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Alcohol Consumption and Associated Problems in a Birth Cohort of 15 Year Olds

David M Fergusson (Ph.D.) — **Associate Professor**

Michael T Lynskey (M.Sc.) — **Junior Research Fellow**

L John Horwood (B.A., M.Sc.) — **Research Fellow**

Christchurch Health and Development Study

Christchurch School of Medicine

Christchurch Hospital

CHRISTCHURCH

New Zealand

ABSTRACT

Aims: This study documents patterns of alcohol consumption and alcohol abuse in a birth cohort of 965 Christchurch born children studied to the age of 15 years. Additionally, the study documents the associations between measures of alcohol consumption and a range of other aspects of adolescent development.

Method: Data on patterns of alcohol use, alcohol related problems and other aspects of adolescent development were collected at age 15 years on the basis of self-report, parental reports and official records.

Results: For most sample members the consumption of alcohol was both infrequent (28.4% were classified as non-drinkers and 23.9% had drunk alcohol only once or twice in the preceding year) and moderate. However, 6.7% reported weekly drinking and 3.3% - 6.8% of the sample reported drinking the equivalent of at least 90 mls of pure alcohol on the last or typical drinking occasion. 19.1% of the sample reported experiencing problems as a result of their drinking and 4.9% of the sample met criteria for alcohol abuse. Measures of alcohol consumption were found to be highly associated with measures of daily cigarette smoking, cannabis use, sexual activity, police contact and depression.

Conclusions: While overall levels of alcohol consumption in this cohort were moderate there was evidence of a minority of adolescents who consumed alcohol frequently, in large amounts or who experienced alcohol related problems. Measures of frequent, heavy or problem alcohol use were found to be highly associated with a range of other aspects of adolescent development.

In recent years there have been growing concerns about the rate of psychosocial problems in adolescent populations with these concerns focussing upon early sexual activity, the use of illicit drugs and alcohol abuse among adolescents (1,2). In previous papers we have described the prevalence of early sexual activity (3) and cannabis use (4) in a birth cohort of Christchurch born children studied at age 15 years. These analyses suggested that a sizeable minority of young people have engaged in sexual activity or used cannabis by their 15th birthday. The present paper attempts to extend these analyses by reporting information on patterns of alcohol use and abuse in this cohort and by examining the comorbidities between these and other problem behaviours. The general aims of this paper are:

1. To document the frequency of alcohol consumption in a sample of young people aged 14-15 years.
2. To estimate the amounts of alcohol that are typically consumed by this group.
3. To estimate the largest amount of alcohol consumed on one occasion.
4. To estimate the frequency with which young people report having experienced physical or social problems as a consequence of excessive alcohol consumption.
5. To estimate the comorbidities or associations between adolescent alcohol use and abuse and a range of other aspects of adolescent development including early sexual activity, cannabis use, young offending, tobacco smoking and depression.

METHOD

The data reported here were collected during the course of the Christchurch Health and Development Study. In this study a birth cohort of 1265 Christchurch born children has been studied at birth, four months, one year and annual intervals until the age of 15 years. Details of the overall research design and previous findings of the study have been given by Fergusson et al (5). When sample members were aged 15 years the following information was obtained:

1. Patterns of alcohol consumption during the period from age 14-15 years. When sample members were aged 15 years they were questioned about their alcohol consumption during the last year. This questioning included:

a) The number of occasions that the young person had consumed alcohol in the past year.

b) The amount of alcohol consumed on the last occasion that the young person had drunk alcohol.

c) Estimates of the amount of alcohol consumed on a typical occasion.

d) Estimates of the largest amount of alcohol that the young person had consumed in the last three months.

Estimates of the amount of alcohol consumed were obtained using a questionnaire similar to that used by Casswell et al (6,7) in the measurement of alcohol consumption for young people in the Dunedin cohort. In this questionnaire a series of units was used to secure an estimate of the volume consumed of each type of alcohol. Thus, for beer amounts were measured in terms of glasses, cans, standard bottles or jugs whereas for wine, fortified wine or spirits amounts were measured in glasses or standard bottles. To measure alcohol consumption on a standardised basis the reported amounts consumed were converted to millilitres of pure alcohol using the conversion formulas developed by the Christchurch Psychiatric Epidemiology Study (8).

2. Consequences of alcohol consumption. To assess the extent of alcohol related problems in the sample, the Rutgers Alcohol Problem Index (9) was administered. This checklist comprised a series of 30 items describing possible consequences of alcohol consumption with these problems spanning both the physical consequences of alcohol consumption (e.g., hangovers, vomiting, passing out, memory loss) and social or psychological problems (e.g., aggression, acting in an inappropriate way).

3. Definition of alcohol abuse. This measure was based on a combination of maternal and self reports of problems associated with the use and abuse of alcohol which were used to determine whether or not the child met DSM-III-R (10) criteria for a diagnosis of alcohol abuse. A more detailed account of the measurement of alcohol abuse for this sample has been given in Fergusson et al (11).

4. Measures of other adolescent psychosocial problems. To examine the extent to which the use or abuse of alcohol was associated or comorbid with other aspects of psychosocial adjustment a series of measures of other adolescent behaviours was used. These measures included:

a) Daily cigarette smoking. At age 15 years the sample members were questioned on a series of items relating to their use of tobacco. On the basis of this questioning the sample was classified as either daily smokers or non daily smokers.

b) Cannabis use. At ages 14 and 15 years the teenagers were questioned as to whether or not they had used cannabis within the preceding 12 months. Additionally, in a separate interview, their parents were questioned as to whether or not they were aware if their child had used cannabis. Parental and self reports were combined to form a measure in the young person was classified as having used cannabis if he/she and/or the parent reported that the young person had used cannabis by the age of 15. A detailed account of patterns of cannabis use in this cohort has been provided previously (4).

c) Sexual activity. At ages 14 and 15 years the teenagers were questioned as to whether or not they had engaged in sexual intercourse within the preceding 12 months. A detailed description of sexual and contraceptive behaviours in this cohort has been provided previously (3).

d) Police contact. For cohort members who were resident in the Canterbury region it was possible to obtain details of the frequency of official police contact. Access to these

records was obtained following signed parental consent in which the parent gave the study access to the young person's offending history as recorded in police records and permission to use police records in this way was obtained from National Police Headquarters. For each young person resident in the Canterbury region youth aid records were checked to obtain details of whether he/she had come to official police attention. A full description of this measure has been given previously (12).

e) Depression. When the sample members were 15 years old information was obtained from both parental and self reports on symptoms relating to diagnoses of depression disorders based on the DSM-III-R (10). A full description of the methods used for constructing these diagnoses and the prevalence of disorder in this cohort has been provided previously (11). All data provided by the young persons and parents was obtained following signed and informed consent by both the young person and the parents.

Sample Sizes

The analyses reported here are based on a sample of 965 children for whom complete data were available on patterns of alcohol use at age 15 years. This sample represented 76.3% of the original cohort of 1265 children and 86.5% of all cohort members who were resident in New Zealand at age 15 years.

RESULTS

1. The frequency of alcohol consumption**.**

Table 1 shows the frequency with which sample members reported drinking alcohol during the preceding year. The Table shows that for the majority of sample members, the consumption of alcohol was relatively infrequent with 28.4% reporting that they had not consumed alcohol in the preceding year and 23.9% reporting that they had consumed

alcohol only once or twice in the preceding year. Nonetheless, a sizeable minority of teenagers reported fairly regular alcohol consumption and 6.7% reported drinking alcohol at least once a week.

INSERT TABLE 1 HERE

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2. Most recent and typical amounts consumed.

Table 2 shows two estimates of the typical amount of alcohol consumed on each occasion. The first measure was the young person's reported alcohol consumption on the last occasion that he/she had drunk alcohol. The Table also shows the estimated amount of alcohol that each subject reported drinking on a "typical" occasion.

The Table shows that for the majority of subjects, levels of alcohol consumption were quite moderate and in the region of 50% of the sample reported drinking less than 30 mls of pure alcohol (or the equivalent of one standard bottle of beer) on the last or typical occasion they consumed alcohol. Nonetheless, there was evidence of a minority of teenagers whose drinking on the last or typical occasion involved sizeable amounts of alcohol with in the region of 3.3% to 6.8% reporting consuming more than 90 mls (or the equivalent of three standard bottles of beer) on the last or typical occasion that alcohol was consumed.

INSERT TABLE 2 HERE

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3. The largest amount consumed in the last three months and rates of alcohol related problems.

Table 3 shows estimates of the largest amount of alcohol consumed on one occasion during the last three months. These estimates show that, in confirmation of the results in Table 3, most cohort members who drank alcohol tended to drink only moderate amounts. Nonetheless, there was again evidence of a sizeable minority of teenagers who have consumed what appear to be quite large amounts of alcohol; 8.9% of the cohort reported consuming in excess of 120 mls of pure alcohol (or the equivalent of four standard bottles of beer) on the occasion during the last three months on which they consumed the most alcohol.

INSERT TABLE 3 HERE

Table 4 shows the frequency with which teenagers reported experiencing alcohol related problems in the last year. These problems include both the physical and social consequences of alcohol use. The table shows that 19% of teenagers reported experiencing an alcohol related problem in the last year with 18.4% reporting physical symptoms of excessive alcohol use (vomiting, hangovers, loss of consciousness) and 7.4% reporting social consequences of alcohol use. On the basis of the distribution of problems in Table 4, 4.9% of the sample met diagnostic criteria for alcohol abuse.

INSERT TABLE 4 HERE

As might be expected the risk of experiencing alcohol related problems was closely related to the young person's reported use of alcohol. This issue was analysed using

multiple logistic regression in which the log odds of reporting an alcohol related problem was related to the young persons reported frequency of drinking, typical amounts consumed and largest amount consumed in the last three months. The estimates from this model suggested that:

i) Teenagers who reported that the most alcohol they had consumed in the last three months was in excess of 90 mls of pure alcohol (approximately three standard bottles of beer) had odds of alcohol related problems that were 7.0 times (95% C.I. 4.2 - 11.4; $p<.001$) higher than teenagers who had not consumed this amount in the last three months.

ii) Teenagers who reported drinking more than 30 mls of pure alcohol (one standard bottle of beer) on a typical occasion had odds of alcohol related problems that were 4.3 times (95% C.I. = 2.6 to 6.8; $p<.001$) higher than teenagers who consumed less than 30 mls of alcohol on a typical occasion.

iii) Teenagers who reported drinking at least once a month had odds of 2.6 times (95% C.I. = 1.9 to 4.5; $p<.001$) of reporting alcohol related problems compared to teenagers who drank less than once per month.

Comparison of the frequency of drinking, typical amounts consumed, largest amount consumed and frequency of alcohol related problems for males and females showed the presence of only very small differences in the patterns of alcohol consumption by males and females. There were, however, marginally significant (.10> p>.05) tendencies for males to report slightly heavier consumption levels and females to report slightly higher rates of alcohol related problems.

4. The associations between alcohol consumption, alcohol related problems and other aspects of adolescent adjustment.

To examine the relationship between alcohol consumption and other aspects of adolescent adjustment, measures of alcohol consumption and alcohol related problems were related to a series of measures of other aspects of adolescent adjustment including: daily cigarette smoking, cannabis use, sexual activity, police contact and depression. The results of this analysis are shown in Table 5 which shows the odds ratios between four measures of alcohol consumption (weekly drinking, drinking in excess of 60 mls of pure alcohol on a typical occasion, reporting alcohol related problems and meeting criteria for alcohol abuse) and the five measures of adolescent adjustment. The odds ratios measure the increase in the odds of a given behaviour conditional on the individual's pattern of alcohol consumption. The Table shows:

i) With one exception there were significant associations (p<.05) between measures of alcohol consumption and measures of adolescent problems indicating that young people who drank frequently, heavily, or reported alcohol related problems were at increased risk of other adolescent problems.

ii) The results suggest generally quite strong associations between the use or abuse of alcohol and other substance use behaviours with young people who used alcohol

frequently, reported heavy drinking or alcohol related problems being 6.1 to 18.6 times more likely to report cannabis use or daily cigarette smoking.

iii) Measures of alcohol use were also strongly related to early onset sexual activity with young people who reported drinking frequently, heavily or experiencing alcohol related problems being between 8 and 12.5 times more likely to report the onset of sexual activity by the age of 15 years.

iv) Alcohol use was also related to risks of police contact with young people who reported drinking frequently, heavily or having alcohol problems being between 2.3 and 4.2 times more likely to have had a police contact before the age of 15 years.

v) Finally, there was a tendency for heavy drinking and alcohol problems to be related to depression. Young people who reported heavy drinking, alcohol problems or who met criteria for alcohol abuse were 2.6 to 4.9 times more likely to have experienced a depressive disorder in the preceding 12 months. However, there was no significant association between frequency of drinking and depression.

INSERT TABLE 5 HERE

DISCUSSION

In this paper we have examined patterns of alcohol consumption in a birth cohort of children studied during the period from 14 to 15 years. The aims of this research were to examine patterns of alcohol consumption during this period, to assess the extent to which alcohol consumption led to alcohol related problems and to examine the comorbidities between patterns of alcohol consumption and other aspects of adolescent adjustment. The conclusions of this research are summarised below.

1. Patterns of alcohol consumption in 14-15 year olds

It is clear from the analysis that the consumption of alcohol by 14-15 year olds was relatively common with 72% of the members of this birth cohort reporting use of alcohol in the last year. However, the majority of those drinking alcohol reported infrequent or moderate levels of consumption. Nonetheless, the analysis identified a minority of the sample who engaged in frequent, heavy or problem use of alcohol with: 6.7% of cohort members reporting consumption of alcohol on a weekly basis; 8.9% of the cohort reporting drinking the equivalent of at least 120 mls of pure alcohol on at least one occasion in the past three months; 19.1% reporting that they had experienced at least one alcohol related problem in the past year and 4.9% of the sample meeting criteria for alcohol abuse. The results of this study are generally consistent with the findings of previous studies of alcohol use by New Zealand adolescents (6, 7, 13-15) which have tended to suggest that while the majority of adolescents report infrequent or moderate consumption of alcohol a minority report drinking frequently or heavily. However, exact comparisons between previous studies and the present findings are difficult owing to both differences in measurement methods and limitations in the reporting of measures of consumption.

Males and females showed generally similar patterns of alcohol consumption and rates of alcohol related problems but there were small tendencies for males to report higher levels of consumption and females to report higher rates of alcohol related problems. Predictably, there were strong associations between reports of alcohol consumption and reports of alcohol related problems: teenagers who drank at least once a month had rates of alcohol related problems that were 2.6 times higher than teenagers who drank less than once a month; teenagers who typically consumed more than 30 mls of pure alcohol had rates of alcohol related problems that were 4.2 times higher than teenagers who did not consume this amount and teenagers who reported drinking the equivalent of 90 mls

of pure alcohol in the last three months had rates of alcohol related problems that were 7.0 times higher than teenagers who had not consumed this amount of alcohol.

2. The comorbidities of alcohol consumption and other aspects of adolescent adjustment

In confirmation of the findings of previous studies (16-18) it was found that adolescents who consumed alcohol frequently, reported heavy drinking or alcohol related problems were at increased risks of a range of other adolescent problem behaviours including: increased risks of other substance use and abuse behaviours involving tobacco and cannabis; higher rates of sexual activity and increased risks of police contact for juvenile offending behaviours. In addition, those reporting heavy drinking or alcohol related problems had significantly higher rates of depression in the preceding year. There are several possible explanations for the comorbidities between teenage alcohol consumption and other aspects of teenage adjustment.

First, it may be suggested that the excessive use of alcohol may lead directly to increased risks of behaviours such as cannabis use, sexual activity or police contact as a result of the disinhibiting effects of alcohol. Second, it is possible that these associations arise because the misuse of alcohol in adolescence is symptomatic of more general behavioural tendencies to engage in antisocial, norm violating or risk taking behaviours (16,18). A third possibility is that the associations between alcohol misuse and other aspects of problem behaviours arise because of common social and contextual factors (such as social class or family disruption) which lead to increased risks of a range of adolescent problem behaviours (19). Within the scope of this paper it has not been possible to examine these explanations in detail but in future studies of this cohort we hope to examine the extent to which the clear comorbidities between early alcohol use and other aspects of adolescent adjustment can be explained in the ways suggested above. However, it is clear from these results that, irrespective of the sources of the association between alcohol misuse and adolescent problem behaviours, young people

who use alcohol frequently, heavily or report alcohol related problems are at an increased risk of a wide range of adolescent problem behaviours including substance use, sexual activity, police contact and depression.

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Table 1: Frequency of Drinking in Preceding Year

Frequency of Drinking in Last Year	N	%
Did not drink	274	28.4
Very occasionally (once or twice)	231	23.9
Less than once a month	197	20.4
At least once a month	198	20.5
At least once a week	65	6.7
TOTAL	965	100.0

Table 2: Estimates of amounts consumed on last and typical occasions during the last 12 months

	Last Occasion		**Typical Occasion**	
Mls Pure Alcohol	N	%	N	%
Did not drink	274	28.4	274	28.4
≤ 30 mls	461	47.8	512	53.1
31-60 mls	104	10.8	96	9.9
61-90 mls	60	6.2	51	5.3
91+ mls	66	6.8	32	3.3
TOTAL	965	100.0	965	100.0

Table 3: Largest amount of alcohol consumed on one occasion in last three months

Mls Pure Alcohol	N	%
Did not drink	392	40.6
≤ 30 mls	268	27.8
31-60 mls	120	12.4
61-90 mls	70	7.3
91-120 mls	29	3.0
121+ mls	86	8.9
TOTAL	965	100.0

Table 4: Reports of alcohol related problems in the last year

	N	%
a) PHYSICAL PROBLEMS		
Hangover	133	13.8
Vomited	131	13.6
Fell asleep	70	7.3
Memory loss	35	3.6
Passed out	22	2.3
Any physical problem	178	18.4
b) SOCIAL PROBLEMS		
Behaved in a socially embarrassing/inappropriate way	33	3.4
Behaved aggressively	28	2.9
Drinking led to disputes/ problems with family or friends	7	0.7
Problems with schoolwork	3	0.3
Other social problems	35	3.6
Any social problem	71	7.4
c) ANY PROBLEM	184	19.1
	N = 965	

Table 5: Odds ratios (95% confidence intervals) between measures of alcohol consumption/problems and other adolescent problem behaviours

Measure	Daily Cigarette Smoking	Cannabis Use	Sexual Activity	Police Contact	Depression
Weekly Drinking	9.4 (5.3-16.6)	6.1 (3.4-10.8)	8.0 (4.5-14.0)	2.3 (1.1-4.7)	1.8 (0.8-4.2)
Usually consumes more than 60 mls of pure alcohol or more	10.7 (6.2-18.4)	10.2 (6.1-17.3)	8.3 (4.9-14.2)	2.5 (1.2-5.2)	2.6 (1.3-5.2)
Reports problems associated with alcohol use	18.6 (10.7-32.4)	12.8 (8.0-20.6)	9.4 (5.9-15.2)	2.8 (1.6-4.7)	2.7 (1.6-4.6)
Met criteria for alcohol abuse	18.4 (9.8-34.6)	13.1 (7.1-24.3)	12.5 (6.7-23.3)	4.2 (1.8-9.9)	4.9 (2.4-10.2)