



Are current normal ranges set too high? Prevalence of abnormal liver transaminases in a large population-based cohort of the Ruhr Area - The Heinz Nixdorf Recall Study -

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Background:

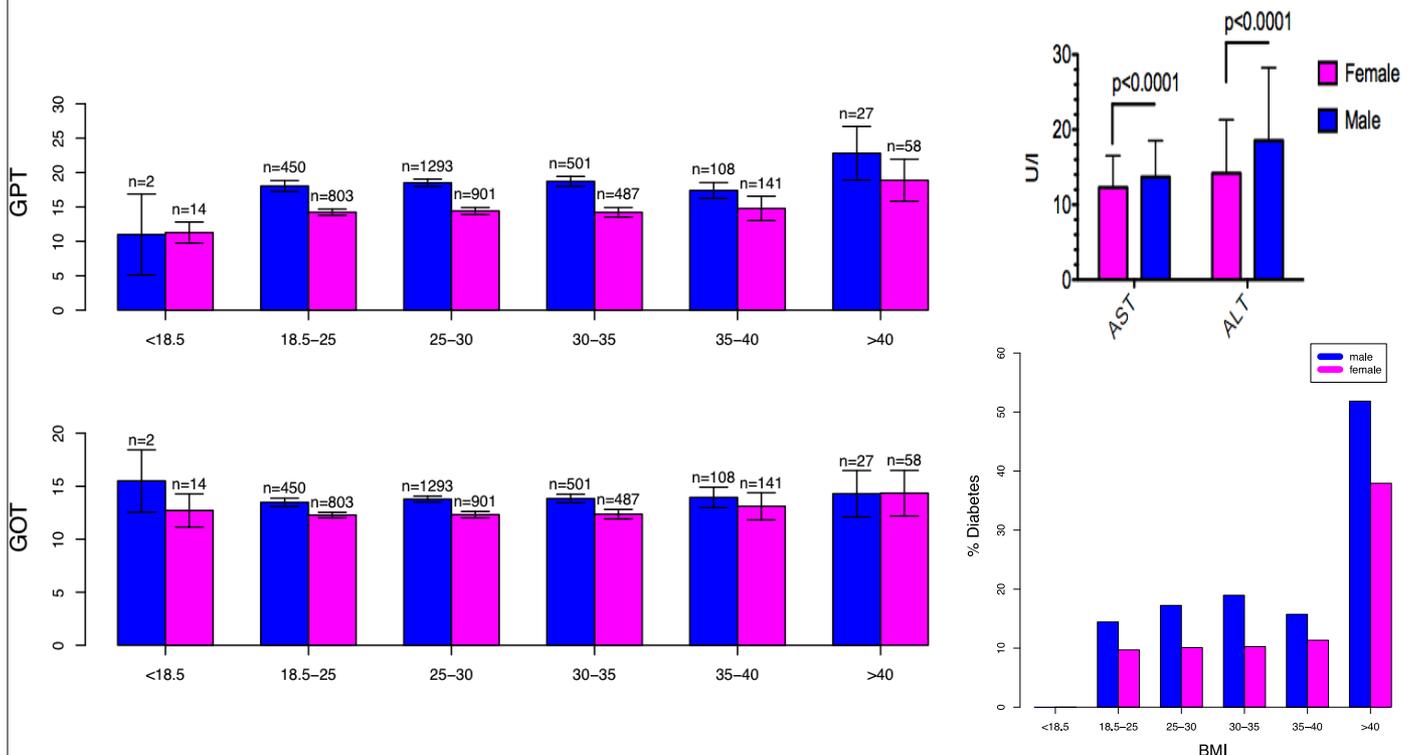
- Chronic liver disease is a major cause of morbidity and mortality in the industrial nations.
- Abnormalities in serum content of liver transaminases (LT) often reflect significant liver disease. However, normal values can persist with severe liver damage.
- The prevalence of liver related diseases in Germany is estimated at roughly 5 Mio. people (6.25%). Though, the prevalence of elevated aminotransferases in asymptomatic subjects in Germany is unknown.

Methods:

- Data analysis of participants (n=4814, aged 45-75 years) from the Heinz Nixdorf Recall study, a population-based cohort study.
- Normal ranges: LT (alanine aminotransferase [ALT], aspartate aminotransferase [AST]) were considered abnormal if they were >50 U/l for male, >35 U/l for female.

Results:

- Mean ALT: 16 ± 8.8 U/l; Mean AST: 13 ± 4.6 U/l; both well below the normal threshold for normal values.
- Stratified by gender, ALT was significantly higher in male subjects than in females (19 ± 9.7 U/l vs. 14 ± 7.1 U/l; $p < 0.0001$), which was also observable for AST (14 ± 4.8 U/l vs. 12 ± 4.2 U/l; $p < 0.0001$), respectively.
- However, the percentage of female subjects with elevated AST was significantly higher compared to male subjects [15/2406 (0.6%) vs. 5/2383 (0.2%); $p = 0.0045$]. A similar proportion was found for ALT, with 1.8% (43/2407) females above normal range compared to 1.5% (36/2384) males ($p = 0.0075$).
- Mean Body-Mass-Index (BMI) : 27.9 kg/m²; typ-2-diabetes: n=656 (13.7%).
- A large discrepancy was observed between estimated numbers of liver disease (6.25% of the population) and the number of subjects with elevated LT (below 2%) in the analyzed study cohort. Facing the overweight BMI and the prevalence of typ-2-diabetes, the small number of abnormal transaminases surprises.



Conclusion:

- Being the main alarm signal for liver diseases or injury before enrolling further diagnostics, current LT thresholds might miss a significant part of liver pathologies.
- Current normal range limits should be re-assessed, to provide an improved focus concerning chronic liver disease.