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Time course of exercise induced alterations in daily activity in chronic fatigue syndrome

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Abstract

In a previous study we demonstrated that while people with CFS had lower daily activity levels than control subjects, they were able to increase daily activity via a daily walking program. We reanalyzed our data to determine the time course of activity changes during the walking program. Daily activity assessed via an accelometer worn at the hip was divided into sleep, active, and walking periods. Over the first 4–10 days of walking the subjects with CFS were able to reach the prescribed activity goals each day. After this time, walking and total activity counts decreased. Sedentary controls subjects were able to maintain their daily walking and total activity goals throughout the 4 weeks. Unlike our previous interpretation of the data, we feel this new analysis suggests that CFS patients may develop exercise intolerance as demonstrated by reduced total activity after 4–10 days. The inability to sustain target activity levels, associated with pronounced worsening of symptomology, suggests the subjects with CFS had reached their activity limit.

We have previously published data suggesting that individuals with chronic fatigue syndrome (CFS) could increase their total daily physical activity over a period of four weeks [1]. Six individuals with CFS were prescribed a daily walking program ranging from 15–25 minutes per day with the hopes of increasing their daily activity to a level approximating that of a healthy sedentary person. Daily activity was measured by an accelometer worn at the waist [1]. We found that while our CFS subjects were able to increase their daily activity, they were unable to reach daily levels similar to sedentary controls. Unlike previous studies, our daily exercise program was accompanied by a worsening of CFS symptomology. Overall mood, daily fatigue, and time spent each day with fatigue all worsened over the course of four weeks as the exercise program progressed. Based upon the observation that our most "active" CFS subjects were the least able to increase their daily activity, we proposed a "daily activity limit" as a possible explanation for the worsening of fatigue related symptoms and the inability to reach activity levels of sedentary controls.

In order to further examine the idea of a "daily activity limit" a detailed analysis of each subject's activity each day was performed. Daily activity was broken into 3 categories – exercise, active, and sleep based upon activity per minute and time of day. Four of the six subjects appeared to perform a single bout of exercise each day, and were chosen for further analysis. When daily activity data was viewed in this manner, a distinct pattern was observed. During the first 4–10 (average of 7) days of exercise, our CFS subjects spent, on average, approximately 23 minutes each day exercising. This indicates that the subjects were not only complying with the prescribed exercise, but also