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ORIGINAL RESEARCH – QUANTITATIVE

Women's frequency of alcohol consumption prior to pregnancy and at their pregnancy-booking visit 2001–2006: A cohort study

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ABSTRACT

Background: With evidence of offspring harms and concern for younger women's drinking behaviours, this study uses a hospital cohort to trend the use and changes in women's reported alcohol consumption.
Aims: To examine (i) the trend of women's reported alcohol consumption over time, (ii) whether any increases in the frequency of alcohol consumption prior to a pregnancy are accompanied by increases in the frequency of alcohol consumption in pregnancy and (iii) the characteristics of women consuming alcohol at these times.
Methods: Midwives collected routine data on 19,699 women between 2001 and 2006. Data on women's alcohol use prior to pregnancy and at their pregnancy-booking visit were analysed using a non-parametric test for trend and with bivariate and multivariate tests adjusting for possible confounders.
Findings: The proportion of women reporting at-least weekly alcohol use prior to pregnancy was 25.4% and 5.9% at their pregnancy-booking visit. A significant linear increase over time ($p < 0.001$) was found in the rate of women aged 20 years and older reporting at-least weekly alcohol use prior to pregnancy. Tertiary-educated women were more likely to consume alcohol at-least weekly prior to pregnancy. Women aged less than 20 years were less likely to report at-least weekly alcohol use at both time points. Having more children and Asian ethnicity were associated with a lower risk of at-least weekly alcohol use at these times.
Conclusion: The majority of women reduce their alcohol consumption once they learn they are pregnant, with some evidence this trend may have increased in recent years.

1. Introduction

1.1. Scope of the problem

Normal embryo–foetal development can be disrupted by gestational alcohol consumption due to the teratogenic activity of alcohol.[1] The term Foetal Alcohol Spectrum Disorder (FASD)[2] denotes a wide range of conditions[3–5] arising from gestational alcohol exposure. Specifically, reported harms have included malformations,[6,7] stillbirth,[8,9] in-utero and childhood growth restrictions,[10] learning deficits[11] and behavioural,[12] social[13] and mental health problems.[14] Foetal Alcohol Syndrome (FAS),[15] the more extreme condition on this spectrum, comprises of pre and postnatal growth retardation, central nervous system dysfunction and craniofacial and other anomalies.[2] These harms are linked generally to high-level alcohol consumption[16–18] although some reports suggest harm may occur at lower levels.[19,20] Also, offspring harms may be compounded by other environmental and genetic factors.[21] In Australia the full extent of this problem is unknown as

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while the birth prevalence rate of FAS has been reported as between 0.01 and 0.68 per 1000 live births, the prevalence of FASD has not been estimated.[22]

Australian alcohol consumption patterns are changing with the numbers of daily drinkers declining, although young people are still more likely to be risky drinkers.[23] In particular, younger-aged women's risky alcohol drinking rates are comparable with those of their male counterparts.[24] These risk behaviours lead to concern that young women may be compromising their own well-being and risking early-pregnancy alcohol exposure.

Women's alcohol consumption is greatly influenced by their social factors. Accordingly, reports on the prevalence of women consuming alcohol in pregnancy vary between 5% and 81%.[25–33] Such variation may reflect the differing population groups being studied, differing measures of alcohol and the timing of these measures relative to pregnancy gestation. We do know that the proportion of Australian women drinking while pregnant has declined.[23,34]

Women's pre-conception alcohol drinking is linked to their pregnancy alcohol drinking levels,[35] particularly in unplanned pregnancies.[36,37] Reports suggest the proportion of women consuming alcohol prior to pregnancy recognition can be high[33,38] but it does decline greatly during pregnancy.[33,38–41] Reports on the characteristics of those women who continued to drink alcohol during pregnancy differ considerably. Women aged 35 years and older[28,42] or less than 25 years,[30,41] those with[43] or without a partner,[44,45] having higher education[28] and social class[35] or socioeconomic disadvantage[34,44,45] and being of the predominant[28,30] or minority ethnicity,[43,46,47] have been reported as being at risk of continuing to use alcohol in pregnancy.

1.2. Objectives

Are more women drinking alcohol particularly the younger women, and if so does this consumption continue into pregnancy? Using routinely collected data from midwives' interviews conducted at women's pregnancy booking visit, this study aims to examine (i) trends in pregnant women's alcohol drinking over 6 years, (ii) changes in women's alcohol drinking levels from prior pregnancy to pregnancy booking visit and (iii) characteristics (as possible confounders) of women consuming alcohol at these times.

2. Methods

2.1. Participants and setting

The participants of this cohort study comprised of women who were interviewed for their pregnancy-booking visit at a Queensland maternity hospital between 2001 and 2006. Women were generally between 12 and 16 weeks of pregnancy (gestation was determined by women's self-report of their last menstrual period and/or confirmed by ultrasound examination). In total 21,972 public births from 21,393 pregnancies occurred at the hospital during this period. Records containing data on women's use of alcohol were included in the study sample. (The majority of cases with missing alcohol data and which were excluded from the study were found to represent women who had no prior booking before presenting to birth at this hospital.) There were few other instances of records with missing data of the variables used in the analyses and these records were included in the analysis.

2.2. Outcome measures

The outcome measures of this study comprise at-least weekly alcohol drinking prior to pregnancy and at pregnancy booking visit. In 1999, this hospital introduced an alcohol and drug-use assessment tool and administered by midwife-interviewers as part of the broader pregnancy-booking interview. These interviews were conducted face to face or by telephone. Responses were entered into the hospital's Obstetric Clinical Reporting System database (Clinical Reporting Systems Pty Ltd., Castle Hill, New South Wales, Australia). The same alcohol questionnaire was used over the entire study period. This assessment tool was developed with assistance from midwives and adapted from comprehensive alcohol and drug-use assessment tools used in local alcohol and drug services at that time. The tool comprised both menu responses and text boxes to enable midwives to adequately describe a woman's patterns of alcohol use and thus determine the level of risk. Validated alcohol screening tools measuring risky or dependent use were overlooked as midwives sought to identify women with *any* amount of alcohol use in early pregnancy.

Women who consumed alcohol prior to their pregnancy and current in pregnancy, reported the average number of days each week on which they consumed alcohol and the average number of standard drinks consumed on those days. Midwives used the recommended Australian standard drink measure of 10 grams of alcohol (equivalent to 12.5 ml of pure alcohol)[48] to estimate a level of use. When women's reported alcohol use was less than weekly, a description of their use was entered into text boxes. Responses varied and included describing drinking events, for example "Drank at New Year" and total amounts consumed, for example "3 wines since falling pregnant". These responses were unable to be coded but were determined to represent alcohol-drinking levels of less than weekly use.

2.3. Independent measures

Independent variables included, marital status and categorised as married/partnered (reference category), single, and widowed/separated/divorced. Maternal age was categorised as less than 20 years (reference category), 20–24 years, 25–29 years, 30–34 years, and 35 years or older. Education level included tertiary (reference category), Grade 12 (i.e. completed high school), Grade 10 or less (i.e. did not complete high school) and Unknown. Ethnicity/race was categorised as Caucasian (reference category), Aboriginal and Torres Strait Islander, Asian and Other ethnicity/race and parity was categorised as having no children (reference category), one child, two children, three children and four or more children.

2.4. Statistical analysis

Descriptive analysis was conducted to report on proportions and ratios of alcohol consumption in this sample. A Cuzick's non-parametric test for trend was conducted to determine if there were changes over time in the proportion of women aged less than 20 years and 20 years and older who consumed alcohol prior to pregnancy and at booking visit. The ratio between prior to pregnancy alcohol use, to use at pregnancy booking visit was also estimated. Bivariate logistic regression was used to describe the association between at-least weekly alcohol use measures (prior to pregnancy and at booking visit) and women's marital status, age, education, ethnicity/race and parity. Odds ratios (OR) and 95% Confidence Interval (CI) are reported. Subsequent to the bivariate analysis, multivariate logistic regression analysis was undertaken to determine independent associations between statistically significant maternal characteristics and alcohol use. Adjusted odds ratios (AOR) and 95% CI are reported. In addition statistical difference are reported at <0.05, <0.01 and <0.001. Analyses were carried out using Stata/SE version 11.2 (StataCorp, College Station, TX, United States of America).