The Clinical Presentation of 15,172 Cases with Metabolic Dysfunction-associated Steatotic Liver Disease (MASLD) in a Large Electronic Health Record (EHR)-linked Cohort in the United States

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Abstract

Background and Aims: Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD) affects approximately 32% US adult population. This study assessed seven metabolic risk factors (MRFs) in parallel, and by ethnicity and age, and clinical presentations of MASLD using All-of-Us (AoU) data.

Approach and Results: MASLD group (n=15,060) and matched control group (n=75,300) were used for this case-control study. The frequency of MASLD was 6.0%. Compared to the control group, MASLD had independently and significantly higher frequencies of obesity (66.1% vs. 41.3%), type 2 diabetes (T2DM, 39.5% vs. 16.9%), hypertension (64.3% vs. 38.6%), hyperlipidemia (59.8% vs. 37.3%), obstructive sleep apnea (OSA, 28.9% vs. 13.4%), hypothyroidism (21.2% vs. 13.4%), and type 1 diabetes (T1DM, 4.3% vs. 1.9%). Obesity was identified as the strongest independent MRF in Asians, Whites, and Hispanics especially in those < 50 of age. Hypertension was found to be the strongest independent MRF in Blacks. MASLD carries significantly higher frequencies of cardiac events, including coronary artery disease (17.1% vs. 9.4%) and myocardial infarction (7.1% vs. 4.2%); hepatic events, including cirrhosis (7.5% vs. 1.1%) and hepatocellular carcinoma (0.5% vs. 0.1%), and elevated ALT (27.7% vs. 10.1%), AST (18.0% vs. 6.4%), and ALP (19.8% vs. 13.1%) in comparison to the control group.

Conclusions: Our study demonstrated obesity, hypertension, hyperlipidemia, T2DM, OSA, hypothyroidism, and T1DM are all the independent MRFs for MSALD sequential, but the rank of these MRFs by odds ratios could vary by ethnicity and age. MASLD presents with significantly higher rates of ALT, AST, ALP elevation, cardiac and hepatic events.