

## Utility of CholIndex and Castelli risk indices in diabetes mellitus assessment

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**Statement of the problem:** Beyond classical lipid profile, there are new predicting risk fractions, which are investigated in the Diabetes Mellitus (DM) clinical setting, such as CholIndex, Castelli Risk index I (CRI) and Castelli Risk Index II (CRII). The aim of the study was to find if CholIndex, CRI and CRII could be useful biomarkers in DM assessment.

**Methodology:** Observational cross-sectional study was on 419 patients, over 65 years, of which 238 DM and 181 healthy control patients. CholIndex was calculated as  $\text{LDL-HDL} (\text{TG} < 400 \text{ mg/dL})$ ;  $\text{LDL-HDL} + 1/5 \text{ of TG} (\text{TG} \geq 400 \text{ mg/dL})$ . CRI was calculated by  $\text{TC/HDL}$  and CRII by  $\text{LDL/HDL}$ . Cut-off limits: CholIndex < 2.07; CRI < 3; CRII < 3.3.

**Findings:** Data revealed an increase of CholIndex ( $p < 0.05$ ), CRI and CRII ( $p < 0.0001$ ) at DM patients vs. control; low levels of HDL ( $p < 0.0001$ ) and high of TG ( $p < 0.0001$ ). Linear regression equations showed a positive correlation of CholIndex with CRI and CRII ( $p < 0.0001$ ) at DM patients, besides also positive correlation with lipid panel. Diagnostic evaluation for CRI indicated: 62.77% assay accuracy, 82.77% sensitivity, 36.46% specificity, 56.80% disease prevalence and relative risk estimate=1.3. For CRII: 50.6% assay accuracy, 25.63% sensitivity, 83.43% specificity, 56.80% disease prevalence and relative risk estimate=2.06. Multivariate logistic regression analysis showed that patients with high CRI are 2.75 times more likely to have DM compared to those with low risk [OR 2.75, 95% CI: 1.75-4.33;  $p < 0.0001$ ]. Also, patients with high risk CRII have 1.73 times to develop DM [OR 1.73, 95% CI: 1.06-2.82;  $p < 0.005$ ]. At DM, even if TC and LDL were in reference range, risk indices were high.

**Conclusion:** There is a certain correlation between CholIndex, CRI, CRII and DM, the higher the risk the more likely it is to develop DM. So, studied indices could be useful and reliable biomarkers for DM assessment.