

Bad mix: Heavy beer drinking and a gene variant increases gastric cancer risk

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Heavy beer drinkers who have a specific genetic variant in the cluster of three genes that metabolize alcohol are at significantly higher risk of developing non-cardia gastric cancer, according to research presented at the AACR 102nd Annual Meeting 2011, held here April 2-6.

Study results also showed that the same risk is also elevated (but not as significantly) for heavy beer drinkers who do not have the variant, known as rs1230025, and for non-drinkers who have rs1230025 or rs283411.

"This is a classic gene-environment interaction," said Eric Duell, Ph.D., senior epidemiologist in the [Cancer Epidemiology](#) Research Program at the Catalan Institute of [Oncology](#) in Barcelona, Spain. "Having both of these risks - heavy beer consumption and rs1230025 - appears to be worse in terms of [gastric cancer](#) risk than having just one or neither."

Gastric cancer is the second leading cause of cancer death worldwide, but because some countries, such as the United States, have much lower rates of gastric cancer than others, Duell believes this disease has a stronger environmental component than a genetic component.

[Alcohol](#) use has long been suspected to be a contributing factor to the development of gastric cancer but numerous studies have shown mixed results.

Duell and colleagues conducted a comprehensive analysis of alcohol consumption and gastric cancer risk in the more than 521,000 people aged 35 to 70 years old who participated in the European Prospective Investigation into Cancer and Nutrition (EPIC) study from 1992 through 1998.

The researchers evaluated the type of alcohol consumed (i.e. wine, beer or liquor) and the location and grade of cancer. Total consumption of

60 grams of pure ethanol/alcohol from all beverage types combined carried a 65 percent increased risk. (One 12 ounce beer contains about 13 grams of pure alcohol/ethanol.)

However, this association was confined to beer. Results showed that drinking 30 grams of pure ethanol/alcohol or more a day from beer was linked to a 75 percent increased risk of developing gastric cancer. Wine and liquor was not associated with gastric cancer risk, Duell said.

In a further analysis, using the EurGast study nested within EPIC (which included 365 gastric cancer cases and 1,284 controls), the researchers analyzed the effects of known single nucleotide polymorphisms (SNPs) in the gene cluster (ADH1) that produces an enzyme that breaks down alcohol. Two variants in the ADH1 locus were statistically significantly associated with gastric cancer risk; only one variant, rs1230025, interacted with beer consumption to increase risk.

The exact mechanism for how alcohol may cause gastric cancer is not known. However, Duell said there are compelling hypotheses involving the metabolite of alcohol (acetaldehyde, a toxic and carcinogenic compound), and nitrosamines such as N-nitrosodemethylamine (a known animal carcinogen that has been found in beer).

Provided by American Association for Cancer Research

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