Assessment of 24 Hour Activity Patterns in Patients with Bardet-Biedl Syndrome

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Background: Obesity is a common feature of Bardet-Biedel Syndrome (BBS) and impacts health and wellbeing for both BBS patients and their families. Activity patterns, including physical activity and sleep behavior, play complex roles in energy balance and, consequently, are important components in weight management. Currently, little is known about physical activity and sleep behavior in people with BBS. This study characterizes objectively assessed 24-hour activity patterns in the BBS population.

Methods: We recruited 154 participants with BBS via the Clinical Registry Investigating Bardet-Biedl Syndrome. Participants received wrist-worn triaxial accelerometers by mail to track activity and sleep patterns over 12 consecutive days. Analyses compared percentage of participants' awake time spent engaging in moderate to vigorous activity, light activity, and sedentary time by BBS genotype and age. Further analyses assessed occurrence and frequency of nighttime activity and its relation to daytime activity.

Results: Percentage of awake time spent engaging in moderate to vigorous activity, light activity, and sedentary time, did not significantly differ by BBS genotypes, but did differ significantly by age. Sedentary time increased with age while moderate to vigorous activity decreased. Nighttime activity occurred in about two thirds of the cohort. Frequency of nighttime activity is positively correlated with the percentage of awake time spent sedentary. Those engaging in zero bouts of nighttime activity, one to three bouts, four to six bouts, and seven or more bouts spent 58%, 59%, 63%, and 75% of their day sedentary, respectively. Moderate to vigorous and light activity time both decreased in accordance.

Conclusions: This study presents novel information about activity patterns among people with BBS. Sedentary time and sleep quality, including bouts of nighttime activity, are related, and understanding if there are causal pathways between these behaviors can guide the design of future weight management interventions.