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Alcohol brief intervention in primary care: Blood pressure outcomes in hypertensive patients☆,☆☆

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ABSTRACT

Background: In clinical trials alcohol brief intervention (BI) in adult primary care has been efficacious in reducing alcohol consumption, but we know little about its impact on health outcomes. Hypertension is a prevalent and costly chronic condition in the U.S. and worldwide, and alcohol use is a modifiable hypertension risk factor.
Objective: To evaluate the effect of receiving BI for unhealthy drinking on blood pressure (BP) control among adult hypertensive patients by analyzing secondary data from a clustered, randomized controlled trial on alcohol screening, brief intervention and referral to treatment (SBIRT) implementation by primary care physicians (PCP intervention arm) and non-physician providers and medical assistants (NPP&MA intervention arm) in a large, integrated health care delivery system.
Design: Observational, prospective cohort study.
Subjects: 3811 adult hypertensive primary care patients screening positive for past-year heavy drinking at baseline, of which 1422 (37%) had an electronic health record BP measure at baseline and 18-month follow-up.
Main outcome measures: Change in BP and controlled BP (systolic/diastolic BP <140/90 mm Hg).
Results: Overall no significant associations were found between alcohol BI and BP change at 18-month follow-up when analyzing the combined sample of subjects in both intervention arms. However, moderation analyses found that receiving BI for positive past-year unhealthy drinking was positively associated with better BP control at 18 months in the PCP intervention arm, and for those with lower heavy drinking frequency and poor BP control at the index screening.
Conclusions: Our findings suggest that hypertensive patients may benefit from receiving physician brief intervention for unhealthy alcohol use in primary care. Findings also highlight potential population-level benefits of alcohol BI if widely applied, suggesting a need for the development of innovative strategies to facilitate SBIRT delivery in primary care settings.

1. Introduction

Alcohol brief intervention (BI) in adult primary care has been found efficacious in clinical trials in reducing alcohol consumption, especially among non-dependent, at-risk drinkers (Ballesteros, Duffy, Querejeta, Arino, & Gonzalez-Pinto, 2004; Jonas et al., 2012; E. F. Kaner et al., 2007; Whitlock et al., 2004). However, implementation of alcohol BI in routine adult primary care remains a challenge. Further, evidence from clinical trials of the efficacy of BI has not been well translated into real-world settings. While a recent review of systematic reviews and meta-analyses (Faries, Leon, Haro, & Obenchain, 2010) supports the effectiveness of BI at reducing alcohol related problems across a wide range of patients in primary care, findings from limited evaluations of implementation studies in adult primary care found no significant effects of BI on drinking outcomes (Hilbink, Voerman, van Beurden, Penninx, & Laurant, 2012; E. Kaner et al., 2013; Williams et al., 2014).

The literature is even more limited on the impact of alcohol BI on health outcomes. The high burden of unhealthy drinking and alcohol use disorders among adult primary care patients with chronic conditions is well recognized, especially among those with hypertension, diabetes and depression (Babor et al., 2012; Boschloo et al., 2012; Cook & Cherpitel, 2012; Engler, Ramsey, & Smith, 2013; Klatsky, 2004; Mertens, Weisner, Ray, Fireman, & Walsh, 2005; Timko, Kong, Vittorio, &

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Cucciare, 2016). Hypertension is an important condition to assess, as it affects about one-third of the U.S. adult population (Lewington et al., 2002; Shaw, Handler, Wall, & Kanter, 2014), and when uncontrolled contributes significantly to morbidity and mortality (Egan, Zhao, & Axon, 2010; Vasan et al., 2001). Excessive alcohol consumption is associated with adverse blood pressure (BP) changes (Klatsky, 2004; Miller, Anton, Egan, Basile, & Nguyen, 2005) and noncompliance with antihypertensive treatment (Bryson et al., 2008; Cook & Cherpitel, 2012). Thus, BI to reduce risky drinking would seem to offer promise for improving health outcomes such as hypertension. A recent review (Timko et al., 2016) concluded that findings from the few studies that have been conducted suggest positive effects of alcohol BI on BP outcomes among hypertensive patients. However, out of the six studies on alcohol BI among patients with hypertension, only three examined BP outcomes, and two of these had very small sample sizes. Expanding the scientific knowledge base on the relationship between alcohol BI and health outcomes for primary care patients with chronic conditions is a critical gap.

This observational, prospective cohort study aims to evaluate the effect of BI for unhealthy drinking on BP control among adult hypertensive patients through secondary analysis of data from a clustered, randomized controlled implementation trial comparing alcohol screening, brief intervention or referral to treatment (SBIRT) delivered by physicians versus non-physician providers versus usual care (Mertens et al., 2015). We examine the effect of BI on BP and BP control, taking into consideration initial BP control status and drinking level. The original trial found significant differences in SBIRT implementation outcomes across delivery models, with screening rates highest if performed by medical assistants, but BI or referral rates among patients screening positive highest if delivered by primary care physicians. Informed by these findings and the literature, we hypothesize that the association between receiving BI and BP will be moderated by study intervention arm, baseline unhealthy drinking level and baseline BP status.

2. Methods

2.1. Settings and sample

The Alcohol Drinking as a Vital Sign (ADVISe) trial evaluated alcohol SBIRT implementation in a large, integrated health care delivery system by randomizing 54 adult primary care clinics to three intervention arms: 1) PCP intervention arm, with SBIRT delivered by primary care physicians, 2) NPP&MA intervention arm, in which medical assistants (MAs) screened and non-physician providers (NPPs) such as clinical health educators, behavioral medicine specialists or registered nurses delivered brief intervention and referral to treatment, and 3) usual care as Control arm. In both intervention arms, providers were trained to deliver the same intervention, drawn from the NIAAA Guide (National Institute on Alcohol Abuse and Alcoholism, 2005). Patients who screened positive on the unhealthy drinking questions would receive brief intervention consisting of providers stating their concern and advising them to cut back to low risk limits or abstain, as outlined in the NIAAA Guide (National Institute on Alcohol Abuse and Alcoholism, 2005). Providers were trained in brief motivational intervention, and to: 1) incorporate salient medical conditions if possible, 2) ask patients how ready they were to make the recommended changes, and 3) assist in goal-setting to reduce or quit drinking if the patient was willing. Patients were also given the NIAAA publication "Tips for Cutting Down on Drinking" (National Institute on Alcohol Abuse and Alcoholism, 2007).

In the first year of the study, 639,613 unique patients had visits across all study sites. The trial found low screening and intervention rates in the Control arm (Mertens et al., 2015). Thus, we include only patients in the two intervention arms in this study (218,667 in PCP intervention arm; 223,147 in NPP&MA intervention arm). Among them, 176,273 (39.9%) were screened with the evidence-based NIH screener asking the number of times they exceeded the CDC/NIH daily drinking limits in the past year (no >4 drinks for men; no >3 for women and seniors) (National Institute on Alcohol Abuse and Alcoholism, 2005; Smith, Schmidt, Allensworth-Davies, & Saitz, 2009). Of those screened, 18,689 (10.6%) reported at least one day drinking above daily limits; among them 1878 (10%) received BI per the electronic health record (EHR). See Mertens et al. for details of the methods (Mertens et al., 2015).

For this current study, the analytical sample consisted of those in the ADVISe year 1 cohort who: (1) were in the PCP or NPP&MA intervention arm, (2) exceeded CDC/NIH daily drinking limits in the past year (National Institute on Alcohol Abuse and Alcoholism, 2005; P. C. Smith et al., 2009) and (3) had a hypertension diagnosis in the year prior to the index screening ($N = 3811$). Of these, 1422 (37.3%) had an EHR recorded BP measure at both index screening and 18-month follow-up (allowing a 90-day window from 45 days prior to 45 days after the exact follow-up date).

2.2. Measures

The outcome measures were change in BP, and "controlled BP" (systolic/diastolic BP <140/90 mm Hg), at 18-month follow-up per EHR records. For multiple EHR measures, the first was used.

The predictor of interest was receipt of BI for unhealthy drinking, measured as having a visit in which a brief intervention was recorded at, or within 45 days of, the positive screening visit. We allowed a 45-day window because providers were trained to schedule a follow-up visit for the BI within 6 weeks if unable to complete during the screening visit. We examined the EHR tool (containing fields for providers to record brief interventions) and also the diagnostic "V-code" for "Counseling, Alcohol Prevention" as indication of brief intervention or referral (as per the training).

We examined three potential moderators: (1) intervention arm (PCP or NPP&MA intervention arms), (2) baseline unhealthy drinking days (<8 or 8+ days in past year) and (3) baseline BP control status (controlled or uncontrolled, defined based on whether systolic/diastolic BP <140/90 mm Hg). Baseline unhealthy drinking days were dichotomized as <8 or 8+ days in past year, because prior research found that a threshold of 8 times or more predicted dependence risk and has been used to distinguish severity in studies of brief interventions (Saitz, Cheng, Allensworth-Davies, Winter, & Smith, 2014).

Patient demographic (age, gender, race/ethnicity) and clinical characteristics (medical and psychiatric comorbidities) were extracted from the EHR. We also identified presence of a psychiatric diagnosis (i.e., psychoses, neurotic, personality and other psychiatric disorders) and presence of a chronic disease diagnosis (i.e., Arthritis, Chronic Pain, Diabetes Mellitus, Asthma, Ischemic Heart Disease, Congestive Heart Failure, Stroke/Cerebrovascular Accident, Epilepsy, Parkinson's Disease, End-Stage Renal Disease, HIV, Osteoporosis, Chronic Obstructive Pulmonary Disease) in the year prior to each patient's index screening using data extracted from the EHR. The demographic and clinical variables were used for assessing differences between those with and without documented BIs, and for generating the proper inverse probability weights to account for the potential selection and attrition biases (see Statistical analysis below).

2.3. Statistical analysis

We compared differences in patient characteristics at index screening, and BP at index screening and 18-month follow-up, between those with and without documented BIs by conducting *t*-tests for continuous variables and chi-square tests for categorical variables. We next fit general linear and logistic regression models to examine associations between documented BI and change in BP and controlled BP at 18 months, respectively, and addressed issues of potential treatment selection bias and attrition bias with inverse probability weighting (IPW)