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Psychiatry Research

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

Reducing smoking reduces suicidality among individuals with psychosis: Complementary outcomes from a Healthy Lifestyles intervention study



Anoop Sankaranarayanan^{a,b,*}, Vanessa Clark^b, Amanda Baker^b, Kerrin Palazzi^c, Terry J. Lewin^{a,b,d}, Robyn Richmond^e, Frances J. Kay-Lambkin^{d,f}, Sacha Filia^{g,h}, David Castle^{i,j,k}, Jill M. Williams^l

^a Hunter New England Mental Health Service, Australia

^b School of Medicine and Public Health, University of Newcastle, Callaghan, NSW, Australia

^c Public Health Program, Hunter Medical Research Institute (HMRI), Newcastle, NSW, Australia

^d Centre for Translational Neuroscience and Mental Health, University of Newcastle, Australia

^e School of Public Health and Community Medicine, University of New South Wales, Sydney, Australia

^f NHMRC Centre for Research Excellence in Mental Health and Substance Use, National Drug and Alcohol Research Centre, University of New South Wales, Australia

^g Monash Alfred Psychiatry Research Centre, Central Clinical School, Monash University, Victoria, Australia

^h Alfred Hospital, 55 Commercial Road, Prahran, Melbourne, Victoria, Australia

ⁱ St. Vincent's Hospital, PO Box 2900, Fitzroy, Victoria, Australia

^j The University of Melbourne, Parkville, Melbourne, Victoria, Australia

^k Faculty of Health Sciences, Australian Catholic University, 1100 Nudgee Road, Banyo, Queensland, Australia

^l Division of Addiction Psychiatry, Rutgers-Robert Wood Johnson Medical School, New Brunswick, NJ, USA

ARTICLE INFO

Article history:

Received 31 December 2015

Received in revised form

2 June 2016

Accepted 4 July 2016

Available online 8 July 2016

Keywords:

Suicide
Suicidality
Suicide risk
Smoking
Schizophrenia
Psychosis

ABSTRACT

This study sought to explore the impact of smoking reduction on suicidality (suicide ideation and behaviour) among people with a psychotic disorder ($n=235$) who participated in a randomized trial of a healthy lifestyle intervention trial. Suicidality, measured by item –4 of the Brief Psychiatric Rating Scale (BPRS) was the main variable of interest. Measures were collected by research assistants blind to treatment allocation at baseline, at 15 weeks (mid-intervention) and 12 months after baseline. Mediation analysis, adjusted for confounders, was used to determine the relationship between smoking reduction and suicidality and to explore whether this was mediated through depression. At 12 months, smoking reduction was found to be significantly associated with suicidality change; an association was also seen between smoking reduction and depression and suicidality. After adjusting for depression, the association between smoking reduction and suicidality was attenuated but remained statistically significant; the proportion of the total effect that was mediated through depression was 30%. There was no significant association between suicidality and treatment group (vs. controls) over time. Our study suggests that smoking interventions may have benefits over and above those for improved physical health, by reducing suicidal ideation in people with psychosis.

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1. Introduction

People living with a severe mental illness (SMI) are at increased risk for substance misuse and suicidal behaviours, the risk being particularly high in those with schizophrenia and major

depression (Cooper et al., 2012; Ostacher et al., 2006; Wilhelm et al., 2003). For example, Hartz et al. (2014) compared substance use in a multi-ethnic cohort of patients with SMI to that of population based controls and found that individuals with psychotic disorders were more likely to smoke (Odds Ratio, OR 4.6; 95% CI, 4.3–4.9), use alcohol (OR 4.0; 95% CI 3/6–4.4), cannabis (OR 3.5; 95% CI 3.2–3.7) and recreational drugs (OR 4.6; 95% CI 4.3–5.0). High rates of substance use were also described among participants of the Australian Survey of High Impact Psychoses (SHIP) study. Also, more than half the sample had a diagnosis of alcohol abuse/dependence and cannabis abuse/dependence and nearly

* Corresponding author at: School of Medicine and Public Health, University of Newcastle, Callaghan, NSW, Australia.

E-mail address: anoopshank2000@gmail.com (A. Sankaranarayanan).

¹ Present Address: Psychiatrist, Community Health Centre, 65 Brunswick Street, Frederickton, NB E3B 1G5.

one-third had evidence of other illicit drug abuse or dependence (Moore et al., 2012). Earlier research promoted the “self-medication hypothesis” to explain the high rates of smoking seen in people with schizophrenia (Lohr and Flynn, 1992; Kumari and Postma, 2005). However, this is not straightforward. For example, while some researchers argue that smoking is associated with lower incidence of negative symptoms (Smith et al., 2002; Zhang et al., 2012), a recent meta-analysis suggests that daily tobacco use is associated with greater risk of psychosis (Gurillo et al., 2015).

Historically, it has generally been accepted that between 20% and 40% of patients with schizophrenia attempt suicide (Roy, 1986) and 10–15% die by suicide (Drake et al., 1985). More recent work suggests an estimated lifetime suicide prevalence of 4.9% (Palmer et al., 2005) in people with schizophrenia, with suicide deaths usually occurring soon after illness onset. Identified risk factors for suicide and deliberate self-harm (DSH, including suicide attempt) in schizophrenia, include previous depressive disorders, previous suicide attempts, drug misuse, poor adherence to treatment, recent life events (Haw and Hawton, 2005; Hawton et al., 2005; Hor and Taylor, 2010), early life adversities, pain syndromes (Fuller-Thomson and Hollister, 2016) and smoking (Sankaranarayanan et al., 2015).

There is evidence to suggest that smoking cessation reduces suicidal risk; for example, the association between smoking and suicidal behaviours has been shown to be higher among current and ex-smokers compared to never smokers (Li et al., 2012). A recent data-linkage analysis indicates that tight legislation and policies to restrict smoking are associated with a reduction in suicidality in the general population (Grucza et al., 2014). Such studies cannot, however, control for potential confounders that might also influence smoking over an extended time period. Thus, it is conceivable that interventions to address smoking could potentially also serve to reduce suicidality. Capron et al. (2014) investigated the effects of successful and unsuccessful smoking interventions on psychopathology scores (measures of depression and anxiety) in non-psychotic individuals. They found no worsening in psychopathology in those who quit smoking. We are not aware of any previous studies that have specifically studied the impact of smoking cessation on suicidality scores among smokers with SMI. The sub-study reported here aimed to address this gap, by determining the impact of a smoking cessation intervention on suicidality scores among people with a SMI. We hypothesised *a priori* that reduced smoking would be associated with lower suicidality.

2. Methods

The current project is a sub-study of a Healthy Lifestyles intervention trial for smokers with SMI, which has been reported in detail elsewhere (Baker et al., 2011, 2015).

While the current analyses and findings complement those of the main study, they have a different purpose. The specific objectives of this sub-study were to:

1. Measure change in suicidality between baseline and 12 months;
2. Examine the association between suicidality and treatment group over time; and
3. Examine the effect reduced smoking had on suicidality, including the potential mediating pathway through depression.

2.1. Participants and procedure

Smokers with a psychotic disorder (N=235) were recruited across three sites (in Newcastle, Sydney and Melbourne, Australia). Ethics approval was obtained from Hunter New England Human

Ethics Committee (for the lead site) and from each of the other site's university and hospital ethics committees. Participants were included if they were: aged at least 18 years; smoking at least 15 cigarettes per day; diagnosed with a schizophrenia spectrum or bipolar disorder, as confirmed by the Mini International Neuropsychiatric Interview (MINI) (Sheehan et al., 1998); and taking antipsychotic medication as prescribed for a period of at least two months, with intention to continue for the duration of the study. Exclusion criteria were: not fluent in English; had an organic brain disease, or any medical conditions that would preclude nicotine replacement therapy (NRT). Following a baseline assessment, participants completed a standardised 90-min face-to-face intervention session, at the conclusion of which they were randomised to a face-to-face intervention addressing smoking, diet and exercise or to a less intensive predominantly telephone-based intervention (comparison condition); both groups were offered NRT (see Baker et al. (2011, 2015) for full study details). All study measures were undertaken by research assistants blinded to treatment allocation at baseline, 15 weeks (mid-intervention) and 12 months after baseline.

2.2. Measures

Smoking (cigarettes/day), depression and suicidality were measured at three time points (baseline, 15 weeks and 12 months post baseline). For the current analyses, these time points were expressed as months (0, 3.5 and 12) and used as a continuous time measure.

2.2.1. Suicidality

We defined suicidality as any active suicidal thoughts or plans or intent or attempt. Suicidality was measured at baseline and follow-up using clinician-rated item 4 of the Brief Psychiatric Rating Scale (BPRS) (Ventura et al., 1993). The BPRS item 4 requires participants to report suicidal thoughts over the previous two week period.

2.2.2. Psychiatric symptomatology and quality of life

Diagnoses were determined using the Mini-International Neuropsychiatric Interview (MINI) (Sheehan et al., 1998). General functioning was measured using the Global Assessment of Functioning Scale (GAF) (APA, 1994) and 12-item Short Form survey (SF-12) (Ware et al., 1996), which produces Mental Component Scores (MCS) and Physical Health Component Scores (PCS), with lower scores indicating greater disability. The total score for the Beck Depression Inventory (BDI-II) was used to measure current depressive symptoms; the higher the scores, the more severe the depression.

2.2.3. Medication use

Medication use was self-reported and recorded as psychotropic or general medication.

2.2.4. Substance use

Tobacco, alcohol and cannabis usage was measured using the Drug Use Scale of the Opiate Treatment Index (OTI) (Darke et al., 1991). The OTI (tobacco; cannabis; alcohol items) provides a measure of average use occasions per day in the month preceding assessment: for example, cigarettes per day (CPD). Smoking reduction percentage was measured by dividing OTI cigarettes/day at the particular time point (e.g., 15 weeks or 12 months) by OTI cigarettes/day at baseline, multiplied by 100; with complete smoking cessation classified as 100% smoking reduction. Likewise, if the number of cigarettes smoked stayed the same or increased from baseline then the individual was classified as zero percent reduction.

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