

# Course of DSM-IV Alcohol Dependence in a Community Sample: Effects of Parental History and Binge Drinking

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**Background:** The role of positive family history in the etiology of alcohol dependence has been demonstrated repeatedly but little is known about the effect of this risk factor on the chronicity of alcohol dependence once it has begun.

**Methods:** We studied the effects of parental and sibling history in conjunction with frequency of binge drinking in a sample of 169 community residents who met criteria for DSM-IV alcohol dependence at the baseline interview. Subjects were re-interviewed approximately 1 year later and the status of their alcohol-dependence disorders (remitted or chronic) was determined.

**Results:** Parental history of alcoholism was significantly related to chronicity of alcohol dependence, as was frequency of binge drinking.

**Conclusions:** Failure to find an effect for family history on chronicity would have suggested that the effect was transient, perhaps interacting with time-limited environmental vulnerability. The finding of a positive relationship between family history and chronicity suggests that the relationship between familial/genetic background and alcohol dependence is stable.

**Key Words:** DSM-IV Alcohol Dependence, Family History, Longitudinal Course.

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**F**ACTORS THAT PLAY a role in the onset of a disorder may or may not influence the chronicity of that disorder once it has begun. Whether or not an etiologic factor continues to exert an effect that prolongs chronicity depends on whether the factor is transient or ongoing, and also on the mechanism by which it has an effect. A large body of literature has shown that a high proportion of alcoholics who have been treated for the disorder have a family history of alcoholism (Cotton, 1979). The association of the disorder in biological parents and children remains even when the individuals did not live together (Goodwin, 1979). However, surprisingly little information exists on whether a positive family history for alcoholism affects the course of the disorder once it has begun. A number of cross-sectional studies of treatment samples have shown that family history is associated with an earlier age at onset

of the disorder (Latham, 1985; Volicer et al., 1983), but such research does not address the question of the longitudinal course when studied prospectively, and may be complicated by comorbidity (Hesselbrock et al., 1985). We are aware of only one study with information on this question that was prospectively obtained, the work of Frances et al. (1984). This study showed that Navy men who were hospitalized for alcoholism had poorer subsequent work performance if they had a family history of alcoholism. However, most individuals with alcoholism or alcohol dependence are never treated (Grant, 1996; Hasin, 1994; Regier et al., 1993). Hence, treatment samples may not represent all individuals with alcoholism or alcohol dependence.

Cross-sectional research has also been conducted on family history of alcoholism in large national surveys. These studies showed that a positive family history is associated with a history of alcohol dependence in the respondent (Dawson et al., 1992; Harford et al., 1992), but the studies did not offer information on whether family history affected longitudinal course.

To address the issue of whether a positive family history predicts the course of alcohol dependence in a general population sample, we studied the 1-year course of DSM-IV alcohol dependence in a sample of household residents who met criteria for alcohol dependence at a baseline interview.

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*Received for publication December 15, 2000; accepted January 3, 2001.*

*Supported by NIAAA Grants R01 AA08159 and K02 AA00161, as well as the New York State Psychiatric Institute.*

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## METHODS

### *Sample and Methods*

Subjects for this study comprised a subset of a larger study of household residents of a sociodemographically diverse area near New York City. The methods of the full study have been presented elsewhere (Hasin et al., 1996, 1997a). In brief, households were designated via random digit dialing. Members of each household were randomly designated and screened for eligibility for the study, with oversampling for females. Eligibility (inclusion) criteria included drinking five or more drinks at least once in the year before screening, being between the ages of 18 and 65, and speaking English well enough to participate in the interview. Subjects were screened by telephone for eligibility through a very brief set of questions on general health behaviors such as exercise, smoking, weight, and drinking. Eligibility status and screening were conducted on 81% of the designated households. Eligible subjects were asked to participate in a more extensive in-person interview that provided the baseline diagnostic data for this study. Of those screened and eligible to participate, 92% participated. Of these, 90%, or 876, participated in a second interview approximately 1 year later (mean time between interviews, 13.6 months) that provided the follow-up diagnostic data. There were no statistically significant differences between those followed up and those not followed in terms of age, sex, race, and average ethanol consumption at baseline. The subset of these subjects included in the analyses presented below were the 169 subjects who met criteria for DSM-IV alcohol dependence at the time of their baseline interview (see below for measure of alcohol dependence).

### *Subjects*

In this sample, 58.6% of the subjects were female. The mean age was 30.1 years (56.2% below age 30, 28.4% between 31 and 40, 11.8% between 41 and 50, and 3.6% over 50). Only 9.5% had not completed high school, about 52.7% had a high school diploma or GED, and 37.8% had a college degree (thus the results may not generalize to illiterate or very poorly educated individuals). Minority residents constituted about 20.1% of the sample (76.5% African American, with the remainder Hispanic and other ethnic groups). Most of the subjects (66.3%) worked full time at baseline. More than half (66.9%) were never married, 20.1% were married, and most of the rest were divorced.

### *Measures*

The Alcohol Use Disorders and Associated Disabilities Interview Schedule (AUDADIS) (Grant et al., 1995) was used to assess the symptoms and criteria of alcohol use disorders. The AUDADIS is a fully-structured interview that was designed for administration by lay interviewers in a large NIAAA-sponsored US national survey. In the AUDADIS, the symptoms and criteria of alcohol dependence are covered in detail for the prior 12 months (current) and for the past. Fulfillment on three of seven possible criteria are required to make a diagnosis of DSM-IV alcohol dependence. Consistent with the DSM-IV, AUDADIS diagnoses of alcohol dependence require that symptoms cluster together in time, which represent a syndrome of symptoms. Computer algorithms developed for the AUDADIS operationalize the diagnostic criteria. The follow-up interview was developed for the present study. The alcohol sections of this follow-up version of the AUDADIS were exactly like the AUDADIS described above, except that the time frame was adjusted to cover only the period between the baseline interview and the follow-up.

In a separate study of household residents (Grant et al., 1995), excellent test-retest reliability was obtained for current AUDADIS DSM-IV diagnoses of alcohol dependence ( $\kappa$  equaled 0.82). To demonstrate reliability in the present sample, we conducted an additional test-retest AUDADIS reliability study with 50 subjects who participated in the main study. These subjects were a consecutive series of subjects who received their reliability retest interview approximately a week after they participated in their baseline interview for the study. Reliability for current

DSM-IV alcohol dependence in these 50 subjects was excellent ( $\kappa = 0.81$ ).

The purpose of this substudy was to investigate the course of alcohol dependence rather than drinking or the consequence of drinking or dependence. Thus, the alcohol dependence diagnosis at follow-up was the outcome variable. The same definition of alcohol dependence was used for the follow-up interview that had been used at baseline: three of the alcohol dependence criteria were required to have clustered together in the year before the interview.

Family history of alcoholism was obtained from the family history section of the baseline AUDADIS. Subjects were asked about parents, then about siblings, then about other relatives. The condition was defined for subjects at the beginning of the section as consisting of physical or emotional problems because of drinking, problems with a spouse, family or friends because of drinking, problems at work because of drinking, problems with the police because of drinking (such as drunk driving), or spending a lot of time drinking or being hung over. About 35% of the sample reported that they had a parent positive for alcoholism, while 27% reported a sibling positive. The test-retest reliability of family history in this sample was 0.70 (Hasin et al., 1997b).

Because aspects of the subjects' actual drinking at baseline seemed likely to influence their outcome, we included a variable in the model which represented drinking so that our odds ratio (OR) for family history could be adjusted appropriately if necessary. This variable represented the frequency of consuming five or more drinks per occasion, which we termed "binge drinking." We created the following categories for this binge drinking variable: (1) 1 day or less per month; (2) 2 to 3 days a month; (3) 1 to 2 days a week; (4) 3 to 4 days a week; (5) nearly every day or every day. The percentages of the 169 subjects that fell into these five categories were 26%, 18%, 28%, 17%, and 11%, respectively. Other categories could have been created for this variable from the raw data. However, we found that different levels for the categories did not affect the results (consistent with statistical theory as presented by Agresti (1996), and the categories used appeared the most meaningful clinically.

### *Analysis*

We used a logistic regression model as our main statistical method. In the logistic regression model, the link function employed was the logit transformation, which models the log of the odds of a positive response (here, the odds of remaining dependent). The slope coefficients thus represent the change in the logit for a change of one unit in the corresponding independent variable  $X$  (Hosmer and Lemeshow, 1989). Sex, race, and age were included in the analyses as potential control variables. Adjusted ORs and 95% CIs were calculated for each variable in the model.

## RESULTS

In this sample of 169 household residents with DSM-IV alcohol dependence, 52.7% had remitted at the 1-year point, whereas the remaining subjects remained alcohol-dependent. In univariate comparisons, there were no significant differences in demographic characteristics between those who remitted and those who did not.

Table 1 shows the results of the logistic regression analysis. As shown in the Table, parental history and binge drinking had a significant effect on the chronicity of alcohol dependence. Each increased the chances of chronicity of alcohol dependence at the 1-year point. None of the control variables was significant.

The odds of remaining chronic for those who reported a parental history of alcoholism versus those without, controlling for the remaining variables in the model, were 2.04,

**Table 1.** Family History of Alcoholism and Binge Drinking: Effects on Remission of DSM-IV Alcohol Dependence in Community Residents ( $N = 169$ )

Variable	Parameter estimate	Standard error	Wald $\chi^2$	P-level $\chi^2$	Odds Ratio (95% C.I.)
Sex	0.39	0.35	1.2	.26	1.48 (0.75–2.91)
Age	0.08	0.20	0.15	.69	1.11 (0.76–1.62)
Race	0.22	0.42	0.27	.60	1.42 (0.59–3.43)
Education	–0.25	0.29	0.77	.38	0.78 (0.44–1.37)
Parental history	0.72	0.36	4.10	.04	2.04 (1.03–4.06)
Sibling history	0.03	0.38	0.01	.94	0.97 (0.46–2.06)
Binge drinking	0.38	0.13	8.49	.00	1.48 (1.13–1.90)

with a 95% CI of 1.03–4.06. For a one-unit change in the five-level binge drinking variable, the estimated odds of chronicity, controlling for the other variables in the model, were  $e\beta = e^{0.37} = 1.44$ . The 95% confidence limits for these odds are 1.12 - 1.87. For a two-unit change, the odds of remaining dependent at follow-up increased multiplicatively by  $e^{2(0.37)} = 2.09$ , etc.

The Hosmer and Lemeshow (1989) test for goodness of fit was used to check the adequacy of the model for the data. Large  $p$ -values indicated a good fit of the model. The value of the test statistic computed from our model was 1.48 with 8  $df$  ( $p = 0.99$ ), which indicates the appropriateness of the logistic regression model.

Although sex, race, and age were not significant, we re-ran the model without them to check whether their removal made a substantial change in the size of the ORs of the effects of main interest. Because the ORs remained almost exactly the same, the demographic variables were not considered confounders. However, they were retained in the model presented in Table 1 for general interest.

## DISCUSSION

To our knowledge, this is the first time that the effects of family history of alcoholism on the course of alcohol dependence has been studied prospectively, in any type of sample. The diagnoses were made systematically and reliably, according to DSM-IV criteria. The subjects were household residents, and thus the sample was not biased by treatment selection factors. The follow-up response rate was high, eliminating another potential source of bias. The effect of a parental history of alcoholism was shown to be significantly related to outcome.

Many studies use quantity/frequency of usual drinking as the drinking variable in analyses. We used the binge drinking variable because it seemed to have a better theoretical relationship to the outcome of alcohol dependence. In addition, about 30% of the original sample (962 subjects) responded positively to a question at baseline which asked if they found questions on usual drinking difficult to answer (Hasin and Carpenter, 1998). Note that although the binge drinking variable had a reasonably strong and quite significant effect, a measure of average daily ethanol consumption (Grant, 1996) was not significantly related to outcome (not shown).

The results of the logistic regression model indicated that

parental history and binge drinking each had an effect on short-term outcome of alcohol dependence. Because both were included in the model, the effects of each were adjusted for the effects of the other. There was no statistical or descriptive evidence of an interaction between the two factors (not shown). The results were not affected by sex, age, or race, which were included in the model as control variables.

Fillmore et al. (1991) have studied the chronicity of drinking problems in samples of the general population. They have found that older age and a greater number of problems predict chronicity. We did not find such an effect for age. In addition, when a term was added to the model that represented the number of dependence symptoms as a severity indicator, the term was not significant. Such differences in findings may have resulted from the fact that we studied strictly defined alcohol dependence rather than a more general measure of alcohol problems. Also, the length of follow-up was shorter in our study; an additional later follow-up assessment might show different results.

Some caveats must be made about the study. First, the subjects all lived in the same geographic area, a metropolitan area in the Northeast. Determining whether the results are the same in other areas would increase the ability to generalize the findings. Second, this was a short-term follow-up study. Determining the effects of family history on the longer-term course of alcohol dependence would also be of interest. Third, family history information was ascertained from the respondents rather than from direct interviews of family members. At times, family history methodology can lead to undercounts of disorders. However, this occurs more with disorders primarily characterized by subjective effects such as depression, because the effects are less likely to be known to informants. Various factors combine to make the family history method less problematic when studying alcoholism or other acting out disorders because many of the consequences are known to others. Also, the family history method provides information on relatives who are more likely to refuse to participate in direct interviews, such as relatives with alcohol problems (Andreassen et al., 1986).

Although parental history showed an effect on outcome, history of alcoholism among siblings did not. In a sample of adults, use of siblings in family histories can be problematic because they have not all passed through the age of risk for the disorder. In addition, size of sibships can vary from

subject to subject. If chronic cases had smaller sibships, and therefore less possibility of an alcoholic sibling, this might have produced the lack of sibling result but for a spurious cause. However, when we compared sibship size in remitted and nonremitted subjects, there was no significant or meaningful difference.

Failure to find any effect of family history on the chronicity of alcohol dependence would have suggested that a family effect on onset was transient, perhaps a particular combination of biological factors that occur at a particular age or particular point in time, possibly in response to environmental stimuli. The finding of a relationship between parental history of alcoholism and chronic course of alcohol dependence suggests that the nature of the familial condition is stable rather than transient. However, the present study needs to be replicated and extended. We hope that such studies can be conducted in the future.

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