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Overview

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In the past three decades a substantial number of family, twin, and adoption studies have demonstrated the role of genetics in alcohol abuse and alcoholism. Indeed, the role of genetics in the development of alcoholism has been well demonstrated.

It is widely accepted that while genetic factors do increase the predisposition toward the development of alcoholism, it is a complex gene-environment interaction that leads to the manifestations of the disease. The presence of genetic factors that lead to a predisposition toward alcoholism is of major scientific as well as clinical interest. Indeed, if it were possible to identify genetically determined predisposing variables, new light would be shed on etiological factors, and prevention strategies could be developed and implemented before the onset of the disease.

Several scientific avenues are currently available to search for potential biological and/or behavioral factors that predispose an individual toward alcoholism. Indeed, if such predisposing factors were genetically transmitted, they should be observable in a substantial proportion of abstinent alcoholics. Although such may be the case, predisposing factors may not be studied in the most optimal fashion in alcoholic patients. Chronic alcoholics have been exposed to the long-term deleterious effects of alcohol, resulting in biological and behavioral consequences that may obscure or confound the study of predisposing factors. The presence of biological and/or behavioral anomalies in abstinent alcoholics may not reflect predisposing factors, but may be the natural consequence of alcoholism or represent an interaction between predisposing factors and alcoholism. For this reason, predisposing factors cannot be readily examined in chronic alcoholics.

For the past several years a number of investigators have attempted to examine predisposing factors in offspring of alcoholics. Specifically, most investigators have conducted biological and behavioral investigations with male offspring of alcoholic fathers. This approach maximizes the possibility of identifying some predisposing factors since sons of alcoholics are four to five times more likely to develop severe and persistent alcohol problems compared to sons of nonalcoholics. It is now well accepted that sons of alcoholics are indeed at high risk (HR) compared to sons of nonalcoholics who are at low risk (LR) for developing subsequent alcoholism. The comparison of HR individuals with LR individuals appears to be a scientifically fruitful avenue of investigation. It has already provided a number of promising findings, which are illustrated in the following papers.

While the identification of biological or behavioral differences between individuals at HR and LR for alcoholism cannot be invariably taken to reflect genetic factors, it represents the beginning of an important scientific enterprise. Differences between individuals at HR and LR for alcoholism may provide valuable information about biological, behavioral, and environmental factors. Whether or not such differences are the result of genetic influence in no way minimizes the fundamental importance of such findings. Genetically determined factors have substantial implications for the identification of phenotypic markers utilized in linkage analysis. Moreover, they may be used as possible predictors in the subsequent development of alcoholism and as early identifying markers before the onset of alcoholism.

Nongenetically determined factors are also valuable to understand the etiology of alcoholism concerning behavioral and/or environmental influences. Indeed, genetically and nongenetically determined factors are both important in furthering our understanding of alcoholism, and most of all in developing rational prevention and treatment approaches. The use of the HR paradigm presents unprecedented opportunities to better understand the potential causes of alcoholism.