

Research report

Low HDL cholesterol is associated with suicide attempt among young healthy women: the Third National Health and Nutrition Examination Survey

Jian Zhang^{a,b,*}, Robert E. McKeown^b, James R. Hussey^b, Shirley J. Thompson^b,
John R. Woods^{c,d}, Barbara E. Ainsworth^{b,e}

^a Division of Health and Family Studies, Institute for Families in Society, University of South Carolina, United States

^b Department of Epidemiology and Biostatistics, Arnold School of Public Health, University of South Carolina, United States

^c Center for Health Services and Policy Research, Arnold School of Public Health, University of South Carolina, United States

^d Department of Family and Preventive Medicine, School of Medicine, University of South Carolina, Columbia, SC, United States

^e Department of Exercise and Nutritional Sciences, San Diego State University, United States

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Abstract

Background: Serum cholesterol is reported to be associated with suicidality, but studies conducted among general healthy population are rare. We examined the association between serum cholesterol and suicidality in a national sample of the general population of US.

Methods: We used the data of 3237 adults aged 17 to 39 years, who completed a mental disorder diagnostic interview and had blood specimens collected after a 12-h fast, as a part of the Third National Health and Nutrition Examination Survey, 1988–1994. The serum concentrations of total cholesterol, high-density lipoprotein cholesterol (HDL-C), and low-density lipoprotein cholesterol (LDL-C) were dichotomized according to the recommended levels of the National Cholesterol Education Program. A polytomous logistic regression was employed to control for covariates.

Results: Independent of socio-demographic variables, health risks and nutrition status, and a history of medical and psychiatric illness (including depression), a significant association between low HDL-C (≤ 40 mg/dl) and increased prevalence of suicide attempts was observed in women (OR = 2.93, 95% CI = 1.07–8.00). No significant evidence was found to support an association between cholesterol and suicide ideation in women. Serum cholesterol was unrelated with either suicide ideation or attempts in men.

Limitation: The inherent limitation of cross-sectional design prevented the authors from investigating causality.

* Corresponding author. 4770 Buford Hwy, Mailstop K24, Atlanta GA 30341, United States. Tel.: +1 770 488 5433; fax: +1 770 488 6500.
E-mail address: bvv2@cdc.gov (J. Zhang).

Conclusions: Low HDL-C is significantly associated with suicide attempts in women. Further studies are necessary to explore the clinical application of serum cholesterol as an indicator for suicide attempts among high risk population.

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1. Introduction

Due to its potential importance, the relation between suicide and serum cholesterol has been the subject of much debate since the publication of several reports (Muldoon et al., 1990; Jacobs et al., 1992) in the early 1990s suggesting the possible relevance of serum cholesterol to suicides. Increased incidence or prevalence of completed and attempted suicides among people with low serum cholesterol was observed from cross-sectional (Ozer et al., 2004; Repo-Tiihonen et al., 2002; Tripodanakis et al., 2002; Atmaca et al., 2003), retrospective case-control (Atmaca et al., 2002a,b, 2003; Garland et al., 2000; Kim et al., 2002; Kim and Myint, 2004; Lee and Kim, 2003; Lindberg et al., 1992; Vevera et al., 2003), cohort studies (Partonen et al., 1999; Zureik et al., 1996; Neaton et al., 1992; Lindberg et al., 1992; Ellison and Morrison, 2001) as well as a genetic study (Lalovic et al., 2004). However, other studies were not able to detect the association (Tanskanen et al., 2000a,b; Knox et al., 1996; Deisenhammer et al., 2004). The inconsistent findings may be related to study designs, in that most of the previous studies used convenient samples drawn from psychiatric patients, among which serum samples were generally collected on admission or within 48 h following admission. Measurement on admission might confound the results, as psychotropic medications given to psychiatric patients, such as selective serotonin uptake inhibitors, medications taken in the suicide attempts or the medical treatment itself, might affect cholesterol profiles. The risks of suicide behaviors are drawn from multiple domains and serum cholesterol levels are sensitive to age, gender, nutritional status, as well as many factors still unknown. The relatively small sample sizes precluded previous studies from controlling for covariates comprehensively. These limitations may jeopardize the validity of the studies, as well as the generalizability to the broader population. To address these limitations, we analyzed the

data from a national survey of the general population with major confounding factors controlled for. The aim of the current study is to test the hypothesis that serum cholesterol was associated with suicide ideation and suicide attempts among relatively healthy young adults from a community survey.

2. Material and methods

2.1. Study population

The Third National Health and Nutrition Examination Survey (NHANES III) was a cross-sectional survey of the US non-institutionalized civilian population conducted from 1988 to 1994. Detailed descriptions of the survey have been published elsewhere (National Center for Health Statistics, 1996). A total of 7968 adults aged 17–39 years participated in the survey, and 3559 were randomly assigned to a morning physical examination group and had a 12-h fast before blood was collected. Two participants were excluded due to missing information on mental health: 134 participants identifying themselves as American Indians, Asians or Pacific Islanders were also excluded due to relative small sample size. Additional 186 participants were excluded because the data for serum total cholesterol (TC) was not available. The data of the remaining 3237 participants were used for the current study.

2.2. Variable definitions and measurements

2.2.1. Suicide ideation and attempts

As a part of the Diagnostic Interview Schedule, participants were asked several questions specifically related to suicide, including “Have you ever felt so low that you thought of committing suicide (suicide ideation)?” and “Have you ever attempted suicide (suicide attempt)?” The time frame for these questions was lifetime. We generated a new variable from these

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