Diagnosing Polycystic Ovary Syndrome Using Triglyceride-Related Indices: Is It Possible Without Rotterdam Criteria?

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Polycystic ovary syndrome (PCOS) is a common complicated hormonal condition of the women in reproductive age with a prevalence of 5–15% (1). Its characteristic features include polycystic ovary morphology under sonography, ovulatory dysfunction, and hyperandrogenism (2). Irrespective of reproductive disorders, it was reported that PCOS is implicated with the disorders of metabolism such as type 2 diabetes (T2DM), cardiovascular diseases, and impaired glucose tolerance (3). In PCOS, the tendency for fat accumulation in intraabdominal stores of fat is frequently observed, and it is linked to an increased risk of cardiovascular disorders and T2DM (4). A woman with PCOS usually visit the physician for reasons such as obesity, hair loss, hypertension, impaired glucose tolerance, and hyperlipidemia. On the other hand, the exact diagnosis of PCOS is made by a gynecologist according to the Rotterdam consensus criteria (5) at the end. Its early detection using simple markers by other medical disciplines rather than the gynecologists will reduce the burden attributable to metabolic risks.

It was reported that the conventional ratios of lipid such as low-density lipoprotein cholesterol (LDL-C)/ high-density lipoprotein cholesterol (HDL-C), total cholesterol (TC)/ HDL-C, triglycerides (TG)/HDL-C, and fasting TG are elevated in PCOS patients (6). In insulin-resistant (IR) states, delayed TG-rich lipoprotein clearance from blood plasma results in hypertriglyceridemia (7).

The triglyceride glucose (TyG) index is obtained by the formula: napierian logarithmic (ln) [fasting TG (mg/dL) × fasting blood glucose (FBG) (mg/dL)/2] and it was firstly reported as an index to identify IR (8). TyG index predicts glycolipid-metabolism-related diseases efficiently (8). Triglyceride glucose-body mass index (TyG-BMI) has been recently reported to be a helpful marker in early detection of T2DM risk, which is a common phenomenon in PCOS (9, 10). TyG-BMI, calculated as [TyG × BMI], was also shown as a non-invasive, simple, and cost-effective tool for separating the patients with non-alcoholic fatty liver disease from the ones without this disease, accurately (11). Lipid accumulation product (LAP) index was described as an indicator to identify adults with cardiovascular risk (12). It is a simple index for over accumulation of lipid and its formula is [(waist circumference - WC- in cm – 58) × fasting TG concentration (mmol/L)] (12).

Zheng et al reported in 2022 that TyG-BMI and TyG index were used to predict IR in Chinese PCOS patients (7). They also showed that TyG-BMI and TyG index were significantly higher in PCOS patients but they could not found an appropriate cut-off value (7). Kheirrollahi et al. recently claimed that in Iranian PCOS women, TyG strongly predicted HOMA-IR with area under the curve (AUC) of 0.623 (P < 0.05) (1) but they did not use TG related markers in the diagnosis of PCOS. Wehr et al. claimed that in age-adjusted analyses, LAP levels of Austrian PCOS women were higher than those of controls and added that the best cutoff value for LAP for defining impaired glucose tolerance was revealed by ROC curve analyses (13). The results with LAP is very encouraging for its possible role in early detection of cardiometabolic risk together with IR and it may help to assess hyperandrogenism in lean Turkish PCOS women (14). However, there was not any data about early diagnosing PCOS using TG-related indices like TyG, TyG-BMI and LAP.

As a result, the exact diagnosis can be delayed in some of women with PCOS, but TG related markers cannot be used as early objective diagnostic markers for PCOS for time being.
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Conflict of Interests
None.

Ethical Issues
Not applicable.

References