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Predictive Performance of Cardiometabolic Indices for Metabolic Syndrome among Adults in Northern Sri Lanka.

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Introduction and Objectives: Metabolic syndrome (MetS) raises cardiovascular and Type 2 diabetes risk in South Asia. Simple indices enhance early detection and risk stratification. This study assessed the predictive performance of Atherogenic Index of Plasma (AIP), Lipid Accumulation Product (LAP), Visceral Adiposity Index (VAI) and Cardiometabolic Index (CMI) in identifying MetS.

Methods: A community-based cross-sectional study was conducted among 753 adults from rural and urban Northern Sri Lanka. Anthropometric and biochemical measurements were made using standardised procedures and cardiometabolic indices were calculated using established formulas. MetS was defined by IDF criteria. Associations were assessed using logistic regression, and predictive performance was evaluated using Receiver Operating Characteristic (ROC) curves.

Results: All the cardiometabolic indices were significantly associated with MetS ($p < 0.001$). In age- and gender-adjusted models, AIP showed the strongest association ($OR = 72.58$), followed by CMI ($OR = 14.63$), VAI ($OR = 2.05$), and LAP ($OR = 1.08$). ROC analysis demonstrated that LAP had the highest diagnostic performance ($AUC = 0.904$), followed by CMI ($AUC = 0.833$), VAI ($AUC = 0.818$), and AIP ($AUC = 0.777$). The optimal cut-off values were 32.84 cm.mmol/L for LAP (sensitivity 88.9%, specificity 78.5%), 0.615 for CMI (sensitivity 79.3%, specificity 75.2%), 1.985 for VAI (sensitivity 78.8%, specificity 74.1%), and 0.055 for AIP (sensitivity 76.4%, specificity 70.5%).

Conclusion: All indices were significantly associated with MetS, though predictive performance varied. LAP showed the best performance and may be preferred for screening, while other indices can support risk assessment in a low middle income country like Sri Lanka.