the following terms or key words: resistance training, parkinson's disease, strength training, muscle strength, rehabilitation and randomized controlled trial.

**Results:** 18 articles were included in the qualitative analysis of this systematic review. All articles were randomized, published in magazines and newspapers online. Systematic reviews of literature and meta-analyses were excluded. Participants included in the studies were patients with mild and moderate idiopathic Parkinson's disease (stages 2 and 3) of any age and gender. The intervention used is isolated strength training (progressive or not), with a minimum training time of 8 weeks and a minimum of 2 hours a week. Patients in the intervention group may be compared with another type of intervention or control group. The results of the motor standard, cognitive evaluation, quality of life and cardiovascular evaluation will be evaluated.

**Discussion:** Falls are common and disabling in Parkinson's patients. Studies show that half of the patients may fall at least once a year. The analysis of the results shows that strength training can be considered a good strategy to prevent falls, and it should be emphasized that it is not the only intervention capable of reducing the number of falls and analyzing the balance and walking pattern, as well as individualize the treatment of each patient. The unified scale of evaluation of Parkinson's disease is used to evaluate motor and non-motor aspects related to daily life experiences and the symptoms of patients with Parkinson's. According to three recent systematic reviews, we can conclude that strength training can have a positive impact on UPDRS III and is an excellent form of rehabilitation treatment for patients with mild to moderate Parkinson's disease. Regarding the effects of strength training to improve balance and postural stability, it can be affirmed that there may be a functional improvement of patients with strength training, but more studies will be necessary to conclude whether this type of intervention is superior or complementary to strength training. balance training, now critical to the rehabilitation of patients with Parkinson's disease. Evidence suggests that bradykinesia, one of the cardinal signs of Parkinson's disease, is a deficiency mediated by both basal ganglia change, mass loss and muscle strength mediated by physical inactivity as well as by age. All articles that evaluated the relationship between bradykinesia and strength training in this systematic review reported that resistance training improved bradykinesia when compared to control and other interventions. Studies evaluating quality of life, cognition and functional performance have concluded that resistance training is important in functional improvement, quality of life and cognition.

**Conclusion:** Strength training has a positive effect in several motor aspects such as improvement of muscular strength, bradykinesia, UPDRS III, with consequent impact on the gait, balance, and stability. This may lead to a reduction in the risk of falls and improvement of functional independence. The studies also show the positive impact of strength training on the improvement of the life quality as well as improvement of the functional autonomic cardiovascular disease.

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## APPLICATION OF THE SEATTLE CRITERIA IN THE ELECTROCARDIOGRAPHIC ASSESSMENT IN FEDERATED ATHLETES

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**Introduction and Purpose:** The assessment of the electrocardiogram (ECG) in athletes remains controversial, with lack of standardization and difficulty in applying specific criteria in its interpretation. The main purpose of pre-competitive screening of athletes is to enable early (pre-clinical) identification of pathological conditions associated with increased risk of serious clinical events, including sudden death. The majority of disorders associated with an increased risk of sudden cardiac death (SCD) are suggested or identified by abnormalities on a resting 12-lead ECG. Whether used for the evaluation of cardiovascular-related symptoms, a family history of inheritable cardiac disease or premature SCD, or for screening of asymptomatic athletes, ECG interpretation is an essential skill for all physicians involved in the cardiovascular care of athletes. The purpose of this study was to assess variability in the interpretation of the ECG in athletes.

**Material and Methods:** The ECGs of 480 federated athletes were assessed, prospectively according to Seattle Criteria and the training in their reading provided by the British Journal of Sport Medicine. The study was performed from January 1st to May 31st 2018 in Morteros city (Córdoba province-Argentina) and was part of the medical examination of medium and high competence (EMMAC), mandatory by law since 2010.

**Results:** The average age of athletes was of 16.51 years old (se = 0.40, min = 7, max = 64, N = 480). The most frequent sport practiced by athletes was soccer (71% of the cases) followed by basketball (14%) and volleyball (11%). The rest of the sports (eg. swimming, tennis, gymnastics) were scarcely represented (<2%). Of the 480 electrocardiograms evaluated, 333 were normal electrocardiograms, 128 presented normal findings in athletes including sinus bradycardia and isolated voltage criteria for left ventricular hypertrophy (LVH), 9 were borderline and 30 presented pathological findings, 10 of these with signs of LVH. The borderline and pathological cases were derived to perform complementary studies such as Doppler echocardiogram, 24-hour holter, myocardial perfusion, etc.

**Discussion:** Studies demonstrate that without further education the ability of many physicians to accurately interpret an athlete's ECG is relatively poor and may lead to an unacceptable rate of false-positive interpretations and unnecessary secondary evaluations. However, providing physicians standardized criteria with which to evaluate an ECG considerably improves accuracy. While the ECG increases the ability to detect underlying cardiovascular conditions that place athletes at increased risk, ECG as a diagnostic tool has limitations in both sensitivity and specificity. Even if properly interpreted, an ECG will not detect all conditions predisposing to SCD. In addition, the true prevalence of specific ECG parameters in athletes and in diseases that predispose to SCD is often unknown and requires further study. The Seattle Criteria was developed with thoughtful attention to balance sensitivity (disease detection) and specificity (false positives), while maintaining a clear and usable checklist of findings to guide ECG interpretation for physicians, including new learners.

**Conclusion:** -Cardiac adaptation and remodeling from regular athletic training produces common ECG alterations that could be mistaken as abnormal. -The ECG interpretation guidelines presented and the online training program serve as an important foundation for improving the quality of ECG interpretations and the cardiovascular care of athletes. -The interpretation of ECG according to the Seattle Criteria allowed recognizing patients with pathological findings and deriving them for their complete evaluation.