Body composition Assessment of Children With and Without Down Syndrome in Alkhobar

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Introduction

Down syndrome (DS) is a well-known genetic disorder that causes intellectual and developmental disabilities. Undesirable weight gain, unfavorable dietary habits and difference in body composition are common health issues of DS. Higher body fat mass and lower fat-free mass were observed among DS children and adolescents compared with their counterparts. (1)

The objective of this study is to assess the difference in body composition among children with and without down syndrome.

Methods and Materials

This case-control study was conducted on Thirty-two children with DS (16 females/16 males, ages 5–12 years) from different schools and centers in Khobar compared to 48 gender- and age-matched non-DS control group (31 females/18 males). Subjects with mental disabilities or genetic disorders other than DS and who receive medications and/or undergo special diet that influence body weight or food intake were excluded from the study. The protocol was approved by Institutional Review Board of Imam Abdulrahman bin Faisal University in Dammam, Saudi Arabia and signed parental consent was obtained before subject participation.

Anthropometric measurements:

Height was recorded as the average of three measurements using a stadiometer. Weight, fat mass and fat-free mass were measured using mechanical beam scale (Tanita SC-331S). Participants were asked to remove their shoes, heavy clothes and accessories to obtain an accurate measurement. Waist circumference was measured using stretch-resistant tape at the midpoint lower rib margin and iliac crest. Hip circumference was measured at the largest circumference of the buttocks. Waist to height ratio (WCtoH), waist-hip ratio (WCtoHC) were calculated.

Results

This study shows significant difference in body composition between Down syndrome children and non-Down syndrome as shown in figure 1A-B, 2A-B. Height showed significant difference in both groups male and female as shown in figures 1A-2A. No difference was observed in weight. Fat mass and fat free mass was the same in male group. Moreover, female group showed difference in fat mass (p<0.056) as mentioned in other studies that female have higher fat mass (2)(3). In WC and HC both groups shows significant difference male (0.024) female (0.005). Finally, in figures 18, 28 there is significant difference (0.0000) between cases and control in both groups for the ratio between height to waist circumference.

Discussion

Conclusions

Up to our knowledge this study was the first study conduct in Saudi Arabia that use waist height ratio in the assessment of body composition in DS children. Interestingly, highly significant results were observed between DS children and non DS children leading to the conclusion that children with DS had higher waist height ratio. In addition, female with Down syndrome show high fat mass in their body compared to non DS children. Assessment of the dietary pattern and consumption including the physical activity to know the reason for the difference in body composition is under investigation.

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References