Body Composition Assessment and Prediction Formulas after Spinal Cord Injury

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INTRODUCTION

There is a high prevalence of obesity after spinal cord injury (SCI). Until recently, assessing body composition for those with SCI has relied on methods that have underestimated the prevalence of obesity and cardiometabolic disease risk.

The purpose of this study was to assess the body composition of individuals with chronic SCI via the criterion standard four-compartment model (4cm). Comparing other methods of body composition and developing a prediction formula for body fat percentage (BF%) were also goals.

METHODS

The 4cm (body density, bone, total body water, and fat) was assessed in 72 men and women with chronic motor complete SCI. Body mass index, hydrostatic weighing (HW), dual-energy x-ray absorptiometry (DXA), bioelectrical impedance analysis, BodPodO, and 9-site skinfold measures were tested for comparison with the 4cm and to determine regression equations. International Diabetes Foundation metabolic syndrome prevalence was also determined.

RESULTS

The obesity prevalence using the 4cm was 97%, and metabolic syndrome prevalence was 59.4%. The mean BF% was highest with the 4cm (42.4±8.6%). HW (0.910; $p<0.0001$) and DXA (0.845; $p<0.0001$) had the highest correlations with the 4cm regarding %BF. The simplest regression equation was determined to be:
%BF = 23.484 + 0.118 (age) – 10.725 (sex) + 0.181 (weight) + 0.141 (AbdomenSF)
Men = 1; Women = 0

CONCLUSION

Obesity is at epidemic proportions in the SCI population. DXA and HW were shown to have a strong correlation with 4 cm, and the developed equation for BF% after SCI may be helpful for clinicians without expensive technology-based equipment.