

Comparison of LDL-cholesterol estimate using the Friedewald formula and the newly proposed de Cordova formula with a directly measured LDL-cholesterol in a healthy South African population.

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Abstract

BACKGROUND:

The accurate determination of low density lipoprotein cholesterol (LDL-c) is pertinent in clinical practice. Most laboratories employ the Friedewald formula, for convenient estimation of LDL-c, despite its shortfalls. Different formulae have been proposed for use, for more accurate but convenient estimation of LDL-c. Here, we compare a new formula recently proposed by de Cordova et al., with that of Friedewald and LDL-c determined by a homogeneous assay. We also assess its performance at very low TG levels against the modified Friedewald formula recommended by Ahmadi et al.

METHODS:

A database of 587 adults from the 'Establishing Reference Intervals for Selected Analytes in South Africa' study was utilized. Fasting samples were assayed for lipids. LDL-c was determined by the Daiichi method. Performance of the Friedewald and the de Cordova formulae was compared. This was exclusively repeated at very low TG levels (<1.13 mmol/L), this time, including the Ahmadi formula.

RESULTS:

The Friedewald formula and the de Cordova formula both had high correlations with the direct LDL-c ($r = 0.98$ and $r = 0.97$, respectively), although the latter showed an inconsistent bias at different LDL-c levels. The two formulae had a higher correlation ($r = 0.98$) than the Ahmadi formula ($r = 0.92$) at very low TG levels.

CONCLUSIONS:

The Friedewald formula showed better agreement with the direct LDL-c than the de Cordova formula, at various LDL-c levels, in our population. It also performed better than the Ahmadi formula at very low TG levels. We therefore advise that it remains the formula of choice for LDL-c estimation in South Africa.