TACSM Abstract

The Effect of Covid-19 on Cardiac Health Investigated by Electrocardiogram in Collegiate Athletes

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ABSTRACT

Covid-19 has emerged as a global pandemic and affected almost every organ of the body. There is limited data on cardiovascular involvement in athletes with covid-19 infection. **PURPOSE**: The purpose of the study is to determine the effect of covid-19 on cardiac health in collegiate athletes by electrocardiogram. **METHODS**: Prior to testing, all subjects signed an Informed Consent approved by the university Institutional Review Board (IRB). Screening electrocardiograms were performed in 45 Covid-19 infected basketball, football and soccer playing athletes (39 males and 6 females) of 18-25 years of age and have since shown to be negative following two successive tests. The data were then compared to ECG values in non-infected basketball, football, and soccer athletes, obtained by conducting meta-analyses with having same age and sport criteria. Descriptive statistics were means and standard deviation (SD). Additional statistical analyses utilized a Factorial ANOVA with main effect, post hoc Tukey and effect size calculations. Statistical significance is set a priori at $P \leq 0.05$. **RESULTS**: The total number of subjects in experimental group were 12 male basketball players, 23 male football players, 4 male soccer players and 6 female Soccer players. The total number of subjects in control group obtained through meta-analyses were 591 male basketball athletes, 176 male footballers, 588 male soccer athletes and 154 female soccer athletes. The baseline characteristics of mean (SD) BMI (kg/m^2) for experimental group was as follows: male basketball: 23.4 (1.77), male football: 31.5 (6.53), male soccer: 23.9 (1.55), and female soccer: 24.5 (4.52). For control groups, BMI were as follows: male basketball: 25, male football: 22.6 (7), male soccer: 23.1 (0.8), and female soccer: 21.8 (0.3). The factorial ANOVA shows that there is a significant difference in ECG parameters between male and females ($p=0.001$) and between sports ($p= 0.000034$) but not between experimental and control group ($p=0.18$). The post hoc Tukey analysis indicated the following: PR interval and QRS duration were significantly ($p=0.006$, $p=0.017$) higher in males compared to females, respectively; PR interval was significantly ($p=0.04$) lower in Soccer players compared to other sports. The resting heart rate (RHR) was significantly ($p=0.01$) higher in the experimental group compared to controls, yet was within normal range of heart rate. While there was not a significant difference between the two groups in the ECG parameters, there was a small to huge effect size in ECG parameters in male and female soccer players. In male soccer players between the groups, the value of Cohen D for RHR was 0.16 (very small effect size), 0.92 (large effect size) for QRS duration and 0.72 (medium effect size) for QTc interval. For the female soccer players, the value of Cohen D for RHR was 1.70 (very large effect size), and 0.67 (medium effect size) for QRS duration. There is a huge effect size in RHR in male football athletes with a Cohen D value of 2.1. **CONCLUSION**: The effect of Covid-19 on ECG parameters is more profound in male athletes compared to female counterparts, primarily in RHR, PR interval and QRS duration. In terms of sports, the male and female soccer players have changes in ECG parameters when compared to male football and basketball athletes.