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E-POSTER DISPLAY

PD-1

Beyond HOMA-IR: Waist Circumference and BMI as Practical Clinical Predictors of Insulin Resistance in a Multiethnic Cohort

Karniza Khalid, Badariah Ahmad, Anuar Zaini Md. Zain

Jeffrey Cheah School of Medicine and Health Sciences, Monash University Malaysia

Corresponding Author email: karniza.bintikhali@monash.edu

Introduction:

Insulin resistance (IR) drives obesity-related complications, yet gold-standard measures like HOMA-IR are resource-intensive and often unavailable in routine practice. Identifying simple, practical clinical predictors is critical, particularly in diverse, multiethnic populations where demographic factors influence anthropometric interpretation.

Methods:

We conducted a post-hoc analyses of 97 adults from three publicly available metabolic datasets (Middle Eastern 38%, Caucasian 40%, Asian 5%). Mean age was 30.5±11.5 years; 42% male. Anthropometric (waist circumference [WC], BMI, % body fat), metabolic (triglycerides, HDL, glucose), and blood pressure parameters were assessed. IR was defined as HOMA-IR ≥75th percentile of the dataset, determined at 3.425. Receiver-operating characteristics (ROC) analyses evaluated discriminative ability, and stepwise (forward) linear regression identified independent predictors in the overall cohort and in sex-stratified models.

Results:

WC (AUC 0.964), BMI (AUC 0.946), and % body fat AUC (0.902) demonstrated excellent discrimination; triglycerides were moderate (AUC 0.742). Optimal ROC cutoffs were WC 101 cm overall (102.8 cm in females, 94.9 cm in males), BMI 34.9 kg/m², and % body fat 36.2%, with WC and BMI showing high sensitivity (95-96 %) and specificity (86-89 %) to identify IR. Stepwise regression revealed BMI as the sole independent predictor of IR in the overall cohort (B=0.22, 95% CI: 0.17-0.26, p<0.001; R²=0.56). Sex-stratified models showed WC (B=0.049, 95% CI: 0.03-0.07, p<0.001) and triglycerides (B=0.01, 95% CI: 0.004-0.017, p=0.002; R²=0.65) in males, and WC alone (B=0.104, 95% CI: 0.078-0.130, p<0.001; R²=0.64) in females. % body fat, HDL, glucose, and blood pressure showed weaker or non-independent associations with HOMA-IR.

Conclusion:

In this multiethnic cohort, simple anthropometric measures, particularly WC and BMI, strongly predict IR. The slightly higher WC cutoff in females likely reflects the dataset's small sample size, higher female BMI, and multiethnic composition. Although bioimpedance-derived parameters, such as % body fat showed good discrimination, they did not remain independent predictors in multivariate models.