Social Science & Medicine 97 (2013) 49–55

Contents lists available at ScienceDirect

Social Science & Medicine

journal homepage: www.elsevier.com/locate/socscimed

Perceived neighborhood social cohesion and stroke

Eric S. Kim*, Nansook Park, Christopher Peterson

Department of Psychology, University of Michigan, 530 Church Street, Ann Arbor, MI 48109-1043, USA

ARTICLE INFO

Article history:
Available online 24 August 2013

Keywords:
United States
Stroke
Epidemiology
Public health
Neighborhood social cohesion
Health psychology
Positive psychology

ABSTRACT

Research in the last three decades has shown that negative neighborhood factors such as neighborhood violence, noise, traffic, litter, low neighborhood socioeconomic status, and poor air quality increase the risk of poor health. Fewer studies have examined the potential protective effect that neighborhood factors can have on health, particularly stroke. We examined whether higher perceived neighborhood social cohesion was associated with lower stroke incidence after adjusting for traditional risk and psychological factors that have been linked with stroke risk. Prospective data from the Health and Retirement Study—a nationally representative panel study of American adults over the age of 50—were used. Analyses were conducted on a subset of 6740 adults who were stroke-free at baseline. Analyses adjusted for chronic illnesses and relevant sociodemographic, behavioral, and psychosocial factors. Over a four-year follow-up, higher perceived neighborhood social cohesion was associated with a lower risk of stroke. Each standard deviation increase in perceived neighborhood social cohesion was associated with a multivariate-adjusted odds ratio (O.R.) of 0.85 for stroke incidence (95% CI, 0.75–0.97, $p < 0.05$). The effect of perceived neighborhood social cohesion remained significant after adjusting for a comprehensive set of risk factors. Therefore, perceived neighborhood social cohesion plays an important role in protecting against stroke.

Introduction

Perceived neighborhood social cohesion and stroke

Research in the last three decades has examined how neighborhood-level effects impact health (Diez Roux & Mair, 2010). Most of this research has focused on the increased risk associated with negative neighborhood factors such as violence, noise, traffic, litter, low neighborhood socioeconomic status, and poor air quality (Aslanyan, Weir, Lees, Reid, & McInnes, 2003; Brown, Guy, & Broad, 2005; Diez Roux, Kershaw, & Lisabeth, 2008; Kapral, Wang, Mamdani, & Tu, 2002; Lisabeth, Diez Roux, Escobar, Smith, & Morgenstern, 2007; Menec, Shooshtari, Nowicki, & Fournier, 2010). Few studies have examined how positive neighborhood assets might enhance good health and deter chronic diseases (Diez Roux & Mair, 2010).

Chronic diseases cause an enormous amount of social, financial, and personal burden. As researchers continue examining the links between neighborhood factors and physical health, the search for factors linked with disease onset intensifies. The logic behind this search is, that the identification of such factors may lead to innovative prevention and treatment efforts. One condition, stroke, is especially burdensome for the U.S. health care system. Stroke is a leading cause of disability in the United States and responsible for an estimated $25.2 billion in direct costs (Roger et al., 2011). The prevalence of stroke among U.S. adults is roughly 7 million, with approximately 795,000 new cases reported annually (Roger et al., 2011). Because the risk for stroke increases with age, the identification of health-promoting constructs is particularly important for the growing segment of older American adults facing the dual threat of declining health and rising health care costs.

One recent study examined the relationship between neighborhood social cohesion and stroke (Clark et al., 2011). Neighborhood social cohesion is the perceived degree of connectedness between and among neighbors and their willingness to intervene for the common good (McNeill, Kreuter, & Subramanian, 2006). The construct is distinct from social network data because it describes an entire community and all of its residents (Diez Roux et al., 2008). In a sample of 5789 older adults (all over the age of 65) drawn from three bordering neighborhoods in south Chicago, Clark et al. (2011) found that higher neighborhood social cohesion was associated with a lower risk of stroke death. Each unit increase in neighborhood social cohesion was associated with a 53% reduced stroke mortality risk, even after adjusting for relevant covariates.

* Corresponding author.
E-mail address: kimeric@umich.edu (E.S. Kim).

0277-9536/$ – see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.socscimed.2013.08.001

We built upon this important study by using a nationally representative sample and controlled for an extensive list of covariates. In their limitation section, Clark et al. (2011) discussed how their aggregated neighborhood-level measure of social cohesion had poor agreement among inhabitants of the same neighborhood. Thus, it is important to also measure individual-level perception of neighborhood social cohesion and its relationship to health. Therefore, compared to the previous study (Clark et al., 2011), which used an aggregated group indicator of neighborhood social cohesion, perceived neighborhood social cohesion was analyzed at the individual-level in the current study.

Previous studies have shown that several psychosocial factors are linked to stroke as risk or protective factors. These psychological factors include: anxiety, cynical hostility, depression, negative affect, optimism, and positive affect (André-Petersson, Engström, Hedblad, Janzon, & Rosvall, 2007; Everson et al., 1999; Hamer, Kivimaki, Stamatakis, & Batty, 2012; Kim, Park, & Peterson, 2011; Nabi et al., 2010; Ostir, Markides, Peek, & Goodwin, 2001; Pan, Sun, Okereke, Rexrode, & Hu, 2011; Peterson & Kim, 2011; Rutledge et al., 2008). Therefore, we controlled for these factors. Additionally, we addressed possible concerns that self-reported perceptions of neighborhood-level social cohesion might have been confounded by individual-level social engagement (e.g., people with higher individual social engagement may report greater neighborhood-level social cohesion), by using two measures of individual-level social engagement in the analyses as covariates. In order to examine the unique relationship between perceived neighborhood social cohesion and stroke, these eight psychosocial factors were controlled for in our analyses. We also added each respondent's total wealth as a covariate to roughly tease out whether a respondent's perception of neighborhood social cohesion reflected the overall wealth of the neighborhood.

The aim of this study was to examine whether perceived neighborhood social cohesion showed a protective effect above and beyond traditional risk factors and psychosocial factors linked with stroke risk. We hypothesized that even after adjusting for traditional risk factors, individual-level psychological characteristics, and individual-level social engagement, the association between perceived neighborhood social cohesion and lower stroke incidence would remain. We examined this question using stroke-free individuals in the Health and Retirement Study, which has a prospective cohort design and is nationally representative of U.S. adults over the age of 50.

Method

Study population

The Health and Retirement Study (HRS) is a nationally representative and prospective panel study that surveys more than 22,000 Americans, aged 50 and older, every two years (Wallace & Herzog, 1995). Data have been collected since 1992. In 2006, the HRS added a detailed module that assessed several psychological factors for the first time. Thus, we considered 2006 (the eighth wave) as our baseline and used psychological and covariate data collected in that wave, along with occurrences of stroke collected in the ninth wave (2008), tenth wave (2010), and during exit interviews. For respondents who had died, knowledgeable informants completed exit interviews and specified the respondent's cause of death. The University of Michigan's Institute for Social Research is responsible for the study and provides extensive documentation about the protocol, instrumentation, sampling strategy, and statistical weighting procedures (Wallace & Herzog, 1995). Because this study used de-identified, publicly available data, the Institutional Review Board at the University of Michigan exempted it from review.

Table 1
Distribution of risk factors ($n = 6740$).

Measure	Mean/Count	%	Standard deviation	Range
Age	68.78		9.84	53–105
Female	3929	58.29		
Chronic illnesses	1.77		1.23	0–6
Married status	4387	65.08		
Education				
< High school	888	18.56		
High school	3085	55.03		
≥ College	1599	26.41		
Total wealth				
1st Quintile	807	15.93		
2nd Quintile	1028	18.76		
3rd Quintile	1220	21.51		
4th Quintile	1252	22.76		
5th Quintile	1265	22.04		
Smoking status				
Never	2448	44.43		
Former	2433	43.14		
Current Smoker	691	12.42		
Exercise				
Never	3381	62.24		
Low	829	14.45		
Moderate	1209	20.64		
High	153	2.67		
Alcohol frequency (days/week)				
Never	3236	48.05		
<1	1223	18.16		
1–2	1072	15.92		
3–6	645	9.58		
7	564	8.30		

In 2006, approximately 50% of HRS respondents were visited for an enhanced face-to-face interview. At the end of the interview, these respondents received a leave-behind psychosocial questionnaire that they completed and mailed to the University of Michigan. The response rate was 90%. A total of 7169 individuals were eligible for HRS at baseline. We excluded 428 individuals with a self-reported history of stroke at baseline, resulting in a final sample of 6740 respondents. We present demographic characteristics of study participants in Table 1.

Measures

Self-reported health measures used in HRS have been rigorously assessed (Wallace & Herzog, 1995). Self-reported health conditions have also shown substantial agreement with both administrative claims and medical records (Okura, Urban, Mahoney, Jacobsen, & Rodeheffer, 2004).

Stroke outcome measurement

We defined stroke incidence as a first nonfatal or fatal stroke based on self-report or proxy-report of a physician diagnosis using 2008, 2010, and exit survey data. Transient ischemic attacks were not categorized as strokes because their symptoms are fleeting and usually not conceptualized in incidence studies as full strokes.

The validity of self-reported stroke as an accurate estimate of stroke incidence has been well documented (Engstad, Bonaa, & Viitanen, 2000; Glymour & Avendano, 2009; Okura et al., 2004). Studies find substantial agreement between self-reported strokes and hospital records (Okura et al., 2004). A large-scale study reported that a self-reported stroke measure showed a positive predictive value of 79%, with an estimated sensitivity of 80%, and specificity of over 99% (Engstad et al., 2000). Furthermore, a previous study using HRS data confirmed that self-reported stroke is