

# Familial Alcoholism

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Certain forms of alcoholism have been shown to be familial and to be related to both genetic and environmental factors. Until a biological, genetic marker (or markers) can be identified, however, a careful family history will continue to be the only method of accurately diagnosing familial alcoholism. The family physician is in a unique position to make the diagnosis and to identify and selectively counsel family members at risk before alcohol consumption becomes a problem and, preferably, before drinking decisions are made.

Most physicians who care for families are keenly aware of the devastating effects of untreated alcoholism on the family system. There appears to be much less awareness, however, that alcoholism frequently emerges as part of a familial pattern and that the role of the family physician in cases of familial alcoholism should include prevention as well as intervention.

That alcoholism is a familial disorder is supported by extensive research data. All except one of nearly 150 family studies have shown rates of alcoholism to be higher among relatives of alcoholics than in the general population.<sup>1</sup> However, since children are obviously affected by both their genetic makeup and the home environment provided by their parents, debate has raged over the exact mode of transmission. Is heredity or family environment (or a combination of the two) primarily responsible for the familial trend of alcoholism? Recent research has begun to shed light on this question and appears to have important clinical implications for the family physician.

The purposes of this article are (1) to review briefly evidence for both genetic and environmental influences on the development of alcoholism within families, (2) to describe current knowledge

of two newly postulated diagnostic categories of familial alcoholism, (3) to offer guidelines for taking an accurate family history of alcoholism, and (4) to discuss the family physician's role in the diagnosis and prevention of familial alcoholism.

## The Nature vs Nurture Controversy

Aristotle warned over 2,000 years ago that drunken women "bring forth children like themselves."<sup>2</sup> While numerous observers throughout the centuries have also noted that alcoholism runs in families, many have believed that the condition is transmitted socially instead of genetically. Family studies since the early 1900s have shown that at least 25 percent of male relatives and between 5 and 10 percent of female relatives become alcoholic themselves.<sup>1</sup> These data, however, are incompatible with simple genetic mechanisms of inheritance. Further evidence against the influence of heredity was published in 1945 by Roe and Burks,<sup>3</sup> who found that a small group of children born to mildly symptomatic alcoholics but adopted soon after birth by nonalcoholics had very low rates of alcoholism, indicating that parental role modeling might be a more important factor than heredity in the etiology of the condition. In addition, epidemiological data were published in the 1960s implying that the prevalence of alcoholism was related to per capita alcohol consumption and to the price and availability of alcoholic drinks.<sup>4</sup> Both consumption and complications have been shown to vary widely from country to country,

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among social classes, among persons of differing occupations, and between men and women.<sup>5</sup>

Later in the 1960s, however, there was renewed research interest in heredity as a determinant of alcohol use and alcoholism. Three methods were used to separate genetic influences from environmental factors: studies of twins, studies of half-siblings, and studies of adoptees. All three lines of research provided evidence that alcoholism does, at least in part, have a genetic basis. Most twin studies revealed that monozygotic (identical) twins, who share 100 percent of their genes, show a greater concordance for alcoholism than do dizygotic (fraternal) twins.<sup>6,7</sup> Among the half-siblings of an identified alcoholic, the presence of an alcoholic biological parent was shown to be the only consistent predictor of alcoholism<sup>8</sup>; simply living with an alcoholic parent did not appear to increase the likelihood that alcoholism would develop in the offspring. In contrast to Roe and Burks' findings, an adoption study in Denmark by Goodwin et al<sup>9,10</sup> indicated that men having a severely affected alcoholic parent but adopted early in life are nearly four times more likely to become alcoholic themselves than the adopted sons of nonalcoholic parents. The presence of alcoholism in the biological parent was of greater predictive importance than the presence of alcoholism in the adoptive parents. A similar conclusion was reached later by Bohman,<sup>11</sup> who conducted a large-scale adoption study in Sweden.

### Highly Heritable Familial Alcoholism

Based on a careful review of the evidence for a hereditary factor in the etiology of alcoholism, Goodwin, in 1979,<sup>12</sup> speculated upon the existence of a form of alcoholism with a very high degree of inheritance. Citing evidence from family, twin, and adoption studies, Goodwin postulated four distinguishing clinical characteristics of this highly heritable form:

*Early onset of alcoholism.* While the general population appears to be at greatest risk of developing alcoholism between the ages of 30 and 60 years, the majority of the offspring of alcoholics in the Danish adoption studies were alcoholic by their late twenties. In many, the condition developed during adolescence. Consistent with this concept was the finding in one of the twin studies<sup>7</sup> that younger identical twins were concordant for alcoholism more often than were older twins.

*Severe symptoms.* The alcoholic parents in the adoption studies of Goodwin frequently experienced unusually severe medical, legal, and marital problems associated with alcohol abuse. Treatment for alcohol-related problems was often required. In addition, concordance rates for alcoholism among identical twins were observed to rise as a function of the severity of the alcoholism.<sup>6</sup>

*Absence of other psychopathology.* The adoption studies of both Goodwin et al<sup>9</sup> and Cadoret et al<sup>13</sup> failed to demonstrate an increased risk for relatives of alcoholics developing other forms of psychopathology. The vulnerability for alcoholism appeared to be specific, since the condition did not seem to be the product of a mentally disturbed family environment.

*Family history of alcoholism.* Goodwin postulated that the relatives of individuals with the highly heritable form of alcoholism (in particular the first-degree relatives) often have a history of the same form of unequivocal, "bender-type" alcoholism. In agreement with this concept are family studies showing that severe alcoholics have a family history of alcoholism more frequently than do less severe alcoholics.<sup>1</sup>

In 1981, a published reanalysis of the Swedish adoption data<sup>14</sup> strongly supported Goodwin's hypothesis. These data were derived from extensive examination of the medical and social records of all children born in Stockholm between 1930 and 1949 and subsequently adopted. A type of alcohol problem corresponding to Goodwin's concept was identified and was found to be highly hereditary regardless of environment. The natural fathers in these cases were found to have records of extensive treatment for alcohol-related problems and criminal behavior. The drinking problems developed early in life, and recurrent abuse often interfered with work and marriage. The sons of these men faced a ninefold increase in risk for developing alcoholism themselves despite adoptive environments. Fortunately, this form of alcoholism appeared to be uncommon and accounted for only about one in four of the adopted men with alcohol problems in the Swedish study.

### Milieu-Limited Familial Alcoholism

A much more common type of inherited alcohol problem was also identified in the reanalysis of the Swedish adoption data.<sup>14,15</sup> This form appeared to be associated with milder symptoms of alcohol

abuse in the biological father or mother. Medical problems related to excessive alcohol consumption did occur, typically later in life, but there was usually no history of treatment or of inability to maintain jobs or families.

Both male and female offspring were at risk of developing this form of alcoholism. The risk for male offspring varied from 13 to 26 percent and for female offspring from 7 to 8 percent, compared with 3 to 5 percent of men and 0.1 to 1 percent of women who suffer from alcoholism in the general population. Although susceptibility was clearly hereditary, the adoptive home environment also appeared to have a significant impact on both the frequency and severity of the problem. For this reason, this form has been termed "milieu-limited." Unfortunately, only a few environmental stress factors could be fully assessed in this study, which relied on official public statistics.

Although this research presents strong evidence that at least certain forms of alcoholism may be genetically transmitted, the exact mode of transmission remains to be determined. Several studies have indicated that alcoholism is not a sex-linked disease.<sup>16,17</sup> It also seems unlikely that a recessive gene is involved.<sup>17</sup> The phenotypic expression of alcoholism may be influenced by genes at each of several loci; however, efforts to date to identify a genetic marker associated with alcoholism have not resulted in reproducible findings. Color blindness, blood groups, genetically determined proteins, and finger-ridge counts have all been investigated as markers without success.<sup>18</sup>

A major methodological problem in these studies and in many of the other confusing or contradictory studies on alcoholism to date has been a neglect of the clinical heterogeneity of alcoholism. Those alcoholics who report a family history of alcoholism have been shown recently to differ significantly as a group from those who do not on many demographic and behavioral parameters.<sup>19</sup> However, only a few of the studies of possible genetic markers for alcoholism<sup>20,21</sup> have made any effort to isolate alcoholic subjects with a family history of the condition. Familial alcoholics have been postulated to be a more genetically "loaded" group,<sup>12</sup> and when they are mixed with nonfamilial alcoholics, significant differences from controls may be diluted or skewed in some other way. It is hoped that future research will focus on a more specific and homogeneous group of familial alco-

holics in the search for genetic markers for alcoholism. Until a genetic marker is identified, however, the family history will continue to be the only available method of separating familial from nonfamilial alcoholics.

### The Family History of Alcoholism

Taking a family history of alcoholism frequently amounts to asking a single family member a single question: "Has anyone in your family ever had a problem with alcohol?" Although such questions appear to be a time-efficient means of gross screening, they assume—often incorrectly—that the family member being interviewed (or filling out a questionnaire) shares with the physician a specific definition of problem drinking or alcoholism. Pathological family drinking behavior that the family member happens to consider "normal" or nonproblematic may be completely overlooked if this is the only question asked.

Within the time limitations of an office visit, it is preferable to use consistently three or four standardized questions that are highly specific and factual. Suggested questions, listed below, can be incorporated into the flow of the routine family history and are an effective means of screening briefly for familial alcoholism:

1. Have you ever thought that a member of your family should drink less or quit drinking?
2. Among members of your family, has drinking ever been a factor in divorce or separation?
3. Have friends or neighbors ever commented about the drinking of a member of your family?
4. Has drinking ever been a factor in a family member's loss of a job or problems with an employer?
5. Has any family member ever been arrested when he or she was drinking?

If this first screening is positive, a more detailed alcohol and drug history of the family should be taken. It is less overwhelming to the family member being interviewed if the physician initially asks at this point only about first-degree relatives (parents, siblings, and children). When this is completed, the focus can then shift to any distant relatives about whom the family member has reasonable knowledge. The physician's goal is to establish an operational diagnosis of alcoholic, suspected alcoholic, or nonalcoholic for each family member. These diagnoses can be modified as the physician gathers more information from other

family members individually or as a group and should be updated on a regular basis. Detailed criteria for the diagnosis of alcoholism have been well defined by others<sup>22</sup> and should be used to assess each family member suspected of being alcoholic. In addition, the family physician should look specifically at the age at which each affected family member began to drink, length of time between first drink and the development of problems, severity of problems and criminality, and the presence or absence of other psychopathology.

The physician should remember that relying on data from only one family member can often result in a highly inaccurate family history of alcohol abuse. The tendency of a patient to deny or distort the history of his own drinking is widely recognized, and interview techniques have been described to minimize these inaccuracies.<sup>23</sup> The tendency for individuals (especially those with alcohol problems themselves) to underreport alcoholism in their relatives appears to be even stronger. In fact, Rimmer and Chambers<sup>24</sup> found that 54 percent of alcoholic relatives would have been omitted from family histories if the data had been obtained from only one identified alcoholic family member. Combining and comparing data from interviews of numerous family members appear to be the best way of improving the accuracy of a family history of alcoholism.<sup>25</sup> Although falsely negative (because of denial or distortion) data are always a possibility, falsely positive information appears to be rare. Especially when a first-degree relative is reported to be alcoholic, this information is almost certain to be true. Moreover, detecting alcoholism in one family member should always indicate the possibility of at least one other alcoholic in the family. Lucero et al<sup>26</sup> found that if one member of a family is alcoholic, 82 percent of the time there will be one or more other alcoholic family members.

The reported rates of alcoholism in the general public have been shown to vary greatly depending upon the "framework of inquiry."<sup>27</sup> Information about alcohol problems obtained in the private office of a physician appears to be about twice as reliable as that obtained from a sample of hospitalized patients. Family physicians who provide ongoing office care for all available members of a family are therefore in a unique position to obtain accurate family profiles of alcoholism, provided they make the effort to inquire about family drink-

ing habits from each family member.

The family physician should nevertheless be alert to several other major sources of error in taking a family history of alcoholism:

*Occult alcoholism.* The physician should never assume that alcoholism is not a significant problem among women, adolescents, or elderly individuals. While the majority of currently recognized alcoholics are middle-aged men, the incidence of alcoholism among these other groups appears to be increasing in this country,<sup>28</sup> although it is frequently occult. Especially when inquiring about female relatives, the physician should actually press for more information, as the greater cultural pressure against public drunkenness in women often creates a situation in which a female relative's alcoholism either may be less apparent to family members and the physician or may even be carefully hidden by the family.

*Parents vs parental figures.* The disruptive effects of alcoholism on the family system often result in divorce or broken homes with children being given up for adoption. In taking a history, it is important to note carefully whether information about an individual's "parent" relates to a biological parent, stepparent, adoptive parent, or surrogate parent. While genetic material is obviously provided only by biological parents, the home environment provided by any parental figure (whether or not a blood relative) has been shown to affect the development of at least some forms of familial alcoholism.<sup>14,15</sup> Consequently, it is of use to collect data about the drinking habits of all significant parental figures, surrogate as well as biological.

*Secondary depression.* As has been noted, familial alcoholism is not in general associated with a family history of mental illness. The physician, however, is wise to investigate further any family history of depression. It is well known that depression may be a consequence of unreported alcoholism, and when seen as a "secondary" disorder, depression is most frequently secondary to alcoholism.<sup>29</sup>

*"Reactive" teetotalism.* The total absence in a family system of any models of moderate drinking also requires further investigation. Teetotalism, like alcoholism, runs in families.<sup>26</sup> This behavior, of course, may simply reflect cultural or religious beliefs in some family systems. In other families, however, "reactive" teetotalism may occur

among the members of one generation in response to witnessing the devastating effects of alcohol on a previous generation. Eliciting this history is particularly important to avoid missing a familial tendency toward alcoholism that because of genetic encoding could reappear after skipping one or more generations.

### Clinical Implications

Alcohol-related problems have been cited to be among the most preventable of all health problems in this country.<sup>30</sup> To date, strategies to prevent alcohol-related problems and alcoholism have targeted those sections of the population considered to be at high risk. For example, public information campaigns and school alcohol education programs have aimed at changing the drinking behavior of teenagers and young men. Risk factors such as social class and ethnic affiliation have been considered in the design of other preventive projects.<sup>30</sup> Of the known risk factors for alcoholism, however, a family history of alcoholism is by far the strongest.<sup>22</sup> Recent research reviewed in this article has begun to define the familial risk factor, and it now appears that cases of familial alcoholism can be predicted and, conceivably, prevented.

Not all cases of alcoholism emerge as part of a familial pattern. Statistics indicate that about 50 percent of all identified cases of alcoholism are "sporadic"; that is, they do not appear to come from families in which one or both parents were alcoholic.<sup>1</sup> On the other hand, this percentage signifies that as many as one half of all cases of alcoholism encountered in an average family physician's practice *do* follow a familial pattern. Given the family physician's ability to observe families and their patterns of illness over time and his skills as both genetic counselor and health risk manager, the family physician appears ideally suited to carry out an effort to prevent familial alcoholism. Whereas most physician-initiated efforts to prevent alcoholism to date have amounted to secondary prevention, since they have focused on the early diagnosis and early treatment of symptomatic alcoholics, the proposed scheme of primary prevention allows family physicians to address alcoholism before the appearance of symptoms and preferably before drinking decisions are made.

To carry out this preventive strategy, the family physician first must incorporate into his or her

routine history-taking a standard family history of alcoholism that screens every family in the practice for evidence of alcoholism. As has been noted, this requires of the physician both good interviewing skills and access to multiple family members. If active cases of alcoholism are uncovered in this process, the physician's immediate responsibility continues to be the evaluation and referral to treatment of affected individuals. The physician's efforts and indeed responsibilities then extend to the currently unaffected individuals in families with a history of alcoholism. Those individuals in the "at-risk" category include specifically (1) the first-degree relatives of any family member diagnosed as alcoholic, and (2) all kindred in any family in which there is a clear history of two first-degree relatives both affected by alcoholism.

The subcategories of familial alcoholism described in this paper must be considered speculative until they are confirmed and analyzed in greater detail by prospective research. The work to date strongly indicates, however, that familial alcoholism is a heterogeneous condition and that one form of the illness is quite severe and highly heritable while another is milder and more susceptible to environmental factors. Before the family physician can determine the relative risk of each patient and tailor his counseling selectively, it appears that he must consider the following variables about the identified alcoholic(s) in each family: severity of symptoms, age at onset of problem drinking and interval between the first drink and problem drinking, and the presence or absence of other psychopathology. The family physician has the advantage of seeing patients repeatedly, and therefore has the ability to analyze each of these variables carefully and then to choose the best time to counsel family members at risk.

More commonly, the family physician will encounter individuals from families with a history of a more insidious onset of milder symptoms of alcoholism. These individuals should be advised of an increased personal risk of alcoholism and of the need to approach drinking with greater caution. Should they choose to begin or to continue drinking, these individuals should be monitored closely for early signs of alcoholism. Current research indicates that this form of familial alcoholism probably has a multifactorial etiology involving environmental as well as genetic determinants.

Unfortunately, the research to date has not been able to characterize in any detail the specific environmental determinants of this "milieu-limited" form of familial alcoholism. Unaffected individuals in these families should nonetheless be educated about nonchemical methods of coping with stress and anxiety-producing situations that arise in their environment. Moreover, it appears that the family environment in which these individuals are born and reared either may forestall or may precipitate or exacerbate the clinical manifestations of this form of alcoholism. Conceivably, intervention by the family physician and referral of appropriate families for therapy or of the spouse and children to Alanon or Alateen could reduce dysfunction in these families and thereby lower the risk for future generations. Obviously, further research is needed on this important question.

Those individuals from families with a history of the early-onset, severely symptomatic form of alcoholism must be considered to be at even higher risk. Although data from the Swedish adoption study<sup>14,15</sup> place at risk only the male offspring of these alcoholics, it is important to remember that this was a retrospective study based on official public records that may well have been biased toward the underreporting of alcohol-related problems of women. Male offspring in these families can be counseled that should they choose to drink, their risk of developing symptoms of severe alcoholism is as much as nine times greater than other men in the general population. Until a biological genetic marker is identified, however, both the male and the female members of families with a history of this fulminating form of alcoholism should seriously question, with the help of their family physician, whether it is worth the risk to drink at all.

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