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Impact of Adiposity on Physical Activity Levels of Young Infants

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ABSTRACT

Studies suggest that infant adiposity may delay the development of motor skills such as sitting.[1-3] However, the role of physical activity (PA) in the development of motor skills during the first year of life has been understudied and little is known about the amount of PA needed for normal growth and development in infants.[4,5]
PURPOSE: The purpose of this study was to examine the impact of adiposity as measured by subscapular skinfold thickness (SFT) on PA of typically developing infants at three months of age (visit 1), onset of sitting (visit 2) (M=5 months, 8 days), and one month post (visit 3) (M=6 months, 3 days).
METHODS: Infants' (n=29) subscapular SFT was measured by a trained researcher and infants wore accelerometers on their left wrist and ankle for four consecutive days at all three time points.
RESULTS: While normal SFT infants appeared to move more in visits 1 and 2 compared to high SFT infants, these results were not significant.
DISCUSSION: More research is needed to determine if a significant difference develops during the acquisition of additional motor skills.

INTRODUCTION

Physical activity (PA) is an important component for health and well-being at any age; however, it is crucial for young children's development. For infants (under one year of age) PA can help develop motor skills, support brain development, and has been linked to lower skinfold thickness. This is especially important since high adiposity in infants may delay the achievement of motor skill milestones such as sitting and standing; key milestones that allow infants to better explore the world around them.[2] The first six months of life represent a critical time period for the prevention of obesity. For example, weight increases during the first six months of life have been associated with increased risk for obesity at age 3, thus increasing their odds of being an obese adult. [7] However, minimal research has explored the relationship between adiposity and PA levels. To ensure young children, especially those at-risk for obesity, are developing healthy PA behaviors the relationship between PA and adiposity needs to be evaluated. Therefore, the purpose of this study was to examine the impact of adiposity as measured by subscapular skinfold thickness (SFT) on PA of typically developing infants at three months of age, onset of sitting, and one month post onset of sitting.

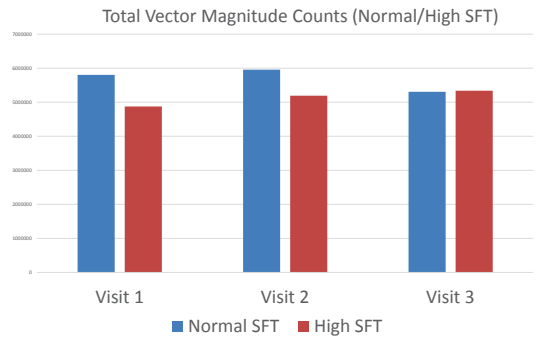
METHODS

- Twenty-nine infants (n=8 high SFT, n=21 lower SFT) (n=8 females, n=21 males) participated in a pilot study examining the relationship between infant PA and postural control in normal weight and overweight infants.
- High SFT was classified as having a subscapular measurement in the 85th percentile or above (≥9.2 mm/males, ≥9.5mm/females) according to the WHO age and sex-specific standards at their first visit.[6]
- Infant PA was measured using Actigraph GT9X Link accelerometers on the left wrist and ankle for four consecutive days at each of the three time points.
    - Visit 1 = 3 months of age
    - Visit 2 = onset of sitting (M=5 months, 8 days)
    - Visit 3 = one month post (M=6 months, 3 days)
- Participants receive a $25 gift card/visit for participating.
- The PA outcome variable was the total vector magnitude count (TVMC) from ankle and wrist accelerometer.
- Data were analyzed using a repeated analysis of variance and a three way ANOVA to examine the effect of sex, gender, and SFT class (i.e., high vs lower) on TVMC.

RESULTS

- At visit 1 the normal SFT infants PA was higher (5804333.70 ± 2385471.84) than high SFT infants (4874878.79 ± 161.6890.01) however this was not statistically significant (p=.174).
- At visit 2 the normal SFT infants PA was higher (5956577.283 ± 2022466.160) than the high SFT infants (5192336.793 ± 1847272.95) however this was not statistically significant (p=.201).
- At visit 3 the high SFT infants PA was slightly higher (5339474.920 ± 2457494.267) than the normal SFT infants (5306746.836 ± 2457494.27 however this was not statistically significant (p=.965).
- A repeated measures ANOVA with a Greenhouse-Geisser correction determined there were no statistically significant differences in mean TVMC between time points F(2.0, 46.0)=.227, p <0.798).
- Additional three-way ANOVA revealed no significant main effects and interaction effects on Gender × SFT × Visit (ES=.002).

RESULTS CONTINUED



DISCUSSION

Although no significant results were found when comparing high SFT and normal SFT, normal SFT infants appeared to have higher PA at visits 1 and 2. More research is needed to determine if these differences impact the rate at which infants reach motor milestones. Future research could consider assessing other measures of SFT such as tricep or quadricep thickness as well as abdominal circumference. Additionally, further research could assess infants as they continue to age to determine if there are differences between PA at the onset of other milestones such as standing and walking.

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