

Neuroimaging Confirms The Greater Vulnerability Of Women's Brains To Alcohol

- *Women appear to be more vulnerable to chronic drinking than men.*
- *New research uses computed tomography to examine alcohol's effects on the brains of alcoholic men and women.*
- *Results show that women develop alcohol-related brain damage more readily than men.*

Women appear to be more vulnerable to chronic drinking than men are. Yet few studies have looked at gender differences in alcohol's effects on the brain.

A study in the May issue of *Alcoholism: Clinical & Experimental Research* addresses this gap in research, using computed tomography (CT) to examine brain atrophy in the brains of alcoholic men and women. The findings support and build upon a prior hypothesis that women develop alcohol-related brain damage more readily than men.

“Studies using brain-imaging techniques are time-consuming and expensive,” said Karl Mann, full professor in the department for addictive behavior and addiction medicine at the University of Heidelberg and first author of the study. “Women have generally not been considered in brain-imaging studies, or samples have not been large enough to differentiate between women and men. Conversely, male patients with alcohol dependence have historically been easier to recruit because the majority of alcoholic patients are male and the first evaluations of larger samples were carried out in soldiers.

Furthermore, study results were thought to be generally applicable to both genders. Yet gender differences in the development, course and consequences of alcohol dependence *have* to be considered in early diagnosis as this probably will lead to different therapeutic strategies.”

“Not only is the prevalence of alcoholism somewhat higher in men than women, thus increasing the chances of recruiting men over women in research programs,” added Edith Sullivan, a professor in the department of psychiatry and behavioral sciences at Stanford University School of Medicine, “but some speculate that women, with household and motherly responsibilities, have greater difficulty in finding time to participate in studies.”

“Telescoping” is a term that refers to the later onset and possibly accelerated negative effects that chronic alcohol consumption may have on the brain's structural and functional systems in women. “Epidemiological studies have demonstrated gender differences in alcohol-consumption behavior and the course of alcohol dependence,” said Mann. “Women typically start to drink later in life, consume less per occasion and are, in general, less likely to develop alcohol dependence. One could reason that women are less affected by alcohol. But there is, in fact, evidence for a *faster* progression of the developmental events leading to dependence among female alcoholics and an earlier onset of adverse

consequences of alcoholism. This suggests that women may be *more* vulnerable to chronic alcohol consumption.”

For this study, researchers examined 158 subjects: 76 women (42 patients, 34 healthy “controls”), and 82 age-matched men (34 patients, 48 healthy “controls”). All of the alcoholics were recruited from a six-week inpatient treatment program, and met Diagnostic and Statistical Manual of Mental Disorders - Fourth Edition and International Classification of Diseases 10 criteria for alcohol dependence. Control subjects were recruited by advertisement. CT scans were performed twice among the patients – at the beginning and end of their six-week program – and once among the controls. Results confirm gender-specific differences in the onset of alcohol dependence.

“We were able to confirm the telescoping course of alcohol dependence in women,” said Mann, “meaning faster progression of the developmental events leading to dependence among female alcoholics and an earlier onset of adverse consequences.” Results also show that brain atrophy seems to develop faster in women.

“We confirmed greater brain atrophy in alcoholic women and men compared to healthy controls,” said Mann. “Furthermore, the women developed equal brain-volume reductions as the men after a significantly shorter period of alcohol dependence than the men. These results corroborate previous studies that have found other gender-related consequences of alcohol, such as cognitive deficits, alcoholic cardiomyopathy, myopathy of skeletal muscle, and alcoholic liver disease - all of which occur earlier in women than in men despite a significantly shorter exposure to alcohol.”

“The higher depression index in alcoholic women than men was also of interest,” added Sullivan, “and may actually serve as a useful trigger to family members that ‘something is wrong’ with the affected individual.

The good news is that abstinence seems to partially reverse the brain atrophy, for both genders. “Because of the ‘telescoping’ effect,” said Mann, “early diagnosis and early prevention are even more important for women with alcohol problems than for men. Despite the fact that men, in general, drink more alcohol and are more likely to develop alcohol dependence, it is those women who consume alcohol who probably develop alcohol dependence and adverse consequences more readily than men.”

SOURCE

Ackermann, K; Croissant, B; Diehl, A; Mann, K; Mundle, G; Nakovics, H. (May 2005). Neuroimaging of gender differences in alcohol dependence: are women more vulnerable? *Alcoholism: Clinical & Experimental Research*. 29(5):896-901.