Body Fat Percentage Negatively Correlates with Measures of Aerobic Fitness in NAFLD and Metabolic Syndrome

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BACKGROUND

- NAFLD is one of the leading causes for liver disease globally and is comorbid with metabolic syndrome.
- Cardiorespiratory exercise remains one of the most common methods of treatment.
- VO2max is the maximum amount of oxygen used during exercise.
- It is unclear what the relationship is between metabolic indicators and aerobic fitness.

PURPOSE

- The purpose of this investigation was to understand the relationship between indicators of metabolic dysregulation and measures of aerobic fitness and endurance as represented by VO2max and Aerobic Threshold (AT).

HYPOTHESIS

- This study hypothesizes that indicators of metabolic dysregulation influence fitness performance in patients with one or more symptoms of metabolic syndrome. Factors of metabolic dysregulation, indicated by body fat percentage (Fat%) and body mass index (BMI), will negatively influence VO2max.

METHODS

- BMI was obtained using height and weight measured by physical examination.
- Fat% was determined using bioelectrical impedance.
- BMI and Fat% were selected to be used from the metabolic profile because they are universally used and easily measurable.
- VO2peak was used as a proxy for VO2max given the physical limitations of subjects during testing.
- AT is used as well as VO2peak to measure physiological endurance.
- Both VO2peak and AT were collected during Bruce Treadmill testing where subjects increase intensity over stages and respiration is collected via a gas mask. Measured in mL per kg of bodyweight per minute.
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RESULTS

- For N=55, BMI and Fat% strongly and negatively correlate with VO2peak with values of -.697 and -.658 respectively at a significance level of 0.01.
- BMI and Fat% show a similar but weaker correlation with AT.

CONCLUSIONS

- The negative correlation suggests that the lower a subject’s BMI and BF%, the higher their VO2max.
- Given the data, Body Fat% has a stronger relationship with aerobic fitness than BMI does.
- Future research needs to be done with a larger sample size and more components of the metabolic profile.
- Future research needs to elucidate if Body Fat% has a causative relationship with aerobic fitness.