Does Gene Variant Make Women More Prone to Alcoholism?

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A particular gene variant might make women more susceptible to alcoholism. At least, a study carried out by the Universities of Bonn and Sweden's Karolinska Institute makes this a plausible conclusion.

According to this, a gene in the endorphin metabolism is altered in a typical fashion more often in women alcoholics than in healthy women. In mice too, endorphins seem to play an important role in the amount of alcohol consumed, particularly among females. The scientists discuss their results in the current issue of the journal 'Biological Psychiatry' (doi:10.1016/j.biospych.2008.05.008).

Endorphins are known as 'happiness' hormones. They activate what is known as the reward system in the brain and thereby ensure a good mood. This could be the case after jogging (experts talk about 'Runner's High'), after a bar of chocolate or also after a glass of beer or wine. The body endeavours to repeat this high, in the worst case ending in addiction.

Without these 'happiness' hormones you should be going easy on the alcohol, the theory also says. Researchers have tested this hypothesis. For this they examined mice that could not produce any endorphins due to a genetic mutation. The laboratory mice had the choice of quenching their thirst with pure water or an ethanol solution. 'Overall, mice without endorphins drank less alcohol than their relatives with endorphins,' Dr. Ildikó Rácz from the Bonn Institute of Molecular Psychiatry explains. She led the study together with her colleague Britta Schürmann and the

director of the institute, Professor Dr. Andreas Zimmer.

The endorphin effect was particularly marked in female mice. Normally these tend to hit the bottle more than males. 'But without endorphins, the decrease in their desire for alcohol was particularly drastic.' Dr Rácz adds. By contrast, in males the absence of the endorphins made less difference.

From mice to humans

Then the scientists scrutinised genes which are important in the human endorphin metabolism. For this they analysed blood samples of just short of a total of 500 female and male alcoholics for peculiarities. Successfully. 'We were able to show that two genetic changes in the genes of female alcoholics occurred significantly more frequently than in healthy women,' is how Dr Rácz sums up the results. 'We don't know what the exact effect of these changes is.' By contrast, the scientists did not find any changes that indicated a contribution of endorphins in male alcoholics. Women with a particular genetic make-up could therefore be at greater risk of becoming dependent on alcohol. 'Today we estimate the influence of the genes in this disease to be at least 50 per cent,' Ildikó Rácz explains. However, she warns against exaggerating the results. 'We can only evaluate how large the influence of the genetic mutations we found really is after carrying out further research.'

At least it seems to be a bit clearer now that endorphins really do play a role in the development of ethanol addiction. Animal experiments provided more contradictory answers to this question, probably also because alcohol consumption is in fact likewise dependent on environmental influences and therefore on the conditions the experiments were carried out under. As Ildikó Rácz says: 'However, our research clearly assigns a fundamental role to endorphins.'

Source: University of Bonn