

# Alcohol impairs the body's ability to fight off viral infection

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Alcohol is known to worsen the effects of disease, resulting in longer recovery period after trauma, injury or burns. It is also known to impair the anti-viral immune response, especially in the liver, including response against Hepatitis C (HCV) and HIV. New research published in BioMed Central's open access journal BMC Immunology shows that alcohol modulates the anti-viral and inflammatory functions of monocytes and that prolonged alcohol consumption has a double negative effect of reducing the anti-viral effect of Type 1 interferon (IFN) whilst increasing inflammation via the pro-inflammatory cytokine  $\text{TNF}\alpha$ .

Researchers from the University of Massachusetts Medical School looked at the effect of alcohol on [monocytes](#) collected from the blood of healthy volunteers. The group, led by Prof Gyongyi Szabo, focussed specifically on two disease related pathways – the first (Toll-like receptor 8 – TLR8) stimulated by single strand RNA viral attack and the second (TLR4) is involved in recognising bacteria.

Their results showed that, as expected, activation of these pathways resulted in an increase in the levels of the anti-viral cytokine IFN, however this was reduced by treatment with alcohol equivalent to four or five drinks a day for seven days. Similarly stimulation of these pathways resulted in an increase in the levels of the pro-inflammatory cytokine  $\text{TNF}\alpha$ . However, while a single treatment with alcohol decreased the amount of  $\text{TNF}\alpha$ , prolonged treatment increased levels of inflammation.

Prof Szabo said, "Alcohol has a profound effect of inhibiting IFN production in monocytes regardless of whether the danger signal is intracellular (TLR8) or surface-derived (TLR4). Such a reduction would impair the body's ability to fight off infection. Additionally, the fact that Type I IFN production is depressed despite increased levels of the pro-inflammatory cytokine, TNF $\alpha$ , due to chronic alcohol exposure suggests that prolonged alcohol must change the immune balance of monocyte activation and impair host response to single-stranded virus infection like [hepatitis C](#)."

**More information:** Inhibition of TLR8- and TLR4-induced Type I IFN induction by alcohol is different from its effects on inflammatory cytokine production in monocytes, Maoyin Pang, Shashi Bala, Karen Kodys, Donna Catalano and Gyongyi Szabo, *BMC Immunology* (in press)

Provided by BioMed Central

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