Social Disconnectedness and Hypertension in Late Life

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Abstract

Social isolation has been linked to a host of aging related disease and old age mortality. It remains to be determined how specific characteristics of social connections may jointly or differentially affect risk of physiological dysregulation in older adults. Using data from over 2,000 respondents aged 57-85 from the National Social Life, Health and Aging Project (2005-06), this study examines the relationships between systolic blood pressure and three dimensions of social connections. The results show significant increments in risk of hypertension in association with objective and quantitative characteristics of social networks as measured by social disconnectedness but not subjective and qualitative aspects of social relations as measured by perceived social stress or perceived isolation. There may also be sex differences in these associations, with men being more affected by mere absence of networks and women being more affected by lack of social participation.

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Extended Abstract

INTRODUCTION

Social relationships have long been believed to affect social and physical functioning and survival across social species. A large body of previous research documents that social integration and supportive relationships are beneficial to health and well-being because they help individuals cope with stress and meet daily challenges of social life. Social isolation or a lack of social network embeddedness, on the other hand, has been found to be associated with cardiovascular disease, depression, infection, and higher rates of morbidity and mortality. Along this line of research, different studies utilize a wide variety of indicators of social relations that go under the broad umbrella of social support. Most previous research is also restricted to single characteristics of social relationship networks such as social network size. There is a lack of simultaneous assessment of both objective and subjective, quantitative and qualitative, structural and functional aspects of social relation and support. As a result, it is unknown whether multiple features of social isolation may combine to create a particularly dire situation for individuals and whether particular aspects of social isolation have differential effects on health.

Research also indicates that social integration and support may be particularly important to health as individuals age, as older adults transition into different social roles and experience more stressful life events such as loss of spouse or friends. The role of social relationship characteristics remains to be better understood, however, in objective measures of physical health in late life. Systolic blood pressure is of particular interest because of the high prevalence of hypertension among older adults and because hypertensive individuals are at increased risk for cardiovascular disease, heart attack, stroke, and kidney disease, all of which are strongly predictive of old age mortality.

Using data from a nationally representative sample of older adults in the U.S., this study examines the relationships between systolic blood pressure and three dimensions of social connections: perceived social stress, social disconnectedness, and perceived social isolation. We also assess whether there are gender differences in these associations.

DATA AND METHODS

The data are from the National Social Life, Health and Aging Project (NSHAP), a nationally-representative study of community-dwelling older adults aged 57-85 years in 2005 – 2006 in the U.S. In addition to the in-person interviews, the NSHAP also includes several biomarkers for a subset of the sample. This study includes 2,283 individuals who had available data for variables used in the analysis.

Systolic blood pressure (SBP) was operationalized as an ordinal variable with five categories according to clinical guidelines: hypotension (<90 mm Hg), normal (90-120 mm Hg), pre-hypertension (120-140 mm Hg), stage 1 hypertension (140-160 mm Hg), and stage 2 hypertension (160+ mm Hg). Using confirmatory factor analysis and results from previous research by Cornwell and Waite (2009), we constructed two scales. The *Social Disconnectedness* scale (SDS) consists of two factors: lack of social network and lack of social participation. The social network factor is comprised of four measures: social network size, network range, proportion of network members in the household, and average frequency of contact with network members. The social participation factor is comprised of four other variables: number of friends, frequency of attending organized meetings, frequency of socializing, and frequency of volunteering. The *Perceived Isolation* scale (PIS) consists of three factors: perceived lack of friend and family support (how often can open up to friends, rely on friends, open up to family, and rely on family), perceived lack of spousal support (how often can open up to spouse, and rely on spouse), and loneliness (how often feels lacking companionship, feels isolated, and feels left out). We adopted the *Perceived Social Stress* (PSS)

scale from the NSHAP based on Cohen et al. (1983) that consists four items assessing how often the respondent felt unable to control important things in life, did not feel confident about the ability to handle personal problems, felt things were going his/her way, and felt difficulties were piling up beyond control. Other covariates in the analysis include sex, age, race/ethnicity, education, body mass index, level of physical activity, smoking status, and medication use.

We estimated ordinal logit regression models to examine the associations between SBP and SDS, PIS, and PSS, respectively, adjusting for other covariates in a stepwise fashion. In all analyses, we estimated models for the entire sample and by sex to allow for comparisons of sex differences in the associations. All statistical analyses were performed using Stata 10.0 and adjusted for survey design effects using sampling weights.

RESULTS AND FINDINGS

The SDS that measures the objective, quantitative, and structural dimension of social relations is strongly and significantly associated with SBP. Estimates of odds ratios (ORs) based on the full sample show that the lack of social network and lack of social participation are associated with a 12.4% increase (95% CI, 0.99-1.27; $p<.05$) and 14.5% increase (95% CI, 1.05-1.25; $p<.05$), respectively, in the risk of elevated SBP, adjusting for age, sex, and race. The combined SDS has a highly significant and positive association with SBP that is twice as large as each individual component, with an OR of 1.29 (95% CI, 1.11-1.50; $p<.001$). And these associations remain in magnitude and significance level after the adjustment for the full set of covariates. While the ORs associated with the SDS are significant in both the male and female samples, there seem to be sex differences in the two subscales. Lack of social network has a significant association with SBP for men (OR = 1.22; 95% CI, 1.02-1.46; $p<.01$) but not women; whereas lack of social participation has a significant association with SBP for women (OR = 1.22; 95% CI, 1.08-1.37; $p<.001$) but not men.

The PIS measures subjective, qualitative, and functional dimensions of social relationship, which have been held as important in the understanding of health consequences of social affiliations. But previous studies are mainly based on self-reported health outcomes instead of biomarkers. Our analysis shows no statistically significant association between SBP with PIS or any of its subcomponents in any models. Similarly, perceived stress as measured by the Cohen PSS scale does not appear to have any significant association with SBP for the full sample, males, or females even in bivariate analysis.

In sum, this study assessed how hypertension, a major marker of physiological stress response, is related to multiple facets of social relations. We find significant increments in risk of high SBP associated with social disconnectedness among older adults. Although previous research has already shown the harmful effects of social disconnectedness as measured by a small social network size, our study extends the evidence to the full range of network characteristics that includes both the lack of social network and social participation in networks. We also find that different dimensions of social disconnectedness affect men and women differently, with men being more affected by the mere absence of network ties and women being more affected by less frequent involvement with network ties. This is consistent with previous research that shows that the largest gender differences in social affiliative behaviors are in seeking and using social support, with women being more likely to be engaged in their social networks and benefit from social support. Our study failed to find support for a significant link between perceived social isolation and hypertension under any circumstances. This is not entirely unexpected given a recently published study that shows social network size is more significantly related to disease and mortality than perceived support. Our study provides new evidence for the relative importance of the objective and subjective dimensions of social relations in association with hypertension in late life.