Peri-conceptual and mid-pregnancy drinking:

A cross-sectional assessment in two Scottish health board areas using a 7-day Retrospective Diary

Retrospective Diary assessment of peri-conceptual and mid-pregnancy drinking

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Acknowledgements

We thank all the pregnant women who agreed to discuss their personal drinking habits with us, and the clinic staff who helped firstly to identify potential participants, and then to facilitate suitable accommodation for the interviews.

We would like to thank Professor Iain Crombie, Dr Marie Renaud, Dr Suzanne Schweiger for their contribution to early discussions about this project, and Emma Tatnall for her help with data collection.

No conflict of interest has been declared by the authors.

Funding

This study was funded by a grant from the Scottish Government.
Impact Statement

Because of the known link between pre-pregnancy drinking and continued drinking during pregnancy it is important to obtain an accurate alcohol history when a pregnant woman first seeks professional support. The Retrospective Diary (RD) allows for a women’s patterns of drinking to be ascertained, as well as her overall levels. This is crucial if potentially alcohol-exposed pregnancies are not to be missed. The RD’s focus on drinks rather than units of alcohol offers a more user-friendly way to explore an individual’s alcohol history. This may also help practitioners who feel nervous about discussing this topic with a pregnant woman.
Abstract

Aims. To evaluate the use of a 7-day Retrospective Diary (RD) to assess peri-conceptual and mid-pregnancy alcohol consumption.

Background. Alcohol consumption among women has increased significantly, and is of international concern. Heavy episodic (‘binge’) drinking is commonplace, and is associated with unintended pregnancy. Pre-pregnancy drinking is strongly associated with continued drinking in pregnancy. Evidence for standardised routine antenatal assessment of alcohol history and current drinking is patchy; consumption patterns are often not identified. Alcohol-exposed pregnancies may therefore be missed.

Design. Cross-sectional study (n=510) in two Scottish health board areas.

Methods. Face-to-face RD administration from February to June 2015 assessing alcohol consumption in peri-conceptual and mid-pregnancy periods. Women were recruited at the mid-pregnancy ultrasound clinic.

Results. Of 510 women, 470 (92.0%) drank alcohol before their pregnancy; 187 (39.9%) drank every week. Retrospective assessment of peri-conceptual consumption identified heavy episodic drinking (more than six units on one occasion) in 52.2% (n=266); 19.6% (n=100) reported drinking more than 14 units per week, mostly at the weekend; ‘mixing’ of drinks was associated with significantly higher consumption. While consumption tailed off following pregnancy recognition, 5.5% (n=28) still drank above recommended daily guidelines for pregnant women.

Conclusion. Significant peri-conceptual consumption levels suggest a substantial proportion of alcohol-exposed pregnancies. Not taking a detailed alcohol history, including patterns of consumption, will result in under-detection of alcohol-exposed pregnancies. The RD offers practitioners a detailed way of enquiring about alcohol history for this population.
SUMMARY STATEMENT

Why is this research or review needed?

- Alcohol consumption in women has increased significantly over recent years, and is a factor in unintended pregnancies. Pre-pregnancy drinking is strongly associated with continued drinking in pregnancy.
- Assessment of alcohol consumption in pregnancy is sensitive because of its known teratogenicity. Concerns exist about the sensitivity of current questionnaires, and of current screening practice by midwives.
- A failure to establish an accurate alcohol history, including consumption patterns, means that some alcohol-exposed pregnancies may not be detected.

What are the key findings?

- Alcohol consumption patterns vary widely in terms of frequency, and amount and types of drink consumed. Over half reported heavy episodic peri-conceptual drinking; one fifth exceeded recommended weekly limits.
- Most drinking occurred at the weekend, and those who mixed their drinks drank on average twice as much as those who did not.
- Using the Retrospective Diary, the pregnant women were able to provide detailed reports of alcohol consumption levels and patterns for the peri-conceptual and mid-pregnancy periods.

How should the findings be used to influence policy / practice / research / education?

- Midwives need to understand the importance of taking a detailed alcohol history, and should be provided with the time and resource to undertake this.
- Pregnant women should be encouraged to monitor their alcohol intake and be aware of the potential dangers of alcohol, particularly in the early weeks of pregnancy.

Keywords

Alcohol consumption, binge drinking, teratogenesis, pregnancy, antenatal, prenatal care, midwives, questionnaires.
Background

High alcohol consumption is a recognised feature across Europe (Popova et al. 2007). Despite the attempts of public health measures to curb excessive drinking, consumption levels remain high, often due to heavy episodic or ‘binge’ drinking (Gilligan et al. 2012, Scottish Government 2012, Glock et al. 2015). While there are well-documented concerns about the accuracy of self-report estimates (Stockwell et al. 2008, Burns et al. 2010) there is also general agreement that consumption levels are high, and indeed Scotland has among the highest rates of consumption and of alcohol-related deaths in Europe (Cook 2012). The gender gap which had seen high consumption as more a problem for men has narrowed in younger drinkers (Guise & Gill 2007, Scottish Government 2015a). Alcohol-related health statistics for women are a growing concern in parts of Scotland (Shipton et al. 2013) where 40% of women aged 16-44 drink above daily and/or weekly recommended levels (Scottish Government 2015a).

Heavy episodic drinking in particular is associated with unintended conception (Naimi et al. 2003), which itself is implicated in delayed pregnancy recognition. Prompt recognition is important if optimal health-related behaviour is to be followed, particularly if the pregnancy was unplanned (Terplan et al. 2014). Edwards & Werler (2006) found a median time to pregnancy recognition of 31 days. If prolonged, the time between conception and pregnancy recognition may be crucial (Parackal et al. 2013) since pre-pregnancy behaviours are likely to persist. Pre-pregnancy drinking is strongly predictive of pregnancy drinking (Skagerström et al. 2011, Mallard et al. 2013), so it is important when taking an alcohol history in pregnancy to include pre-conceptual levels and patterns.

Estimates of alcohol consumption during pregnancy range in Europe from 35-50% in the Netherlands (Health Council of the Netherlands 2005) to 45% in Catalonia (Garcia-Algar et al. 2008) and 63% in Dublin (Barry et al. 2006). The latest UK Infant Feeding Survey data suggest that 40% of pregnant women continue to drink (HSCIC 2012), albeit usually at low levels. One difficulty with obtaining accurate data is that large-scale surveys such as the Infant Feeding Survey are retrospective, estimating pre-pregnancy and pregnancy consumption levels only after the baby’s birth. Problems of recall may also be compounded by social desirability bias (Muggli et al 2015). In addition, some surveys focus on overall consumption levels, not on consumption patterns. Although most women are said to stop drinking once they realise they are pregnant (Parackal et al. 2013), it is evident that some continue to drink despite widespread publicity of the potential problems. Heavy episodic
drinking in particular is associated with teratogenic effects (Khalil & O’Brien 2010) ranging from miscarriage during first trimester (Kesmodel et al. 2002) to oral clefts (Meyer et al. 2010) to fetal alcohol syndrome (FAS) (Khalil & O’Brien 2010) and fetal alcohol spectrum disorder (FASD), and a higher stillbirth risk (Ornoy & Ergaz 2010).

However, a lack of firm evidence has led to conflicting advice about whether there is a ‘safe’ level of alcohol consumption at any stage of pregnancy (Ornoy & Ergaz 2010; Mather et al. 2015). Nordic countries take the ‘precautionary principle’: given that there is no evidence of a safe limit, complete abstinence is advocated (Leppo et al. 2014). In the UK the message is less clear cut. Duncan et al. (2012) note that the message has changed over time, and varies depending on which health agency or media outlet is offering the advice. The Royal College of Obstetricians and Gynaecologists advises women to abstain, and especially in the first three months of pregnancy (RCOG 2015), a position endorsed by the Scottish Government (2015b) and the Royal College of Midwives (RCM 2015). However, while the National Institute for Health and Care Excellence (NICE), a non-departmental body sponsored by the Department of Health for England, also recommends abstinence, it goes on to advise women who continue drinking that they should drink “no more than 1 to 2 UK units once or twice a week” (NICE 2014: 18). The difference in advice is marginal, but any difference is potentially confusing.

Uncertainty from mixed messages is compounded by a lack of consensus over optimum assessment of alcohol consumption. This is typically made at the first antenatal ‘booking’ visit, but the stigma associated with drinking during pregnancy (Muggli et al. 2015) may lead to under-reporting (Phillips et al. 2007). Many different questionnaires such as TWEAK and T-ACE (Russell 1994) have been tried in maternity care in the UK, but concerns have been expressed concerning TWEAK’s sensitivity (NHS HS 2010). Savage et al. (2003) note that several standard measures including TWEAK and T-ACE focus on alcohol dependence rather than levels and patterns of consumption, a focus which may miss clinically significant but non-dependent consumption. Burns et al.’s (2010) systematic review found that TWEAK’s performance as a stand-alone tool was questionable and some areas have recently replaced it with AUDIT (WHO 2003) or its three-question version AUDIT-C (Bush et al. 1998). However, although AUDIT can identify the existence of heavy episodic drinking (Savage et al. 2003), it does not determine when this occurred, which in pregnancy terms is problematic because of the different teratogenicity associated with alcohol exposure at different gestations (Whitty & Sokol 1996).
Despite these various attempts to furnish midwives with an effective tool, some practitioners are said to be uncomfortable about asking alcohol-related questions (Nevin et al. 2002), and there is evidence that some midwives feel inadequately trained in this regard (Gilinsky 2010, Winstone & Verity 2015). If information about overall consumption levels and of the pattern of drinking is incomplete or missing this makes the targeting of sensitive interventions much harder. Improving the accuracy of assessment is crucial.

Over the years various instruments have been produced to try and encourage accurate reporting, including Sobell and Sobell’s (1995) TimeLine FollowBack (TLFB) approach which tracks consumption on all ‘drinking days’ through a pictorial diary. Similar to this is the well-established Retrospective Diary (RD) approach (Shakeshaft et al. 1999; Gmel & Rehm 2004). This has been shown over time to work effectively in various populations (Werch 1989; Heeb & Gmel 2005), but not to our knowledge with pregnant women in the UK. For this reason we tested the utility of a RD questionnaire against standard instruments in two health board (HB) areas of Scotland.

Because of the crucial link between pre-pregnancy and pregnancy drinking we focussed on the time before the pregnancy started (or before the woman knew she was pregnant) as well as the pregnancy period itself. Elsewhere we report on the correlation of the RD and the existing alcohol questionnaires routinely used in the study sites (AUDIT-C and AUDIT), as well as its relationship with hair alcohol metabolites and measures of maternal wellbeing. This paper reports on the identification by the RD questionnaire of alcohol consumption levels and patterns in relation to i) peri-conceptual and ii) mid-pregnancy consumption in women from two health board areas of Scotland.
The Study

Aims

We aimed to evaluate a retrospectively applied 7-day Retrospective Diary measuring alcohol consumption among pregnant women concerning the peri-conceptual period and a recent mid-pregnancy week.

Design

A cross-sectional study located in the ultrasound scan clinics in two Scottish health boards. Our sample size calculation (95% confidence), based on the latest available Scottish births data, estimated a total sample of 456 women to detect a 5% proportion drinking more than 14 units a week peri-conceptually. Potential participants were sent an invitation letter one week before their planned scan appointment.

Participants

Pregnant women attending their mid-pregnancy ultrasound scan between February and June 2015. Researchers obtained consent after discussion in a private room before or immediately following the scan, whichever was convenient. Those consenting received a £10 ‘thank you’ voucher.

Data collection

Women completed paper-based questionnaires face-to-face with the researcher. These comprised a socio-demographic data form; the DASS-21 (Lovibond & Lovibond 1995); the local standard questionnaire (either AUDIT-C or AUDIT); and two RD forms: RD1 for the peri-conceptual period (“phrased as “Before you were pregnant / before you knew you were pregnant”), and RD2 for a recent typical week. The RD forms identified if the women drank at all; if so, whether they had a ‘typical’ drinking pattern; on what days of the week they would ever drink; whether they drank on their own or with others; and what they drank on ‘drinking days’. The RD generated daily and weekly unit consumption totals which were used to identify when and by how much women drank in excess of recommended levels. ‘Flashcards’ - visual cues of actual-size drinks - were used to prompt recall and accuracy over
drink sizes. All forms were subsequently entered onto a laptop Excel file which calculated alcohol unit totals.

Ethical considerations

Women under 16 and those deemed unable to understand the study and complete the questionnaires were ineligible. Women were not approached if clinic staff indicated an anomaly had been identified, or if the woman appeared upset. Ethical approval was granted by the East of Scotland Research Ethics Committee 1 (ref. 14/ES/0023).

Data analysis

We set three cut-offs for peri-conceptual drinking: ‘6 or more units on any one occasion’ (the definition of a binge); ‘More than 14 units a week’ (up to 14 being ‘lower risk’ for women; NICE 2010); ‘More than 21 units a week’ (up to 21 being ‘lower risk’ for men; NICE 2010). For drinking since pregnancy recognition, we used two cut-offs based on NICE (2014) advice: a maximum of two units on any one day, and a maximum of four units in a week.

Normality of distribution of continuous data was assessed by visual histogram inspection, examination of the coefficient of skewness and application of the Shapiro-Wilks test. Between-group comparisons of continuous data were made using Student’s $t$ test for plausibly normal data, and the Mann-Whitney test for skewed data. $\chi^2$ was used for categorical variables. Cohen’s $\kappa$ was estimated as a measure of agreement between categories of excess peri-conceptual and pregnancy consumption as measured by RD and AUDIT-C / AUDIT questionnaires. Significance was set at $p <0.05$. Simple descriptives were used to present data on the days in which alcohol was taken and the types and amounts of drink consumed.

Validity, reliability and rigour

The study protocol was reviewed by the Scottish government (as funder) and our steering group consisting of experienced alcohol researchers and a lay person. To ensure consistency of approach training in recruitment and interview skills was provided for the researchers, whose experiences were reviewed at monthly meetings. By assessing the RD – a well-used instrument - against existing standard questionnaires we were able to assess reliability.
Consistency of response using different tools also suggested good validity but we stress that we did not seek formally to validate this tool within a pregnant population.
Results

In total 510 women were recruited, slightly exceeding our target because of the need to continue recruiting to reach our hair samples quota. When compared with a random sample of women attending that clinic, questionnaire respondents were found to be similar in terms of age, deprivation score (Scottish Government 2012) and ethnic group, but were more likely to be primiparous and, in one of the health board areas only, to be smokers. Detailed socio-demographic and other personal data are reported in another paper.

Frequency of alcohol consumption

We first established whether women drank at all, the frequency of drinking patterns if they did and whether they continued to drink once they knew they were pregnant. While 187 (39.9%) said that before becoming pregnant they would drink alcohol at least once every week, most said that they interspersed such ‘drinking weeks’ with ‘non-drinking weeks’. Alcohol consumption dropped sharply following pregnancy recognition (Table 1):

Table 1  Overall prevalence and frequency of alcohol consumption

<table>
<thead>
<tr>
<th>Do you drink alcohol at all? - Yes</th>
<th>Peri-conceptually</th>
<th>Since pregnancy recognition</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (%)</td>
<td>N (%)</td>
<td></td>
</tr>
<tr>
<td>470/510 (92.0%)</td>
<td>92/510 (18.0%)</td>
<td></td>
</tr>
<tr>
<td>Frequency of ‘drinking weeks’*:</td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td>Every week</td>
<td>187 (39.9%)</td>
<td>16 (17.4%)</td>
</tr>
<tr>
<td>Every 1.5 – 4 weeks</td>
<td>166 (35.4%)</td>
<td>9 (9.8%)</td>
</tr>
<tr>
<td>Every 4.1 – 8 weeks</td>
<td>42 (9.0%)</td>
<td>12 (13.0%)</td>
</tr>
<tr>
<td>Every 8.1 – 13 weeks</td>
<td>36 (7.7%)</td>
<td>6 (6.5%)</td>
</tr>
<tr>
<td>Every 13.1 – 26 weeks</td>
<td>23 (4.9%)</td>
<td>49 (53.3%)</td>
</tr>
<tr>
<td>Every 26 weeks or more and over</td>
<td>15 (3.2%)</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Alcohol consumption was heavily centred on Fridays and Saturdays (Figure 1). Figures add up to more than 100% as some women drank on more than one day a week.
Exceeding recommended limits

Over half the participants admitted to drinking above recommended daily limits at least occasionally in the peri-conceptual period; over a fifth did so weekly (Table 2). Twenty-eight women (5.5%) said they had drunk more than the recommended two units a day since finding out they were pregnant (Table 2):

Table 2  Frequency of drinking in excess of recommended UK limits

<table>
<thead>
<tr>
<th></th>
<th>Pre-pregnancy / pre-pregnancy diagnosis</th>
<th>During pregnancy (since finding out was pregnant)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In excess: &gt;6 units on any one day</td>
<td>In excess: &gt;14 units weekly</td>
</tr>
<tr>
<td>Numbers (and %/age) drinking above recommended limits</td>
<td>266</td>
<td>52.2%</td>
</tr>
<tr>
<td>Every week</td>
<td>111</td>
<td>21.8%</td>
</tr>
<tr>
<td>Every 1.5 – 4 weeks</td>
<td>96</td>
<td>18.8%</td>
</tr>
<tr>
<td>Every 4.1 – 8 weeks</td>
<td>29</td>
<td>5.7%</td>
</tr>
</tbody>
</table>
We assessed whether drinking at certain levels peri-conceptually was associated with continued pregnancy drinking. Drinking more than six units on a single occasion peri-conceptually was not associated with whether women continued drinking following pregnancy recognition ($\chi^2=2.76; p=0.096$) but it was associated with exceeding the recommended pregnancy upper limit of two units on a single occasion ($\chi^2=5.73; p=0.017$). Exceeding the normal 14-unit weekly recommended limit was not associated with either outcome (drinking at all - $\chi^2=3.43; p=0.064$; drinking more than two units $\chi^2=0.02; p=0.962$). Drinking in excess of 21 units peri-conceptually was associated with drinking at all in pregnancy ($\chi^2=7.52; p=0.006$), but not with drinking more than two units on a single occasion ($\chi^2=1.49; p=0.221$). Five women said they drank six or more units on a single occasion following pregnancy recognition (range 8-14 units).

Six women admitted to drinking on their own peri-conceptually; one also said she drank on her own during pregnancy. All others said they only drank with family and/or friends.

*Types of alcohol*

The RD asked women to specify what types of alcohol they drank. On Saturday (the highest consumption day) 196 women drank varying amounts of wine, and 177 drank spirits (Figure 2):

<table>
<thead>
<tr>
<th>Every 8.1 – 13 weeks</th>
<th>16</th>
<th>3.1%</th>
<th>5</th>
<th>1.0%</th>
<th>1</th>
<th>0.2%</th>
<th>3</th>
<th>0.6%</th>
<th>0</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Every 13.1 – 26 weeks</td>
<td>11</td>
<td>2.2%</td>
<td>3</td>
<td>0.6%</td>
<td>2</td>
<td>0.4%</td>
<td>13</td>
<td>2.5%</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Every 26 weeks or more</td>
<td>3</td>
<td>0.6%</td>
<td>1</td>
<td>0.2%</td>
<td>1</td>
<td>0.2%</td>
<td>0</td>
<td>-</td>
<td>0</td>
<td>-</td>
</tr>
</tbody>
</table>

**Figure 2**  Number of women drinking different types of drink on a Saturday (peri-conceptual)
Nearly two-fifths of these women (n=145; 38%) said they drank more than one type of alcohol. Of the 110 who ‘mixed’ and who drank spirits (the most common drink for those ‘mixing’) 46 (42%) also drank shots, 42 (38%) drank wine, 19 (17%) drank ‘Alcopops’, 16 (15%) drank beer, and 11 (10%) drank cocktails. Women who combined different types of alcohol on a Saturday consumed more units on average than those who drank only one type of alcoholic drink: 11.2 units compared with 5.6 (Mann Whitney U=6761.0; Z=-9.824 p<.001). This mirrored the Friday night pattern (on average 11.6 units for those mixing drinks compared with 5.5 who didn’t; U=645.5; Z=-5.122; p<.001).

How many drinks?

The researchers administering the RD reported that the ‘flashcards’ often prompted women to increase the reported amount consumed at home with regard to glasses of wine (small to medium; medium to large), and to a lesser extent for spirits. The median number of units consumed on a ‘drinking day’ ranged from 3.4 (on Mondays and Thursdays) to 5 on Fridays, and 6.8 on Saturdays. In terms of numbers of drinks consumed on a Saturday by individual women, the greatest range was seen in spirits, ‘shots’ and beer (Figure 3):
Of the 92 women who admitted to drinking following pregnancy recognition, 55 were classified as occasional or frequent heavy episodic drinkers pre-pregnancy (i.e. consumed six or more units on one occasion), and 25 drank above recommended weekly limits (14 units). Of the 28 women who said they drank in excess of two units a day following pregnancy recognition, 23 had admitted to heavy episodic drinking before they knew they were pregnant. The remaining five had reduced consumption from moderate levels but had not stopped altogether.
Discussion

The association between pre-pregnancy alcohol consumption and continuing drinking during pregnancy is well attested (Palma et al. 2007, Skagerström et al. 2011, Mallard et al. 2013), with binge drinking before pregnancy being a particular risk factor (Ethen et al. 2009). Scotland’s troubled relationship with alcohol has also been noted (Shipton et al. 2013, Scottish Government 2015a).

Our cross-sectional mid-pregnancy study using 7-day Retrospective Diary (RD) in two Scottish health board areas obtained detailed reports of peri-conceptual and mid-pregnancy drinking levels and patterns. These showed that drinking before pregnancy or pregnancy diagnosis was heavily concentrated at the weekend, with significant numbers of women exceeding daily and/or weekly recommended upper limits. Heavy weekend drinking is well documented, particularly among the young (Neighbors et al. 2007, Kuntsche & Cooper 2010), with the rise in female consumption levels being of particular concern (Measham & Østergaard 2009). This study found a lower incidence of drinking during pregnancy than some other reports from across Europe (Health Council of the Netherlands 2005, Barry et al. 2006, Garcia-Algar et al. 2008). While any self-report such as ours is liable to claims of social desirability bias or denial (Davis et al. 2010), the information obtained through the RD allows for a thorough exploration of drinking habits. It is interesting to note that the TimeLine Follow Back (TLFB) approach (Sobell & Sobell 1995) is quite similar in that it tracks consumption on all ‘drinking days’ through a pictorial diary which prompts recall and response. The TLFB has demonstrated good sensitivity in a range of formats (Collins et al. 2008, Pedersen et al. 2012) and has been used during pregnancy in Canada (Fraser et al. 2012) and in Sweden where it obtained an “unexpectedly high 15% prevalence of risk use of alcohol during early pregnancy” (Magnusson et al. 2005: 161).

Obtaining accurate information on patterns as well as levels of consumption is a necessary first step in identifying the likelihood of an alcohol-exposed pregnancy, since pre-pregnancy consumptions levels are strongly predictive of consumption during pregnancy. There are also concerns that practitioners lack confidence in approaching this topic (Nevin et al. 2002, Gilinsky 2010) and that existing screening tools are either not being used appropriately (Payne et al. 2014) or are not sensitive (Burns et al. 2010). Indeed, elsewhere we report that the participants in this study admitted to much higher peri-conceptual consumption when
completing the RD than when completing the standard alcohol questionnaires (AUDIT and AUDIT-C).

Detailed evidence about how midwives in the UK approach these issues is lacking but some local studies have identified inconsistent practice (Winstone & Verity 2015). If standard tools, when used, are administered in different ways (as in Payne et al.’s study) and those tools themselves have questionable sensitivity, or do not provide information on the timing of potentially hazardous drinking, then clinically significant consumption may be missed.

In both the peri-conceptual and mid-pregnancy periods most drinking occurred at the weekend, with wine and spirits being the most popular drinks. Mixing of drinks was commonplace, and was associated with significantly higher consumption. Our study found that those who drank more than six units on one occasion peri-conceptually and those who drank in excess of 21 units per week peri-conceptually were more likely to continue drinking during pregnancy, but the association was not absolute, and we did not formally assess the predictive values of these variables.

In the UK the first opportunity to assess a pregnant woman’s alcohol history is likely to be when she attends her antenatal ‘booking’ visit, usually at around 10-12 weeks’ gestation. It is clearly important to take an accurate alcohol history at this stage, but the evidence on how comfortable or effective midwives are with asking such questions is thin. While Jones et al.’s (2011) small-scale Australian survey found that midwives were confident in this regard, they lacked knowledge about risk levels. Practitioners elsewhere appear not to be so confident (Nevin et al. 2002, Gilinsky 2010), and Payne et al.’s (2014) larger Australian survey found that many midwives did not use the recommended AUDIT tool or offer a brief intervention when indicated. Despite the inclusion of thumbnail images on the AUDIT form explaining the unit content of different drinks there is evidently confusion in the general public over what units mean (Lovatt et al. 2015). Indeed, some of the women expressed confusion over this; focussing on the type and number of drinks seemed to be more straightforward for the women. The incorporation of the ‘flashcards’ seemed to encourage accuracy and detailed reporting.

The RD can be used to gauge consumption over varying periods of time. We opted for a one-week period as this seemed to offer a better opportunity of encouraging accurate recall (Hoeppner et al. 2010), and indeed we found evidence of significant peri-conceptual heavy episodic drinking which was not picked up by the standard tools. Over one fifth of
respondents admitted to exceeding recommended daily limits for non-pregnant women at least once a week, and 11% drank in excess of recommended weekly limits on a weekly basis. Women who drank different forms of alcohol consumed much more on average than those who drank only one type. While the existence of hazardous and sustained drinking above recommended levels among women of childbearing age is well documented (Popova et al. 2007; Scottish Government 2015a), it is concerning that this is still prevalent in women leading up to and even after the time of conception.

In the UK, women planning to get pregnant are advised not to consume alcohol once they conceive (NICE 2014). However, it was evident that some participants had experienced mixed messages about alcohol, both before and following conception. It is possible for a woman to ‘binge drink’ (defined in the UK as at least six units or more on one occasion (NHS Choices 2014; RCOG 2015) twice a week and yet remain under the NICE (2010) recommended weekly limit for women of 14 units). Recommended daily limits have been introduced to address this anomaly (DH 2008), but it is apparent that understanding of recommended limits is incomplete (House of Commons STC 2012).

We did not ask the participants at what stage they realised they were pregnant, or whether the pregnancy was planned. National data on the incidence of unintended conception are difficult to determine, but regional data suggest a rate of 38% in Northern Europe and 34% in Western Europe (Sedgh et al. 2014). Figures in the USA are higher, with around half of all pregnancies reported to be unintended (Finer & Henshaw 2006, Finer & Zolna 2014). Pregnancy recognition is likely to be delayed in many such cases, with consequent failure to adopt healthy behaviours. Tough et al.’s (2006) Canadian study found that while 80% of women said they drank alcohol before pregnancy, 50% admitted they did so in the early stages of pregnancy before they realised they were pregnant. The early days and weeks of a pregnancy are a time of rapid organ development, and the potential teratogenic effects of continuing heavy episodic drinking are a matter of concern (Khalil & O’Brien 2010, Mather et al. 2015).

The antenatal ‘booking’ visit may be the first time the pregnant woman has ever been asked questions about alcohol intake. Practitioners performing this assessment need to have the requisite knowledge and skills to do so, but concerns over the apparent sensitivity of some standard screening tools (Savage et al. 2002) raise questions about how effective this will be. While the RD takes longer to administer than either AUDIT or AUDIT-C, it encouraged greater honesty about heavy episodic and sustained consumption (data reported in another
paper). Improving the sensitivity of screening tests is vital if appropriate interventions are to be delivered. A tool which gets closer to the truth, particularly about hazardous consumption levels, is to be welcomed. Who carries out this screening can be questioned; at a busy antenatal booking visit midwives may complain that they have insufficient time. Kishore et al.’s (2011) US study found that medical assistants were an effective substitute for delivering brief alcohol screening and interventions. While the setting is different, one of the blocking factors – lack of practitioner time – is common to both. We concede that persuading those organising busy antenatal clinics to set aside ten minutes for taking an alcohol history is not an easy task.

Determining overall consumption levels is clearly important, but so too is identifying the pattern of drinking, not least when constructing health-behaviour advice (Kuntsche & Cooper 2010). The RD has the scope to recognise such features. We identified variation in how often ‘typical’ drinking weeks occurred both before and during pregnancy, and needed to administer a second RD1 questionnaire in some cases to identify atypical additional drinking (such as birthdays, holidays, etc.). Because of their sporadic nature these additional data complicated the overall consumption calculation, and we have not included them here. Our overall estimates of peri-conceptual drinking are therefore an under-estimate as they do not include these additional data.

Whilst most women claimed to stop drinking once they realised they were pregnant (cf. Parackal et al. 2013), a small proportion continued to drink, even above the recommended upper limits (NICE 2014), and some even on a weekly basis. The association between heavy episodic peri-conceptual drinking and consuming more than the recommended levels during pregnancy was not absolute, but assessments of both are required. If some midwives feel inadequately trained to do this, or believe they do not have sufficient time, then potentially hazardous and/or teratogenic consumption may be missed. If health services are serious about tackling alcohol abuse then sufficient resources must be allowed to make accurate assessments at this critical time.

Limitations

This study only included two Scottish health board areas; we cannot say whether similar results would be found elsewhere. The study areas do not have great ethnic diversity. The 7-day diary, as administered here in a retrospective manner, is open to the same criticism as
many other alcohol assessment tools. Our identified figure of 18% drinking in pregnancy is somewhat lower than other UK estimates, although clinical staff in one of the areas confirmed that the abstinence message is strongly advocated there, and thought the figure to be an accurate estimate. While we cannot rule out the possibility of social desirability bias, the fact that the women admitted to significantly more drinking when completing the RD than when completing the standard tools does suggest that the RD off-sets this.

We did not ask about unplanned pregnancy or about the timing of pregnancy recognition. Doing so might have clarified the distinction between pre- and post-conception drinking.

Conclusion

We found some evidence to confirm the wider literature’s conclusion about the link between pre-pregnancy and pregnancy drinking, particularly when infrequent but heavy. These significant levels of peri-conceptual consumption suggest a substantial proportion of alcohol-exposed pregnancies. However, if the woman stops drinking once aware she is pregnant, and if the midwife’s alcohol screening at the antenatal booking clinic does not delve into the peri-conceptual period, the midwife may consider her low risk and a potentially alcohol-exposed pregnancy may go unrecognised.

One harm prevention strategy could focus on not mixing drinks as women who did this tended to drink heavier quantities, perhaps due to losing track of units and drinks. Existing screening instruments, even when administered correctly, do not capture well the complexity of drinking patterns. As we found, some women can binge drink without exceeding recommended weekly pre-pregnancy limits. The Retrospective Diary offers a detailed way of enquiring about alcohol history for this population.
References


