

ELSEVIER
WebShop Elsevier's Language Editing service
 Make sure your manuscript is written in perfect English before submission [Learn more ▶](#)

DRUG AND ALCOHOL Dependence

RSS Feeds [Mobile](#)
 Login | Register | Subscribe

[Articles & Issues](#) [Collections](#) [For Authors](#) [Journal Info](#) [Subscribe](#) [CPDD](#) [More Periodicals](#)

All Content [Advanced Search](#)

[< Previous Article](#)

[Articles in Press](#)

[Next Article >](#)

Article in Press

Access this article on
[ScienceDirect](#)

Cannabis smoking and serum C-reactive protein: A quantile regressions approach based on NHANES 2005–2010

[Omayma Alshaarawy](#), [James C. Anthony](#)

Department of Epidemiology and Biostatistics, Michigan State University, East Lansing, MI 48823, United States

Received: September 25, 2014; Received in revised form: November 13, 2014; Accepted: November 19, 2014; Published Online: November 28, 2014

DOI: <http://dx.doi.org/10.1016/j.drugalcdep.2014.11.017>

Publication stage: In Press Corrected Proof

[Article Info](#)

Article Tools

[PDF \(520 kB\)](#)

[Download Images \(.ppt\)](#)

[About Images & Usage](#)

[Email Article](#)

[Add to My Reading List](#)

[Export Citation](#)

[Create Citation Alert](#)

[Cited by in Scopus \(0\)](#)

[Abstract](#) [Full Text](#) [Images](#) [References](#) [Supplemental Materials](#)

Highlights

- We present estimates on cannabis smoking-attributable immunomodulation as manifest in serum CRP levels.
- Evidence suggesting cannabis-antiinflammatory effects emerges at CRP levels below the median.
- Stratification by BMI disclosed no appreciable variation of the cannabis–CRP relationship.

Abstract

Background

Pre-clinical studies link cannabinoid-1 receptor activation to inflammation and atherosclerotic effects; anti-inflammation and immunosuppression seem to be mediated by cannabinoid-2 receptor activation. In this epidemiological study, we aim to present estimates on suspected cannabis-attributable immunomodulation as manifest in serum C-reactive protein (CRP) levels as non-specific inflammatory markers with interpretable clinical values. With strength of data from recent large nationally representative community sample surveys, the research approach illustrates value of a quantile regressions approach in lieu of the commonly used but relatively arbitrary cutpoints for CRP values.

Methods

The study population encompasses 20–59 year old participants from the National Health and Nutrition Examination Surveys, 2005–2010 ($n = 1115$ recently active cannabis smokers and 8041 non-smokers, identified via confidential Audio Computer Assisted Self-Interviews). Age, sex, race, education, income–poverty ratio, alcohol consumption, and tobacco smoking also were measured, together with body mass index (BMI), which actually might be on a mediational path. Quantile regressions, with bootstrapping for variance estimation, made it possible to hold these covariates constant while estimating cannabis-CRP associations.

Results

Evidence suggesting possible cannabis-attributable immunomodulation emerges at CRP levels below the median ($p < 0.05$). Whereas BMI might help explain a cannabis link with serum CRP, but BMI-stratified analyses disclosed no

appreciable variation of the cannabis–CRP relationship across BMI subgroups.

Conclusions

Extending pre-clinical research on cannabis-attributable immunomodulation, this study's CRP evidence points toward possible anti-inflammatory effects of cannabis smoking. More definitive evidence can be derived by combining pre-clinical research, studies of patients, and epidemiological research approaches.

Abbreviations:

[NHANES](#) (National Health and Nutrition Examination Surveys), [CRP](#) (C-reactive protein), [BMI](#) (body mass index)

Keywords:

[NHANES](#), [CRP](#), [Cannabis smoking](#), [Inflammation](#), [Immunomodulation](#)

To access this article, please choose from the options below

Log In

Email/Username:

Password:

Remember me

[Forgot password?](#)

Register

[Create a new account](#)

Purchase access to this article

You must be logged in to purchase this article.

Claim Access

If you are a current subscriber with Society Membership or an Account Number, [claim your access now](#).

Subscribe to this title

[Purchase a subscription](#) to gain access to this and all other articles in this journal.

Institutional Access

[Visit ScienceDirect](#) to see if you have access via your institution.

ADVERTISEMENT

NEW ONLINE
OPEN ACCESS
JOURNAL

Internet
Interventions



The application
of information
technology in
mental and
behavioural
health



SUBMIT YOUR
PAPER HERE

© 2014 Elsevier Ireland Ltd. Published by Elsevier Inc. All rights reserved.

[< Previous Article](#)

Articles in Press

[Next Article >](#)

Copyright © 2014 Elsevier Inc. All rights reserved. | [Privacy Policy](#) | [Terms & Conditions](#) | [About Us](#) | [Help & Contact](#)
The content on this site is intended for health professionals.

Advertisements on this site do not constitute a guarantee or endorsement by the journal, Association, or publisher of the quality or value of such product or of the claims made for it by its manufacturer.