Viraspillai J.

THE AST/ALT RATIO AS A POTENTIAL BIOMARKER OF DYSGLYCEMIA AND DYSLIPIDEMIA IN PATIENTS WITH MASLD.

Tutor: PhD, Associate Proessor Arsentyeva I.L.
Department of Propaedeutics of Internal Disease,
Belarussian State Medical University, Minsk.

The enzymes alanine aminotransferase (ALT) and aspartate aminotransferase (AST) catalyze the transfer of amino groups—ALT from alanine and AST from aspartate—to ketoglutaric acid. While both are released into circulation upon hepatocellular injury, their tissue distribution differs significantly. ALT is predominately liver-specific. Clinically, an upper reference limit for ALT (alanine aminotransferase) of approximately 35 IU/L for males and 25 IU/L for females is commonly utilized.

The foundational work by Torres et al. (2012) established the AST/ALT ratio as a key component of non-invasive fibrosis scores, demonstrating its utility in identifying advanced liver disease. Specifically, a ratio of ≥0.8 is a core variable in the BARD score, where it demonstrated strong predictive performance for stage 3-4 fibrosis with an area under the receiver operating characteristic curve (AUROC) of 0.83. Crucially, this review confirmed that the primary drivers of advanced fibrosis are the metabolic conditions central to this research—diabetes mellitus (dysglycemia) and obesity (a component of dyslipidemia). This link is further exemplified by the NAFLD fibrosis score, which explicitly combines the AST/ALT ratio with impaired fasting glucose/diabetes, directly connecting the ratio to a state of dysglycemia.

More recent data from a large-scale Chinese cohort by Chen et al. (2025) provides contemporary evidence for the association of the AST/ALT ratio with both dysglycemia and dyslipidemia in MASLD. The study demonstrated that the AST/ALT (De-Ritis) ratio is significantly decreased in MASLD patients compared to healthy controls and exhibited a strong predictive capacity for the disease (AUROC 0.780). Its utility was reinforced by significant correlations with key metabolic indicators; fasting blood glucose (FBG) and triglycerides (TG) were identified as independent risk factors for MASLD (OR 1.213 and 1.640, respectively). Furthermore, the study highlighted the concept of subclinical progression, noting that a substantial majority of MASLD patients present with liver enzymes within the conventional normal range, thereby underscoring the potential of the AST/ALT ratio as a more sensitive integrated biomarker for early metabolic dysregulation.

The clinical relevance of aminotransferases is further underscored by intervention trials demonstrating that antidiabetic agents (e.g., GLP-1 analogues, SGLT2 inhibitors) improve glycemic control while simultaneously reducing serum aminotransferase levels, reflecting an amelioration of hepatic steatosis. Consequently, the AST/ALT ratio emerges not merely as a static marker of liver damage, but as a dynamic indicator of systemic metabolic stress driven by IR, with alterations potentially signaling the transition from simple steatosis to more inflammatory and fibrotic stages of MASLD associated with worsening dysglycemia and dyslipidemia.

In conclusion, the evidence synthesized from foundational and contemporary studies robustly supports the role of the AST/ALT ratio as a valuable, inexpensive, and readily available biomarker in the context of MASLD. The consistent association of the ratio with dysglycemia (T2DM, FBG) and dyslipidemia (TG), coupled with its ability to capture subclinical pathological changes, positions it as an integrated marker of cardio-hepato-metabolic risk. Future research should focus on validating specific cut-off values for predicting incident metabolic disease and on incorporating the AST/ALT ratio into multi-marker panels to enhance risk stratification and guide early, personalized interventions in at-risk populations.