



Tobacco, alcohol and cannabis use during pregnancy: Clustering of risks[☆]



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ABSTRACT

Background: Antenatal substance use poses significant risks to the unborn child. We examined use of tobacco, alcohol and cannabis among pregnant Aboriginal and Torres Strait Islander women; and compared characteristics of women by the number of substances reported.

Methods: A cross-sectional survey with 257 pregnant Indigenous women attending antenatal services in two states of Australia. Women self-reported tobacco, alcohol and cannabis use (current use, ever use, changes during pregnancy); age of initiation of each substance; demographic and obstetric characteristics. **Results:** Nearly half the women (120; 47% (95%CI:40%, 53%)) reported no current substance use; 119 reported current tobacco (46%; 95%CI:40%, 53%), 53 (21%; 95%CI:16%, 26%) current alcohol and 38 (15%; 95%CI:11%, 20%) current cannabis use. Among 148 women smoking tobacco at the beginning of pregnancy, 29 (20%; 95%CI:14%, 27%) reported quitting; with 80 of 133 (60%; 95%CI:51%, 69%) women quitting alcohol and 25 of 63 (40%; 95%CI:28%, 53%) women quitting cannabis. Among 137 women reporting current substance use, 77 (56%; 95%CI:47%, 65%) reported one and 60 (44%; 95%CI:35%, 53%) reported two or three. Women using any one substance were significantly more likely to also use others. Factors independently associated with current use of multiple substances were years of schooling and age of initiating tobacco. **Conclusions:** While many women discontinue substance use when becoming pregnant, there is clustering of risk among a small group of disadvantaged women. Programmes should address risks holistically within the social realities of women's lives rather than focusing on individual tobacco smoking. Preventing uptake of substance use is critical.

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1. Introduction

Antenatal substance use is associated with significant risks to the unborn child. Smoking tobacco increases the risk of low birth weight (LBW), pre-term birth, intra-uterine growth retardation (IUGR) and perinatal death (British Medical Association, 2004). Alcohol is teratogenic and use during pregnancy may result in foetal alcohol syndrome as well as LBW, preterm birth and perinatal death (NHMRC, 2009). While less well established, smoking cannabis is associated with adverse outcomes including LBW, preterm birth, IUGR and admission to the neonatal intensive care unit (Hayatbakhsh et al., 2012). Antenatal exposure to any of these

substances is also related to adverse child behavioural and cognitive outcomes including Attention Deficit Hyperactivity Disorder, increased externalising behaviour and decreased cognitive function (Huizink and Mulder, 2006).

In Australia, pregnant Aboriginal and Torres Strait Islander (hereafter referred to as Indigenous) women are more likely to smoke tobacco than non-Indigenous pregnant women, with 50% of Indigenous women reporting smoking antenatally (Li et al., 2011). Smoking rates are also elevated among pregnant Indigenous women in Canada, New Zealand and the United States (Dixon et al., 2009; National Center for Health Statistics, 2012; The First Nations Information Governance Centre and First Nations Regional Health Survey (RHS), 2012). National data on antenatal alcohol and cannabis use is not available, however nearly one third of Indigenous Australian women aged 15–45 years report alcohol consumption at risky levels, and one in ten used cannabis in the last 12 months (Australian Institute of Health and Welfare, 2011a). Studies among pregnant Indigenous Australian women have identified rates of alcohol consumption between nine and 38% (Panaretto et al., 2005; Rumbold et al., 2011; Stewart and Li, 2005; Zubrick et al., 2004) and cannabis use between nine and 12% (Panaretto

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et al., 2005; Zubrick et al., 2004). High rates of substance use among Indigenous peoples have been attributed to social and historical factors including socio-economic disadvantage, marginalisation, impacts of colonisation and grief and loss (Gray et al., 2004; Siggers and Gray, 1998; Thomas et al., 2008).

Associations between use of these substances are well recognised. Alcohol consumption is associated with higher rates of tobacco and cannabis smoking and lower rates of smoking cessation (Australian Institute of Health and Welfare, 2011a; Hendricks et al., 2011). Similarly, the prevalence of tobacco smoking is higher among cannabis smokers, (Agrawal et al., 2012; Australian Institute of Health and Welfare, 2011a) including among Indigenous Australians (Clough, 2005).

Studies among pregnant women have examined relationships between use of tobacco and illicit drugs or alcohol, but few have specifically explored concurrent use of tobacco, alcohol and cannabis. Dutch women using cannabis in early pregnancy were more likely to use alcohol and tobacco during early pregnancy and continue to smoke tobacco (El Marroun et al., 2008). Among pregnant Danish women, alcohol intake was associated with tobacco smoking, but too few women used cannabis to allow statistical testing (Kesmodel et al., 2003). English and Spanish studies have also found associations between antenatal use of cannabis, alcohol and tobacco (Fergusson et al., 2002; Friguls et al., 2012).

We identified only two studies exploring concurrent use of alcohol, tobacco and cannabis among pregnant Indigenous women. The Western Australian Aboriginal Child Health Survey interviewed mothers of children aged 0–17 years about substance use during their pregnancy, and reported high rates of use (tobacco 49%, alcohol 23% and cannabis 9%) with women using one substance also more likely to use others (Zubrick et al., 2004). A study among Canadian Inuit women reports high rates of use of each substance and strong associations between alcohol consumption and use of tobacco and cannabis (Muckle et al., 2011).

Given the significant harm associated with antenatal use of these substances and the high rates of use among non-pregnant Indigenous Australian women, better understanding of use during pregnancy is important in developing appropriate programmes to reduce the associated harms and improve birth outcomes.

This paper examines self-reported and concurrent use of tobacco, alcohol and cannabis among pregnant Indigenous women and compares characteristics of women by the number of current substances reported.

2. Methods

Cross-sectional surveys with pregnant Indigenous women were undertaken in the Northern Territory (NT) and New South Wales (NSW). The project was guided by a community reference group (CRG) of Aboriginal women and service providers from rural NSW to enhance cultural security.

2.1. Recruitment

2.1.1. Settings. 22 of 28 Aboriginal Maternal and Infant Health Strategy (AMIHS) teams, providing antenatal care in community settings agreed to participate. From July to December, 2009, eligible women receiving antenatal care at these sites were invited to participate by the midwife or Aboriginal Health Worker. Aboriginal Health Workers are health professionals who work in a range of roles within the health system to facilitate engagement between Indigenous Australians and the health system. Each site was asked to recruit five to 20 consecutive women, proportional to the number who received antenatal care in the previous year. A female Aboriginal research assistant recruited eligible women from the antenatal clinic of a major hospital from July to September 2010 and April to June 2011.

2.1.2. Client sample. Women were eligible if pregnant and if they or their partner were Indigenous. They were excluded if they were aged less than 16; being treated for mental illness; or unable to provide informed consent. The staff explained the study and provided eligible women with information sheets. Written consent was obtained. Recruitment staff offered assistance to complete the questionnaire if required. Staff completed a recruitment log to track participation rates but did not collect data on non-participants.

2.2. Questionnaire development and contents

Questionnaire development is described in detail elsewhere (Passey et al., 2012). In brief, it involved initial review of published literature on substance use during pregnancy and/or among Aboriginal peoples to develop the draft questionnaire. This was critically reviewed by the CRG and colleagues experienced in Aboriginal health research, tobacco control and questionnaire design, to assess face and content validity, reduce redundancy and refine the wording to ensure cultural appropriateness. Minor revisions included removal of some redundant questions and addition of others. The revised questionnaire was pilot-tested with 15 pregnant Aboriginal women in NSW and Western Australia. The CRG discussed feedback from these women, with further minor changes.

The final questionnaire had a grade 6 Flesch-Kincaid reading level and took 15–20 min to complete. The items relevant to this paper covered: (1) *Demographic and obstetric characteristics*: age, education, if the pregnancy was planned, gestation, parity, and number of antenatal visits; (2) *Tobacco smoking status and changes during pregnancy*: smoking status – current daily smoker, current occasional smoker, ex-smoker or never smoked. Current and ex-smokers were asked the age they started smoking, and changes to their smoking status since becoming pregnant; (3) *Cannabis smoking status and changes during pregnancy*: the same questions as for tobacco; (4) *Alcohol consumption and changes during pregnancy*: any alcohol in the previous month (never, only once, 2–4 times in the month, 2–3 times a week, or ≥ 4 times a week). Current and ex-drinkers were asked the age they started drinking and changes to drinking status in pregnancy.

2.3. Statistical analysis

Summary statistics of respondent characteristics were obtained. Age, years of school, parity and gestation were categorised, and the number and percentage in each category reported. The numbers of antenatal visits are presented as medians due to non-normal distributions.

For each substance (tobacco, alcohol, cannabis), women were classified as: current users; having quit during pregnancy; having quit prior to pregnancy; or never having used the substance, based on self-report. Women were also categorised as currently using zero, one, or two to three substances. Proportions in each category are presented with 95% confidence intervals. The age at which they reported initiating use of each substance was categorised into <15 years, ≥ 15 years or never.

Two-way tables were generated for each combination of substances. Odds ratios and exact 95% confidence intervals were generated to assess associations between use of one substance and use of each of the others, as well as between quitting one substance during pregnancy, and quitting each of the others.

Univariate associations of demographic and obstetric variables with number of substances currently used (0, 1, ≥ 2) were examined using Pearson's chi-square test for categorical explanatory variables and the non-parametric Kruskal–Wallis test for continuous variables. Multinomial logistic regression was used to determine associations between explanatory variables and the number of substances used, adjusting for clustering by site. Initially, all variables with a p -value < 0.25 in the univariate analyses were included in the model. Wald tests, adjusted for clustering of women within sites, were used to test the significance of each parameter estimate, with stepwise removal of variables with a p -value ≥ 0.1 . Jurisdiction (state/territory) was retained regardless of statistical significance as the differences in social context between jurisdictions were considered important.

We aimed to recruit 400 women but only recruited 264 within the study period. This sample allowed estimation of the prevalence of current substance use with 95% confidence intervals within $\pm 6\%$ of the point estimate. Assuming that approximately a third of women would be in each of the three substance use categories (0, 1, ≥ 2), and with a design effect of 1.2, the study would be able to detect differences between groups of slightly more than 20%.

2.4. Ethical approval

The study was approved by the Human Research Ethics Committees of the University of Newcastle; Hunter New England Health; the Aboriginal Health & Medical Research Council; NT Department of Human Services and Menzies School of Health Research.

3. Results

At the hospital, 137 women were invited and 107 (78%) consented. At community sites, 157 women consented. Of these, 128 were from the 15 sites which returned participation records documenting the number of women approached and consenting. These sites had invited 146 women, giving a response rate of 88%. The remaining seven sites returned 29 questionnaires but no participation records; thus the consent rate is unknown for these sites. Of the 264 questionnaires returned, 257 had data on current use of all three substances and are used in this analysis.

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