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Understanding insulin resistance in NAFLD: A systematic review and meta-analysis focused on homa-ir in South Asians

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Non-alcoholic fatty liver disease (NAFLD), a metabolic condition, is becoming increasingly common in South Asia. While its clinical diagnosis primarily relies on sonography and altered hepatic biomarkers, the significance of non-hepatic indicators, such as HOMA-IR, in relation to NAFLD requires further examination in the South Asian population due to ethnic differences in these markers. This study examined the relationship between insulin resistance, quantified using the Homeostasis Model Assessment of Insulin Resistance (HOMA-IR), and NAFLD, along with other non-hepatic biomarkers. A thorough literature review was conducted in accordance with the PRISMA guidelines. We searched PubMed, Embase, and Google Scholar databases, yielding 287 articles. After applying the selection criteria and screening, 22 studies were selected for inclusion in the analysis. We extracted and meta-analyzed the data on HOMA-IR in patients with NAFLD along with other relevant parameters. The Newcastle-Ottawa Scale (NOS) was used to assess the quality of observational studies, whereas the RoB 2.0 tool was employed for randomized controlled trials. The systematic review uncovered that individuals with NAFLD demonstrated statistically significant elevations in HOMA-IR levels, with a weighted mean difference (WMD) of 1.28 (95%

CI: 1.00 to 1.58; I² = 98%, p < 0.0001) when compared to healthy subjects. Additionally, NAFLD patients showed markedly higher fasting blood glucose levels, with a combined mean difference of 15.64 mg/dL (95% CI: 11.03 to 20.25; I² = 92%, p < 0.0001). The analysis also revealed increased triglyceride levels in NAFLD patients, with a pooled mean difference of 42.49 mg/ dL (95% CI: 29.07 to 55.91; I² = 97%, p < 0.0001), and elevated C-reactive protein levels, with a pooled mean difference of 2.17 mg/L (95% CI: 2.01 to 2.33; I² = 23%, p < 0.0001). Interestingly, subgroup analysis indicated that obese NAFLD patients exhibited significantly higher HOMA-IR levels than their non-obese counterparts, with a weighted mean difference of 5.85 (95% CI: 4.88 to 6.81; I² = 0%, p < 0.0001). Variations in study methodology, diagnostic techniques, and subject demographics were identified as sources of heterogeneity. The analysis found little evidence of publication bias, which lends credibility to the results. In South Asian populations, higher HOMA-IR, TyG, and CRP levels are associated with an increased risk of NAFLD. To improve the understanding and treatment of NAFLD in this specific demographic group, it is necessary to establish uniform diagnostic criteria and conduct additional studies, particularly RCTs.

Biography

Dr Margeyi M. Mehta is working as a doctor in SSG Hospital and Govt. Medical College, Vadodara, GJ, India