

High prevalence of non-virus/non-alcohol-related alanine-aminotransferase increase in blood donors

A slight increase of alanine-aminotransferase (ALT) levels is frequently observed (23.7%) in blood donors negative for hepatitis viruses (B and C) and alcohol abuse. The highest rate of subjects with ALT abnormalities was observed in men 20-40 years old, with a body mass index ≥ 25 . Non-alcoholic fatty liver disease (NAFLD) is probably the most frequent cause of hypertransaminasemia in Italian blood donors.

Hepatitis viruses (HAV, HBV, HCV, HDV) and alcohol intake have played a major role in causing acute and chronic liver damage in Italy during the last decades.¹ However, these factors do not account for all cases of hypertransaminasemia observed in clinical practice. Screening of the general population in northern Italy during the years 1991 to 1993² revealed that a high proportion of subjects showed elevated transaminase levels despite being negative for hepatitis virus markers and denying excessive alcohol intake.

We evaluated the alanine-aminotransferase (ALT) levels in 9,495 blood donors negative for both hepatitis B surface antigen and antibody to hepatitis C virus. The population consisted of 7,527 men and 1,968 women (median age 35.4 years; range 16-65) who had all undertaken screening procedures for blood donation at a blood bank in southern Italy. Diabetes, history of drug addiction, alcohol abuse, recent use of potentially hepatotoxic drugs or parenteral exposure were excluded using a specific questionnaire. Alanine-aminotransferases were measured by an ultraviolet kinetic test (Boehringer-Mannheim, Italy) using the optimized method recommended by the International Federation of Clinical Chemistry. The upper limit of normal was 40 U/L as indicated by the manufacturer.

Overall, 23.7% of subjects (2252/9495) presented abnormal ALT levels. The ALT levels were above the normal limit in 423/3,451 (12.2%) of subjects with a body mass index (BMI) < 25 and in 1,829/6,044 (30.2%) of subjects with BMI ≥ 25 ($p < 0.05$). The highest rate of subjects with altered ALTs was observed in men 20-40 years old (Table 1). ALT abnormalities are generally slight, usually twice as high as the maximum normal value (MNV) (Table 2). These findings suggest that: 1) non-virus/non-alcohol-related hypertransaminasemia is a major epidemiological problem; 2) overweight is a frequent factor associated with ALT abnormalities. As these findings agree with corresponding figures from studies conducted in northern Italy,² this phenomenon is widespread throughout our country.

Non-alcoholic-fatty liver disease (NAFLD) - steatosis and steatohepatitis frequently present in overweight or obese patients, is probably the most common cause of abnormal transaminase levels in blood donors³ although the role played by other, rarely explored, factors of liver injury - i.e. celiac disease, occult infection, etc.⁴⁻⁸ has to be assessed.

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Table 1. Prevalence of ALT abnormality by age and sex among blood donors negative for hepatitis virus markers and denying alcohol intake, in southern Italy, 1994 - 1998.

Age groups (years)	Men		Women	
	N	%	N	%
0 - 20	38/246	15.44	5/89	5.61
20 - 40	1447/4786	30.23	45/1185	3.79
40 - 60	653/2437	26.79	56/679	8.24
> 60	5/58	8.62	3/15	20.00
Total	2143/7527	28.47	109/1968	5.53

Table 2. Prevalence of different levels of ALT abnormality by age and sex among our population of blood donors in southern Italy, 1994 - 1998.

Age Groups (years)	Men		Women	
	< 2 x MNV%	> 2 x MNV %	< 2 x MNV	> 2 x MNV%
0 - 20	12.60	2.84	5.61	0
20 - 40	26.57	3.65	3.45	0.33
40 - 6	25.19	1.60	7.80	0.44
> 60	8.62	0	20.00	0
Total	25.53	2.93	5.18	0.35

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