Abstract

Background

People with neurological conditions that impair mobility such as multiple sclerosis (MS) have low levels of physical activity, with walking their primary form of exercise. When the San Francisco Bay Area shelter-in-place order was announced in mid-March 2020 to flatten the curve of SARS-CoV-2 infections, the abrupt closure of gyms, fitness studios, and malls greatly limited options for safe exercise. We leveraged an ongoing study utilizing wearable technology, to understand the impact of the pandemic and the shelter-in-place policy on physical activity in people with MS (PwMS) at-risk for neurological worsening.

Objectives

To test the hypothesis that the average daily step count (STEPS) in people with MS would decrease due to the COVID-19 shelter-in-place order.

Methods

Average daily step count (STEPS) was measured from a large UCSF MS Center cohort of PwMS using a wrist-worn accelerometer (Fitbit Flex2) as previously detailed. STEPS before and after the shelter-in-place were available for 42 participants. Amount, type and frequency of exercise, as well as fatigue (Modified Fatigue Index; MFIS-5) and mental health (Mental Health Inventory; MHI-5) were assessed via questionnaire. The UCSF Institutional Review Board approved the study protocol. Descriptive statistics and pre-post comparisons using Wilcoxon Signed-rank were performed, and figures generated, using R studio.

Results

A decrease in STEPS was observed during the week (p =0.024), and month (p=0.048) after versus before the shelter-in-place order in 42 participants with valid STEPS data during this time period. Individual data showed marked decreases in STEPS the week immediately post shelter-in-place, yet some recovered to near pre shelter-in-place levels. As a group, this rebound was not significant. No significant difference comparing 2019 and 2020 similar epoch STEPS data was observed for these participants.

Conclusions

The data supported the hypothesis that physical activity would be reduced in people with MS due to the COVID-19 activated shelter-in-place. Overall prolongation of reduced activity is troubling, particularly in a population where low activity is already pervasive due to detrimental secondary effects of inactivity. These observations were made
possible by the use of remote activity monitoring and aligns with broader efforts to use wearables to track and promote physical activity, augment telehealth, and improve telerehabilitation across populations with chronic neurological disorders.