

New Technologies - Biomarkers and Prediction Models

Noninvasive biomarkers in NAFLD and NASH - current progress and future promise

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Nonalcoholic fatty liver disease (NAFLD) is a growing global health concern affecting 30% of adults worldwide, making it the most common chronic liver disease. NAFLD can progress to nonalcoholic steatohepatitis (NASH), which is characterized by hepatic necroinflammation and faster fibrosis progression. NASH can lead to end-stage liver disease, and with the emergence of pharmacological treatments for NASH, there is a pressing need for non-invasive biomarkers for prognostication, patient selection, and treatment monitoring. Liver biopsy, the current gold standard for diagnosis, has limitations due to its invasive nature, poor patient acceptability, and sampling variability.

Recent advancements in imaging techniques, such as transient elastography, magnetic resonance elastography, and ultrasound elastography, have shown promise in assessing liver fibrosis noninvasively. Imaging biomarkers, including proton density fat fraction and magnetic resonance spectroscopy, can assess steatosis. Additionally, serum biomarkers, such as alanine aminotransferase, gamma-glutamyl transferase, and cytokeratin-18, have been studied for their potential in detecting necroinflammation. Genetic biomarkers, such as the patatin-like phospholipase domain-containing protein 3 (PNPLA3) and transmembrane 6 superfamily member 2 (TM6SF2) variants, have been associated with an increased risk of NAFLD and NASH.

Omics-based approaches, including genomics, transcriptomics, proteomics, and metabolomics, are promising tools for discovering new biomarkers for NAFLD and NASH. These approaches can identify novel pathways and targets for therapeutic interventions. However, the discovery and validation of omics-based biomarkers require large-scale, multicentre studies to ensure accuracy, reproducibility, and feasibility.