

Parameters Associated with Abnormal Cardiac Conditions in Adolescent Athletes: Analysis using the Simon's Heart Heartbytes Youth Cardiac Registry

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Abstract

PURPOSE: To determine clinical parameters that are related to abnormal cardiac conditions in the physically active youth.

METHODS: We used the Simon's Heart Heartbytes National Youth Cardiac Registry to collect cardiac related data from middle and high school athletes in southeastern Pennsylvania. We collected age, race/ethnicity, symptoms suggestive of abnormal cardiac conditions, past medical history, medication use, caffeine intake and family history. We also obtained height, weight, blood pressure, and cardiac murmur findings, as well as an ECG in all individuals. Binary logistic regression analysis was performed to identify an independent association between abnormal cardiac symptoms and potential indicators (all collected variables). The odds ratio (OR), 95% confidence interval (95% CI), and p-values were used as critical statistical values.

RESULTS: There were a total of 887 athletes (543 males and 344 females, age=16.9±2.1, height=166.9±11.4, weight=62.0±16.0). There was an independent association between abnormal symptoms and presence of significant past medical history (OR: 4.75, 95%CI: 3.17, 7.10, p=0.001) and prescribed medication use (OR: 1.71, 95%CI: 1.04, 2.79, p=0.034). In the past medical history, young athletes with a previous history of asthma showed greater propensity of abnormal cardiac symptoms (48.9%) compared to young athletes without a previous history of asthma (14.0%, p=0.001). Additionally, young athletes who had a history of anxiety or depression demonstrated higher proportion of abnormal cardiac symptoms (48.9%) than those who do not have any history of anxiety or depression (19.5%, p=0.001). Although the association between the presence of abnormal symptoms and African-American race (OR:2.01, 95%CI: 0.95, 4.28, p=0.069) and average daily consumption of at least 2 types of caffeine drinks (soda, energy drinks, tea, and coffee) (OR:2.11, 95%CI: 0.87, 5.07, p=0.097) were not significant, there was a trend to reach the a priori significance level.

CONCLUSIONS: The current study identified several clinical parameters that are associated with symptoms suggestive of abnormal cardiac conditions. Further research needs to be done on a larger scale to better sort out the clinical history that may contribute to false positives in an effort to reduce false positives at heart screenings.

Introduction

- ❖ An effective method for sports cardiac screening is often debated.
- ❖ Parameters associated with high false positive rates are unknown.
- ❖ Specific medical conditions that lead to further cardiac assessment during pre-participation exams (PPE) are unknown.

Purpose

- ❖ To determine clinical parameters related to abnormal cardiac conditions in the physically active youth.

Methods

Study Design: Cross-sectional

Participants: 887 Young Athletes (543 males, 344 females. Age 16.9±2.1) in SE Pennsylvania as part of the Heartbytes National Cardiac Youth Registry sponsored by Simon's Heart

Outcomes: Symptoms suggestive of abnormal cardiac conditions

Variables examined: age, race/ethnicity, past medical history, medication use, caffeine intake, family history, height, weight, blood pressure, cardiac murmur findings, and ECGs in all individuals.

Data Analysis: Binary logistic regression analysis and chi-square

Results

- ❖ Past medical histories (OR: 4.75; 95%CI: 3.17, 7.10, p=0.001) and prescribed medication use (OR: 1.71; 95%CI: 1.04, 2.79, p=0.034) were associated with abnormal cardiac symptoms.
- ❖ Greater odds, but statistically non-significant abnormal cardiac symptoms were found with African-American race (OR: 2.01; 95%CI: 0.95, 4.28, p=0.069) and more than 2 sources of daily caffeine consumption (OR: 2.11; 95%CI: 0.87, 5.07, p=0.097).

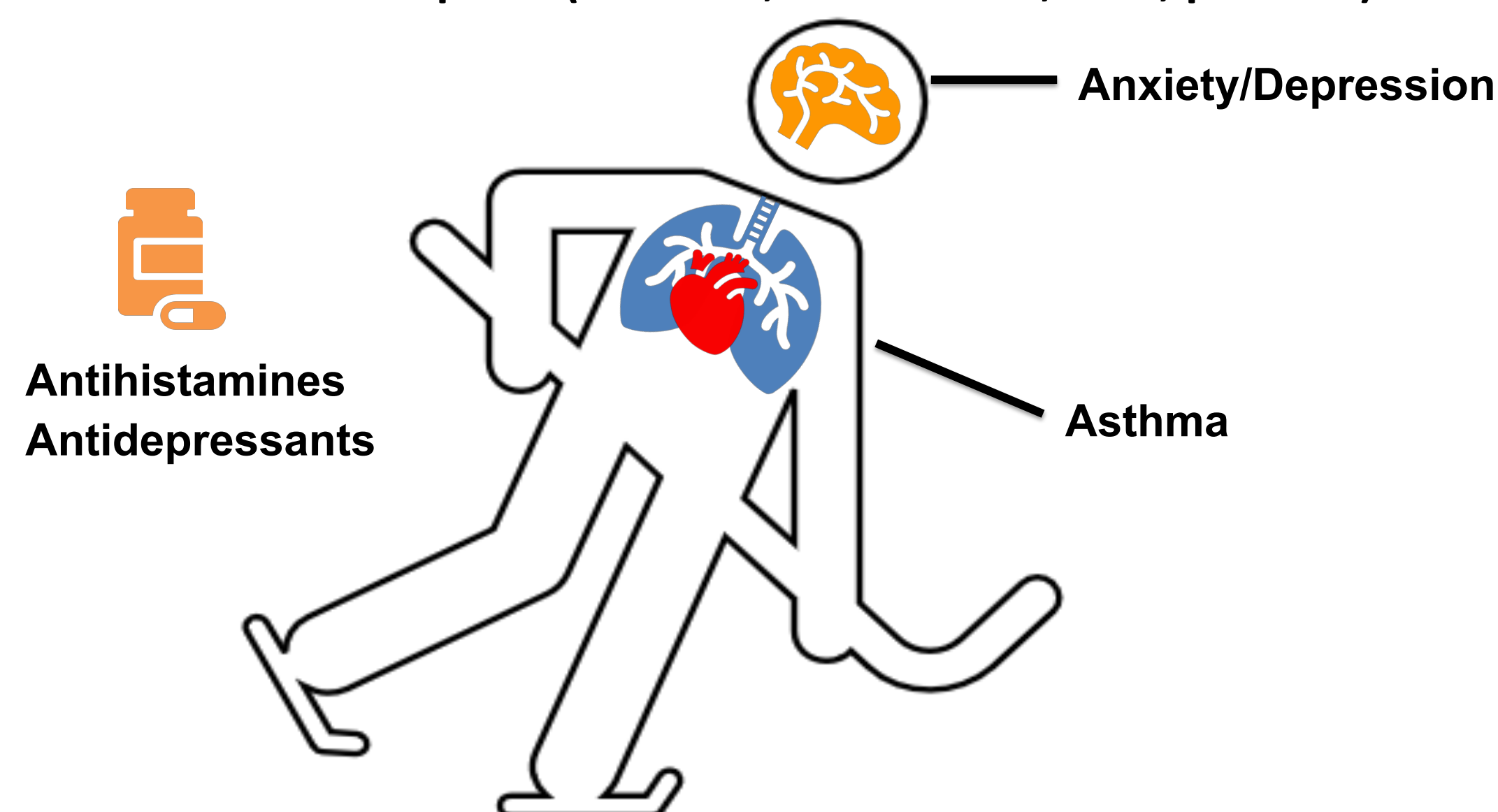
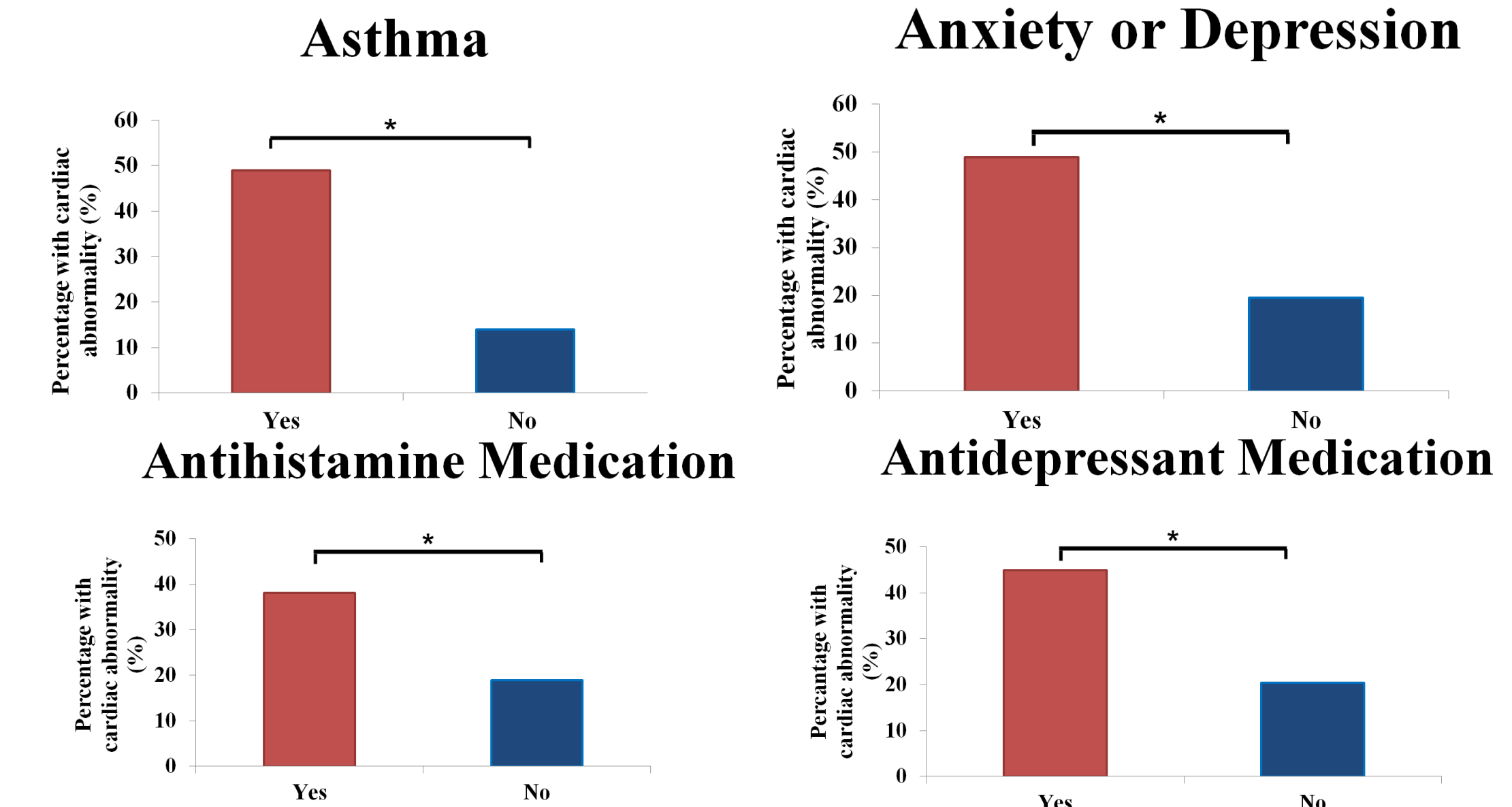


Figure 1. Past medical histories and medication use that are associated with abnormal cardiac symptoms

Results



Figures 2-5. Percentages of athletes with asthma (p=0.001), anxiety/depression (p=0.001), antihistamine usage (p=0.001), and antidepressant usage (p=0.008) based on abnormal cardiac symptoms.

Conclusions

- ❖ Past medical histories of asthma, anxiety, and depression are associated with adolescent athletes experiencing abnormal cardiac symptoms
- ❖ Antidepressant and antihistamine usage are also linked to abnormal cardiac symptoms
- ❖ Due to the increased popularity of energy drinks and other caffeinated beverages, they may play a bigger role than is currently realized in cardiac screenings for athletes.

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