



ALCOHOL CONSUMPTION BY PREGNANT WOMEN IN THE WESTERN CAPE

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Objective. To assess alcohol use by pregnant women in three underprivileged areas of the Western Cape.

Design. Data were collected from subjects, selected in a randomised manner, during a single, structured interview.

Subjects and setting. Interviews were conducted among pregnant women voluntarily attending selected antenatal clinics in the George/Oudtshoorn, Vredenburg/Saldanha, and Cape Metropole areas of the Western Cape.

Outcome measures. On completion of the interview, women at risk were counselled with regard to the dangers of prenatal alcohol exposure to the fetus.

Results. 42.8% of the women in the sample admitted to varying degrees of alcohol ingestion during the current pregnancy. The reported alcohol intake of over 55% of these women, i.e. 23.7% of the sample, was sufficient to place their unborn children at high risk for the fetal alcohol syndrome (FAS). These heavy drinkers followed a pattern of binge drinking over weekends and showed a marked preference for beer. Combined alcohol and tobacco use occurred in 29.6% of the sample. Only one subject admitted to using marijuana.

Conclusion. The data in this study confirm that a high rate of alcohol and tobacco use prevails among pregnant women in poorer communities of the Western Cape. Extrapolating from experience, as many as 9.5% of the sample may produce children with FAS.

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during pregnancy on the fetus.² Higher stillbirth and neonatal death rates were noted, as well as the increasingly poor outcome in successive pregnancies.³ More recently in France, Lemoine and colleagues⁴ published their findings in a study of 127 children born to alcoholic mothers. However, it remained for Jones, Smith and co-workers⁵ in 1973 to delineate the particular pattern of malformations resulting from prenatal alcohol exposure as the fetal alcohol syndrome (FAS).

In the Western Cape province of South Africa, child health care workers have been aware for many years that FAS is a common paediatric disorder, characterised by features of mental retardation, growth disturbances and characteristic facial dysmorphism. The frequency of alcohol abuse among certain sectors of the population, particularly agricultural workers,⁶ has been well documented. Following a 12-month survey of births at Somerset Hospital, Cape Town in 1985, Palmer⁷ reported the frequency of FAS as 1/281 live-born infants. Other anecdotal reports have emphasised an apparent increase of FAS in the poorer socio-economic communities of this region.⁸ However, to date no other epidemiological data have been available regarding the frequency of FAS, and the drinking habits of pregnant women from this region have not been assessed. In order to improve planned prevention measures and to assess their effectiveness in these communities, a health survey assessing alcohol use was conducted among pregnant women attending routine antenatal clinics in three regions of the Western Cape.

PATIENTS AND METHODS

A prospective survey of alcohol ingestion in pregnant women in rural and urban areas of the Western Cape was undertaken from May 1995 to July 1996. The study sample comprised 636 pregnant women voluntarily attending 17 antenatal clinics, of which 6 were from the Cape Metropolitan area, 3 from the Vredenburg/Saldanha region and 8 from the George/Oudtshoorn area. The clinics were chosen to reflect some of the poorer socio-economic communities of the areas.

Each woman included in the study was interviewed once only by a single interviewer (JC) before her routine antenatal examination by a midwife. Care was taken not to disrupt the normal activities of the clinic. For this reason, women were selected from those waiting to be examined by a midwife according to a ratio of the number of midwives actively examining women on any given day. The women were selected according to the number routinely assigned to them on arrival at the clinic, indicating their order in the queue. Thus, every woman was selected before any personal information about her could be noted by the interviewer. Only one of the women approached (in the George/Oudtshoorn area) refused to participate in the study. The interviews were conducted in the woman's language of preference in the privacy of a separate room after informed consent had been obtained. In some

Historically, the potential teratogenicity of alcohol has been suspected for thousands of years, with biblical and Carthaginian references prohibiting bridal couples from drinking on their wedding night for fear of producing a defective child.¹ In 1899, following a study of jailed, alcoholic women and their offspring, Sullivan reported the earliest scientific work on the effects of maternal alcohol ingestion

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instances, a Xhosa interpreter helped with the interview.

In this manner, demographic details were obtained together with a previous medical and obstetric history. Personal habits with regard to cigarette smoking, alcohol consumption, drug use and eating practices were recorded. Health data for the current pregnancy were also documented.

The data collected were entered and analysed on a database using Windows 3.1, Microsoft Access 2.0. Microsoft Excel 5.0 was used to calculate the results of the statistical tests. Alcohol intake was recorded in units of alcohol equal to 10 ml of absolute alcohol (AA). The latter was equivalent to 200 ml clear beer, 100 ml wine, 30 ml spirits and 50 - 60 ml fortified wine. Drinking was categorised as minimal (< 5 units AA/week), moderate (5 - 10 units AA/week or binges of 5 - 10 units/occasion), or heavy (> 10 units AA/week or binges of > 10 units per occasion).

A detailed analysis of maternal alcohol intake was performed, and the extent to which this was influenced by various factors was considered. For this purpose, the data were arranged in contingency tables. The null hypothesis assumed that the frequencies of observations occurred independently of each other. Chi-square analysis was automatically calculated using observed and expected frequencies by means of the Microsoft Excel 5.0 programme.

RESULTS

Demographic data

Two hundred and fifty-six women were interviewed in the Cape Metropole (40.3%), 191 in the George/Oudtshoorn district (30.0%) and 189 in the Vredenburg/Saldanha clinics (29.7%). The ages of the 636 women showed a normal distribution for this population (see Fig. 1), with the majority being 20 - 30 years of age. Most of the women were of mixed ancestry ($N = 549$, 86.3%) with only 85 black women (13.4%) and 2 white women (0.3%) interviewed. Of the women 267 (42%) were married, 362 (57%) were single, and 7 (1%) were divorced.

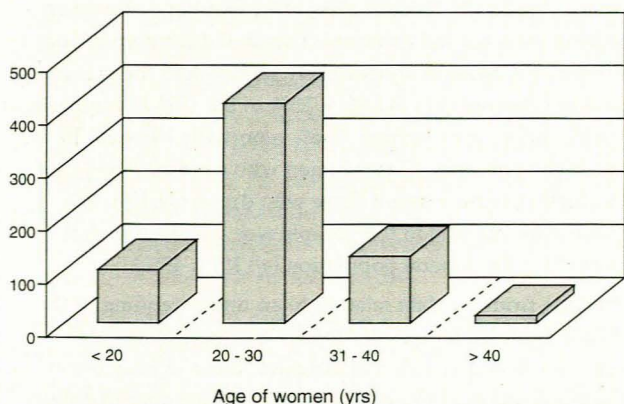


Fig. 1. Age distribution of women interviewed.

Religious affiliations were allocated as Christian (both traditional denominations and more obscure groups), Muslim, or other (e.g. agnostic). These broad categories were represented by 463 (72.8%), 73 (11.5%), and 100 (15.7%) women, respectively. Levels of maternal education are indicated in Fig. 2. Almost half the women (49.2%) had between 8 and 10 years of formal education.

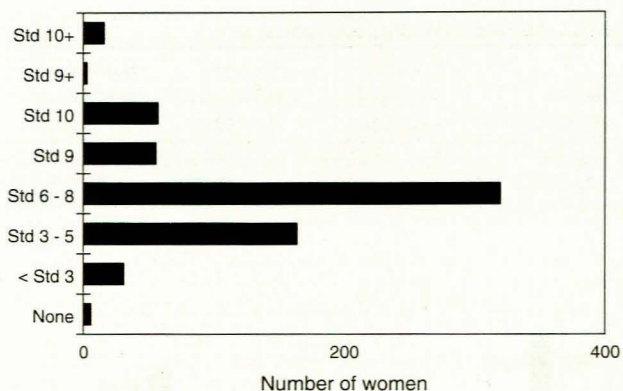


Fig. 2. Level of maternal education in sample.

The monthly income of each family group was calculated as the sum of the incomes of all household members, except when the interviewee was lodging with a family that did not contribute to her support. Family size varied considerably and 120 of the women (18.9%) were unsure of the family income. The figures obtained may not reflect the actual financial circumstance of each family. Based on the figures obtained, 42% of the sample had family incomes of < R1 000, 18.9% between R1 000 and R1 500, 10.1% between R1 501 and R2 000 and 5.8% between R2 001 and R2 500. Only 4.6% of the sample had incomes exceeding R2 500.

Alcohol and tobacco use

Of the sample of 636 women, 364 (57.2%) claimed to abstain completely from alcohol use during pregnancy, while 272 (42.8%) admitted to varying degrees of alcohol ingestion. The percentages of abstainers/drinkers for each geographical area are represented in Table I. No statistically significant difference could be detected between the three populations ($P = > 0.05$). Beer was the main type of alcohol ingested (91.5%), followed by wine (8.8%), spirits (4.4%) and exotic alcohols (2.2%). (Note that some of the women drank more than one form of alcoholic beverage.) The patterns of drinking, represented in Fig. 3, demonstrate that throughout all three regions, the women who drank alcohol generally did so in a 'binge' pattern. Almost one quarter of the women in the sample (23.7%) were classified as significant drinkers as they admitted to moderate or heavy alcohol consumption in a binge pattern. No significant difference was found in total alcohol ingestion between the areas, although more women (28%) in the Vredenburg/



Saldanha region were significant drinkers than in George/Oudtshoorn (22.5%) or the Cape Metropole region (21.5%). There was also no significant difference in the age profile of the low- and the high-risk drinkers (9.1% v. 5.3% were over 35 years, 18.8% v. 19.9% were 30 - 34 years, 30.7% v. 29.8% were 25 - 29 years, 30.1% in each group were 20 - 24 years, and 10.3% v. 13.9% were under 20 years old).

Table I. Alcohol intake by geographical area

Alcohol ingestion	Cape Metropole (N = 256)	George/Oudtshoorn (N = 191)	Saldanha/Vredenburg (N = 189)
Drinkers	88 (34.4%)	88 (46.1%)	96 (50.8%)
Abstainers	168 (65.6%)	103 (53.9%)	93 (49.2%)

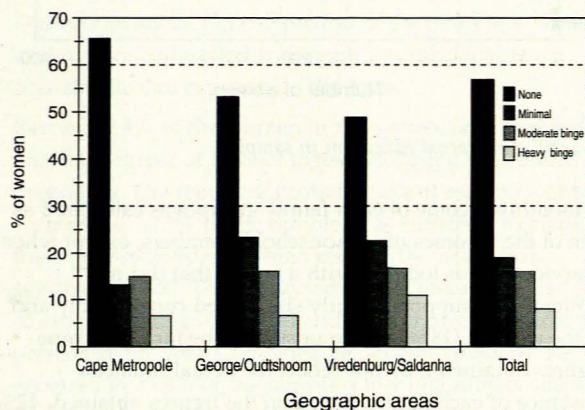


Fig. 3. Pattern of drinking within the sample, area by area.

Within the sample, 290 respondents (45.6%) admitted to smoking, and only 3 of the women used snuff or chewed tobacco. One admitted to using marijuana. When tobacco and alcohol use was assessed in combination (Table II), it was noted that 16% of the women only smoked, 13.2% only drank, and 29.6% admitted to indulging in both practices. The women who claimed to abstain from both alcohol and tobacco accounted for 41.2% of the sample. Apart from the one marijuana user, no other drug use was reported in this sample during pregnancy.

Table II. Substance use within the sample (%)

Substance	Cape Metropole (N = 256)	George/Oudtshoorn (N = 191)	Vredenburg/Saldanha (N = 189)	Total (N = 636)
Tobacco + alcohol	25.8	27.7	36.5	29.6
Tobacco only	22.3	14.1	9.5	16.0
Alcohol only	8.6	18.3	14.3	13.2
No substance use	43.4	39.8	39.7	41.2

Maternal knowledge of substance abuse

The survey asked specifically whether mothers were aware of any factors that were harmful or could cause problems for their fetuses *in utero*. A summary of their responses is shown in Table III and indicates that 59.7% of the women were aware that alcohol could be harmful to the fetus. This awareness was reportedly better in those women who were classified as significant drinkers, with 88.1% of this particular group indicating an awareness in this regard.

As these trends became apparent during the data collection, the women were asked to explain the effect on the fetus of each particular substance they mentioned. It was found that 35.6% (21/59) of the significant drinkers had a degree of insight, ranging from minimal to excellent knowledge, of the potential teratogenic effects of alcohol. In contrast, only 22.8% (47/206) of the women who reportedly did not drink or only drank minimal amounts of alcohol indicated any insight in this regard.

DISCUSSION

The survey is one of the first among poor socio-economic communities in South Africa to address specific issues regarding substance abuse during pregnancy. All the women participated voluntarily in the study and appeared frank and open in their answers. Although this assessment is largely anecdotal, it is very different from responses to similar surveys in First-World nations.^{9,10} In the latter, refusal to answer questions or obvious under-reporting of alcohol and tobacco use is prevalent, for reasons probably relating to stigmatism, fear of loss of medical benefits, or legal liabilities. These factors make the South African context a potentially good field for more accurate data collection, especially for dose-related and timing effects of alcohol on the fetus.

The proportion of women from the three geographical areas was almost equal, allowing inter-regional differences to be assessed. Alcohol ingestion appeared slightly heavier in the West Coast area of Vredenburg/Saldanha, but the difference was not significant. Nevertheless, the percentage of women imbibing even limited amounts of alcohol during pregnancy in the Western Cape was considerably higher than the percentage found in other surveys (42.8% v. 25% in the USA).¹¹ Similarly, of the 636 women interviewed, 45.6% reportedly smoked. In the Cape Metropole area, those women who smoked (48%) considerably outnumbered those who drank (34.4%). The incidence of smoking in this sample was the same as that reported for the general population (48.1% v. 47%).¹²

Judging from the data relating to an understanding of the possible teratogenic roles of tobacco and alcohol abuse in pregnancy, it is apparent that although some women are aware of harmful effects of these substances on their unborn babies, warnings about the severe consequences have not been



effective to date. The urgent need for appropriate education and prevention programmes is therefore underlined. Where in First-World nations concomitant drug abuse involving marijuana, heroin, crack or ecstasy is a major problem, this is not yet the case among pregnant women in our socio-economically disadvantaged communities.

When considering the demographic details from the data collected in this study, it is apparent that the sample of women studied is mainly of mixed ancestry or the Cape Coloured ethnic group (86.3%), young (20 - 30 years), single (57%), Christian (72.8%), moderately educated (half have Standard 6 - 8) and poor in an economic sense. In the South African political context, these women would fit into the poor socio-economic groups of formerly disenfranchised and marginalised populations. Most of these factors have been shown to be high risk for substance abuse in other world populations.^{13,14} Furthermore, the 'dop system', or part remuneration of farm workers by means of daily allocations of alcohol, was once widely practised on wine farms in the Western Cape. This practice is now unlawful and is only operating on a minority of farms. Nevertheless, the historical consequences of encouraging alcohol abuse among farm labourers are probably immense. It is, therefore, not surprising that in the traditional wine-growing region of South Africa there is a high alcohol ingestion rate among the general population, which extends into pregnancy.

The data in this study confirm that a high rate of alcohol and tobacco use prevails among the poorer communities of the Western Cape. As the antenatal clinics sampled were chosen to represent poorer socio-economic communities where a high incidence of FAS appears to occur, the findings of this study cannot be extended to the general population. Nevertheless, the implication and extent of prenatal alcohol exposure on many children should not be disregarded. No attempt was made to follow up the children born to the high-risk mothers, as the diagnosis of FAS may be extremely inaccurate at birth and can only be made with confidence between the ages of 3 and 10 years. However, extrapolating from the American experience,¹⁵ as many as 40% of those drinking moderately or heavily in the sample of 636 women (i.e. 60 individuals) will produce FAS-affected babies (9.5%). If this frequency of FAS is confirmed by current epidemiological studies among pre-school and school-entry children in the Western Cape, it would represent the highest rate of FAS in a large, general population anywhere in the world. As this is the most common cause of preventable mental retardation worldwide, more resources need to be directed into efforts of prevention and intervention, particularly in the South African context.

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References

1. Spagnolo A. Teratogenesis of alcohol. *Ann Ist Super Sanita* 1993; **29**: 89-96.
2. Streissguth AP, Landesman-Dwyer S, Martin JC, Smith DW. Teratogenic effects of alcohol in humans and laboratory animals. *Science* 1980; **209**: 353-361.
3. Thompson W. Alcohol intake by pregnant women and its dangers. *IPPF Med Bulletin* 1990; **24**: 4.
4. Lemoine P, Harrosseau H, Borterym JP, et al. Les enfants de parents alcooliques: anomalies observées. *Quest Medical* 1968; **21**: 476-482.
5. Jones KL, Smith DW, Ulleland CN, Streissguth AP. Patterns of malformation in offspring of chronic alcoholic mothers. *Lancet* 1973; **1**: 1267-1271.
6. London L. An investigation into the neurological and neurobehavioural effects of long-term agrichemical exposure among deciduous farm workers in the Western Cape, South Africa. Doctorate of Medicine thesis, University of Cape Town, 1995.
7. Palmer C. Fetal alcohol effects — incidence and understanding in the Cape. *S Afr Med J* 1985; **68**: 779-780.
8. Viljoen DL. The fetal alcohol syndrome. *CME* 1997; **9**: 783-790.
9. May PA, McCloskey J, Gossage JP. Fetal alcohol syndrome among North American Indians: epidemiology, issues and research. *NIAAA Research Monographs* (in press).
10. May PA. A comprehensive approach to the prevention of FAS and the other alcohol related birth defects. *International Journal of Addictions* 1995; **30**: 1549-1602.
11. Serdula M, Williamson D, Kendrick J, Anda R. Trends in alcohol consumption in pregnant women 1985 - 1988. *JAMA* 1991; **265**: 876-879.
12. Steyn K, Yach D, Stander I, Fourie JM. Smoking in urban women in South Africa. *S Afr Med J* 1997; **87**: 460-463.
13. Jacobson JL, Jacobson SW. Prenatal alcohol exposure and neurobehavioural development. *Alcohol Health Res World* 1994; **18** (1): 30-36.
14. Abel EL. An update on the incidence of FAS: FAS is not an equal opportunity birth defect. *Neurotoxicol Teratol* 1995; **17**: 437-443.
15. Jones KL. Fetal alcohol syndrome. In: *Smith's Recognizable Patterns of Human Malformation*. 5th ed. Philadelphia: WB Saunders, 1997: 555-558.

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