Association Between Neighborhood Walkability and Physical Activity in Urban and Suburban Chronic Hemodialysis Populations

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Introduction and Aims

In an effort to combat chronic sedentary behavior in both healthy and chronically ill populations, the concept of neighborhood walkability, or how conducive to walking a neighborhood is, has been explored. Although increased neighborhood walkability has been negatively associated with body mass index (BMI) and prevalence of diabetes (DM), the relationship between walkability and objectively measured physical activity has not yet been examined [1]. We hypothesized that neighborhood walkability and physical activity, as measured by daily steps walked, are positively correlated. Our aim was to test this hypothesis by studying urban and suburban hemodialysis (HD) populations.

Methods

Daily steps walked was measured in HD patients from New York City, NY (NYC), an urban environment, and Baton Rouge, LA (BR), a suburban environment, over the course of 5 weeks with the Fitbit Flex (Fitbit, San Francisco, CA) [2,3]. Participants' residence zip codes were collected and used to calculate a walk score via www.walkscore.com. The walk scores range from zero (very poor walkability) to 100 ('walker's paradise"). Additional parameters collected included age, race, gender, HD vintage, BMI, and presence of DM and congestive heart failure (CHF). Parametric and non-parametric linear correlation and regression analyses were performed to examine the association between daily average steps (dependent variable) and walk score in the total population and per city. Patients were stratified in 2 groups by median walk score and these groups were compared by t-test.

Results

We studied 46 patients, 29 from BR and 17 from NYC. The demographics of our study cohort were as follows: age 53±13 years, 76% black, 50% male, dialysis vintage 5.5±3.5 years, BMI 31.1±8.5 kg/m^2, 46% DM, and 24% CHF. Walk scores ranged from 0 to 100, with a median of 28. On average BR patients walked 5,290 steps/day and patient in NYC 8,274 steps/day (p=0.0175). Both parametric (R=0.425; p=0.0032) and non-parametric analysis (R=0.359, p=0.0143) indicated a positive correlation between walk score and steps/day (**Figure 1**). Steps walked per day were less in neighborhoods with a walk score <28 (4,800±2,229) compared to neighborhoods with a walk score ≥ 28 (7,514±3,900; p=0.0047).

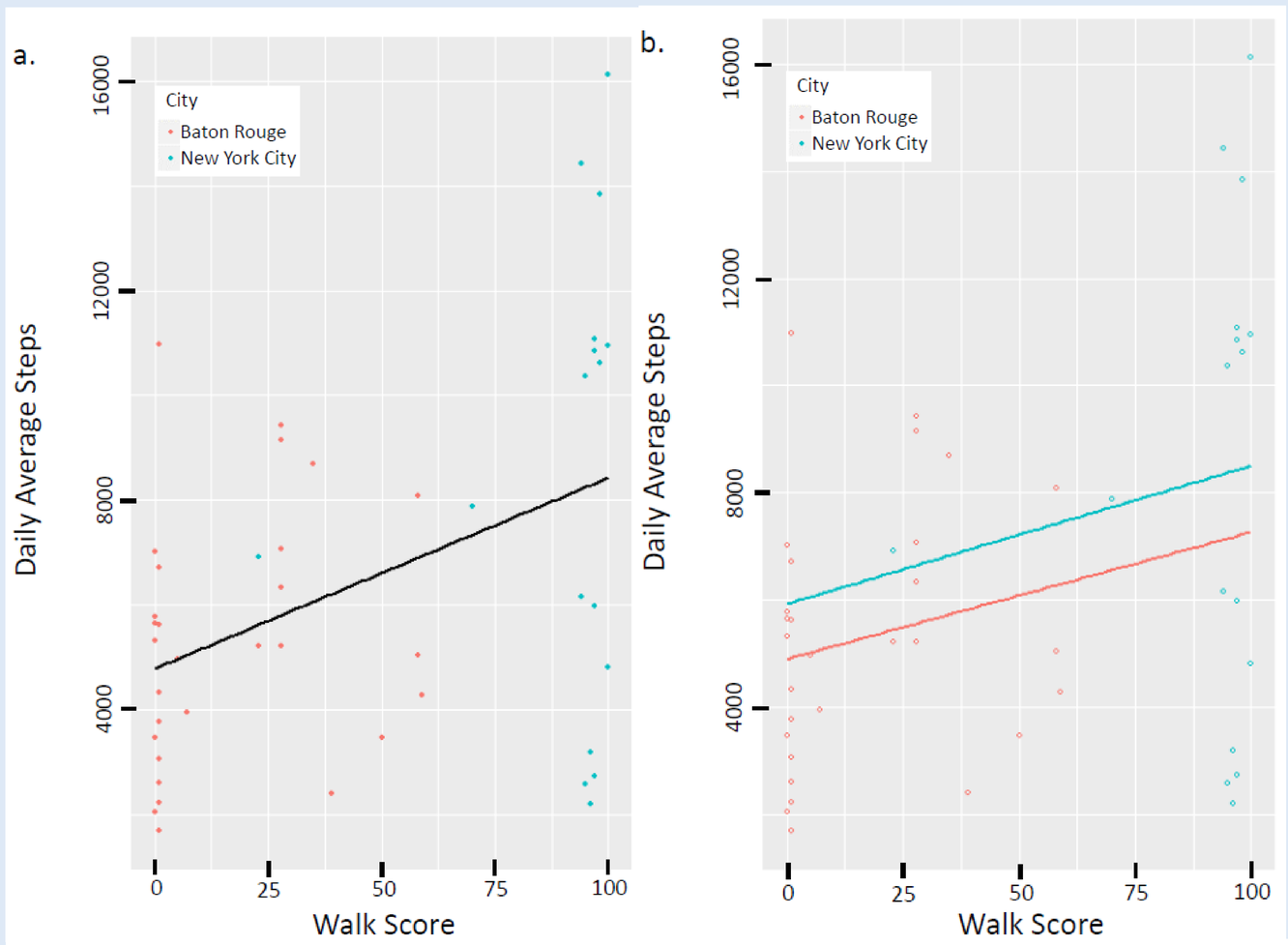

Figure 1. Linear Regression of walk score vs daily average steps.
a) Combined Baton Rouge & New York City. Line of best fit: Steps/day = 37 * Walk Score + 4,781
b) Separated Baton Rouge and New York City:
NYC line of best fit: Steps/day = 26 * Walk Score + 5,924;
BR line of best fit: Steps/day = 24 * Walk Score + 4,895

Conclusions

This study in urban and suburban HD patients corroborated the original hypothesis of a positive association between walk score and average daily steps walked. To our knowledge, this is the first time an association between walk score and objective measurement of physical activity in the HD setting has been established. In order to delineate the effect of walk score on physical activity, more patient data need to be collected to allow for multivariate analysis.

References:

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