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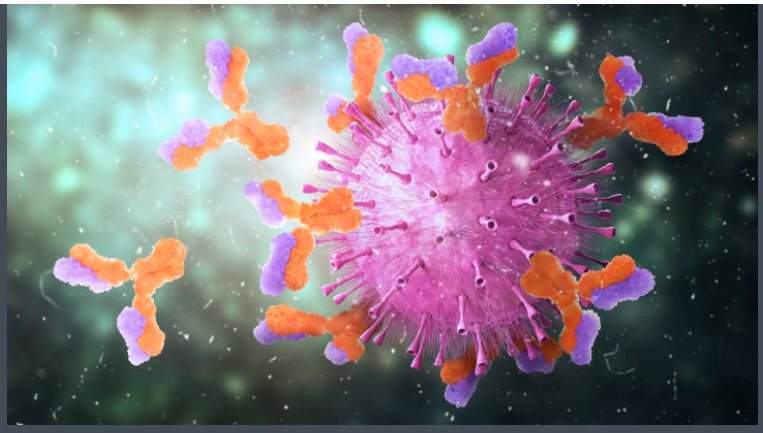
Viral antibody response in the prediction of complications associated with alcoholic hepatitis



Alcohol abuse-related liver diseases influence antibody responses against pathogens (bacteria and viruses). The aim of this new article is to study the antibody repertoire against pathogens in alcohol abuse disorders and more specifically in its most severe form, alcoholic hepatitis. Using a machine learning approach, a viral antibody signature is established, and it has been created a mortality prediction model in patients with alcoholic hepatitis that is more accurate than the currently used models.

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Alcoholic hepatitis or alcohol-associated hepatitis is an acute form of liver disease related to alcohol use that occurs acutely in patients with high alcohol intake (>100 g/day). Our article explores the relationship between antibody responses against pathogens (bacteria and viruses) and morbidity in patients with alcoholic hepatitis.

In this experimental work carried out at the University of San Diego (California), several cohorts were studied; 36 healthy controls, 48 subjects with alcohol abuse disorder (AUD),

and 224 patients with alcoholic hepatitis, mostly from an international consortium for the study of alcoholic hepatitis (INTEAM) of which Vall d'Hebron Hospital is a member.

In these groups, the repertoire of antipathogen serum antibodies (bacteria and viruses) was analyzed with a new high-performance technology (VirsScan) that allows the identification of antibody profiles against various viral or bacterial epitopes (a portion of a molecule to which antibodies bind). The serum antibody repertoire against viruses and bacteria was found to be similar between healthy subjects and patients with alcohol abuse. In patients with alcohol abuse (without alcoholic hepatitis) who achieved abstinence during follow-up, the serum antibody repertoire against bacteria and viruses increased (Figure 1). The increase was less marked the greater the severity of the liver injury. In patients with alcoholic hepatitis, a lower serum antibody repertoire (total number of antibodies against pathogenic species, bacteria, or viruses) was found. Patients with alcoholic hepatitis who achieved abstinence from alcohol during follow-up did not show any change in the serum antibody repertoire against viruses or bacteria (Figure 1).

The most interesting finding of the work is that disease decompensations (ascites, esophageal varices, and mortality) were correlated with a decrease in the viral antibody repertoire without changes in the antibacterial antibody repertoire (Figure 1). This decrease was not statistically related to the presence of infection, steroid treatment, antibiotic use, or death from sepsis.

From these findings and through artificial intelligence (machine learning approach), a viral antibody signature was developed that could predict mortality in patients with alcoholic hepatitis more accurately than the currently used predictive models.

In summary, the key finding is that, in alcoholic hepatitis, patients with a weak antibody response to viruses have a higher risk of decompensation (ascites, esophageal varices) and death compared to those with a higher antibody response. This suggests that the viral immune system plays a critical role in the progression of alcoholic hepatitis. If these findings are confirmed and the technique simplified, measuring viral antibody response could help identify patients at higher risk of decompensation and death, allowing for a more personalized approach to treatment.

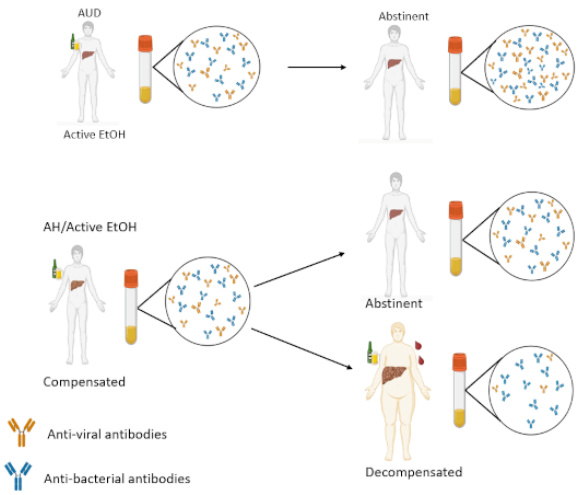

Figure 1. Anti-viral and anti-bacterial antibody responses in alcohol use disorder (AUD) (without HA) and in alcoholic hepatitis. EtOH: alcohol intake.

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