6 Genetic Factors in Alcoholism

The contribution of genetic factors to vulnerability to alcoholism has been vigorously debated in the past 30 years. During this period research has shifted from looking for evidence of whether alcoholism could be a genetically influenced disorder to the delineation of the complexities of biological vulnerability. It has been well accepted that alcoholism and alcohol-related diseases have a pronounced familial tendency. Based on a large number of recent multilevel studies (epidemiological, clinical, neurophysiological, neuropsychological, biochemical, organ damage, genetic markers, family, adoption and twin studies, high-risk groups, and environmental factors), it is now well agreed that a strong genetic component plays an important role in the development of alcoholism (for a recent review on genetics and alcoholism, see Goedde and Agarwal 1987b; Agarwal and Goedde 1987c). However, to identify discrete underlying genetic factors in the development of alcoholism one is confronted with a number of questions such as: is alcoholism an inherited disorder; are there genetically distinct forms of alcoholism; is alcoholism a multifactorial disorder with a monogenic or a polygenic aetiology; what are the predisposing factors; are the genetic contributions from the environmental influences separable; what is the mode of transmission of the biological risk factors; is it possible to modulate genetic influences through prevention strategies (e.g., education, making alcohol nonavailable via price and production policies)? To answer some of these questions, it may be worthwhile reviewing some of the already known liability factors in alcoholism.

6.1 Ethnic and Cultural Variables

Ethnic differences in the metabolism of alcohol have been known for years. A higher rate of alcohol metabolism in Chinese, Japanese, and Native Americans than in Caucasians has been reported. American and Mexican Indians metabolize alcohol faster than Caucasians (cf. Chap. 2). Ethnic and cultural factors are some of the strongest determinants of drinking patterns in a society. It has long been suspected that the influence of national and ethnic origin may account for a major part of the variance observed in comparative studies of alcoholism rates within different populations. Possible biological and genetic factors responsible for differences in drinking patterns in Orientals and other racial-ethnic groups have been discussed above (cf. Sect. 3.4).
In general, Japanese, Chinese, and Koreans have been found to drink smaller amounts of alcohol and have a relatively low rate of alcohol-related problems. On the other hand, North and South American Indians have been known for centuries to abuse alcohol despite their inherent intolerance and sensitivity to alcohol. Similarly, a marked difference in the extent of alcoholism and related problems among Israeli Jews of the three major ethnic communities, Ashkenazi, Sephardi, and Oriental, has been reported (Snyder et al. 1982). In this survey, a significantly higher percentage of Sephardi-Oriental subgroups were found to be alcoholics than the Ashkenazi subgroup. The differences have been explained to be due to sociological factors in terms of a historic dialectic of differentiation of Jewish minorities from the drinking norms of surrounding majorities. Additional factors like religion and social stress may have also played an important role in conditions which foster or thwart alcoholism (Snyder et al. 1982). It was also noted that comparative freedom from alcoholism may be particularly characteristic of the more religious Orthodox Ashkenazim despite their frequent drinking.

6.2 Familial and Nonfamilial Alcoholism

Because of a high degree of familial association, for many years alcoholism was regarded as a distinct disease which may be transmitted from generation to generation (Goodwin 1981). A familial association could result from cultural factors tending to encourage heavy drinking in family members. The family system may generate or promote the development of alcoholism in a family member. Children try to model their behavior on that of their parents and in doing so may also imitate their drinking habits. On the other hand, drinking may be discouraged in some families for religious, cultural, or climatic grounds, while in other families constraints on heavy drinking may be virtually nonexistent. Interfamily and interclass differences in alcohol use may also account for part of the variation in alcoholism rates among families. Therefore, "familial" does not necessarily mean "hereditary" (Goodwin 1980).

A number of recent studies have shown that while the familial alcoholism has a specific biological and genetic basis, nonfamilial alcoholism is determined by sporadic sociocultural influences. Familial alcoholism is distinguishable from the nonfamilial form as having a younger age of onset, more severe problems, and a more rapid progression to dependence (Goodwin 1985). In other studies (Penick et al. 1978; Frances et al. 1984), alcoholics with a family history of alcoholism were found to begin drinking earlier in life and had more problems than those without a family history.

6.3 Genetic Contributions

To identify hereditary and environmental factors in alcoholism several strategies have been applied. Some of the most common approaches are: (1) family studies (incidence of alcoholism in the relatives of alcoholics, family system variables,