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EDITORIAL

Focus on cardiometabolic risk factors

This issue of Acta Cardiologica is dedicate to cardiometabolic risk factors. Cardiovascular disease (CVD) is the leading cause of death globally. Advancements in the treatment of CVD have reduced mortality rates, yet the global burden of CVD remains high [1]. Cardiometabolic risk refers to risk factors that increase the likelihood of experiencing vascular events or developing diabetes. This notion includes traditional risk factors integrated in risk calculators, such as hypertension, dyslipidemia, and smoking, as well as emerging risk factors, such as abdominal obesity (measured by waist circumference), insulin resistance, inflammatory profile as measured by high-sensitivity C-reactive protein (hsCRP) levels, lack of consumption of fruits and vegetables, sedentary lifestyle, psychosocial stress and ethnicity [2,3].

The importance of healthy lifestyle behaviours in the prevention of CVD has been well characterised. In their study, Menotti et al. examined the relationships between three major lifestyle behaviours with cardiovascular mortality in a cohort of middle-aged men. A total of 1712 men were enrolled and examined in 1960, and behavioural habits were measured: smoking habits, physical activity and diet. Follow-up for life status, mortality and causes of death was extended for 61 years and only one man was lost to follow-up after 50 years when he was aged 91 years. The authors showed that there was a clear association between smoking habits, physical activity and diet and lifetime mortality from coronary heart disease, while only smoking habits were significantly associated with mortality from stroke [4].

Hypertension is a well-established major risk factor for CVD and has a multifactorial origin. Hypertension prevalence is higher in low- and middle-income countries than in high-income countries. Moreover, the prevalence of hypertension varies according to occupation. In Iran, its prevalence is remarkably high among professional drivers [5]. Temporary exposure to moderate altitude results in mild changes in vascular tone reflected in pulse pressure and pulse wave amplitude in healthy adults, all of which may contribute to a greater risk of hypertension [6]. Many lifestyle behaviour changes have been shown to reduce blood pressure as salt restriction, moderation of alcohol consumption, the high consummation of vegetables and fruits, weight reduction and maintaining ideal body weight and regular physical activity [7]. Humbert et al. investigated the associations between lifestyle, anthropometric and biological measurements and blood pressure in the Gubbio residential study. Gubbio is a medieval hill town, in Italy, with a well-preserved wall-enclosed central area. The entire population aged 5 and over residing within the walls was invited to participate in the Gubbio register. A total of 3183 persons were included (48% men, 43 ± 17 years old). The authors showed that in addition to age, body mass index (BMI) was associated with hypertension in both sexes while sex differences were observed in the associations between serum uric acid, fasting blood glucose and hypertension [8]. To note, women have a worse risk factor profile, both in Belgian and in other European high-income countries [9].

Serum calcium (Ca) and insulin resistance (IR) can have an impact on each other and both are associated with acute coronary syndrome (ACS). The triglyceride-glucose (TyG) index is a surrogate marker of IR that can be easily calculated from fasting glucose and fasting triglyceride. Şaylık et al. investigated the temporal relationship between serum Ca and the TyG index and its impact on ACS development in 2856 patients. The authors showed that there was a reciprocal temporal relationship between serum Ca and the TyG index, and both were associated with the risk of incident ACS [10].

A close link exists between diabetes and CVD, which is the most prevalent cause of morbidity and mortality in diabetic patients [11]. Diabetes and carotid arterial plaque (CAP) incidence are related. In a study involving 9275 patients with coronary disease, Cheng et al. showed a correlation between HbA1c levels and CAP incidence in both pre-diabetic and diabetic subjects (Figure 1). The authors also emphasised the influence of increased HbA1c on CVD risk [12,13].

Assessment of cardiovascular risk using established risk scores such as European Society of Cardiology (ESC) SCORE2 or PROCAM insufficiently emphasise the role of genetic factors. In their study, Krohn et al. showed that both scores failed to adequately discriminate between stable and unstable disease patients with ACS, highlighting the need for optimised risk prediction models involving emerging risk modifiers such as genetic factors or inflammation. Conversely, these authors showed that commercially available assays for genetic polymorphisms may offer useful information on a person's hereditary risk for CVD, which could help direct future primary and/or secondary preventative therapy for coronary artery disease [14,15]. High plasma concentrations of lipoprotein (a) are associated with an increased cardiovascular risk. Current guidelines recommend the measurement of only a single Lp(a) in an individual's lifetime under specific circumstances to improve cardiovascular risk prediction. In

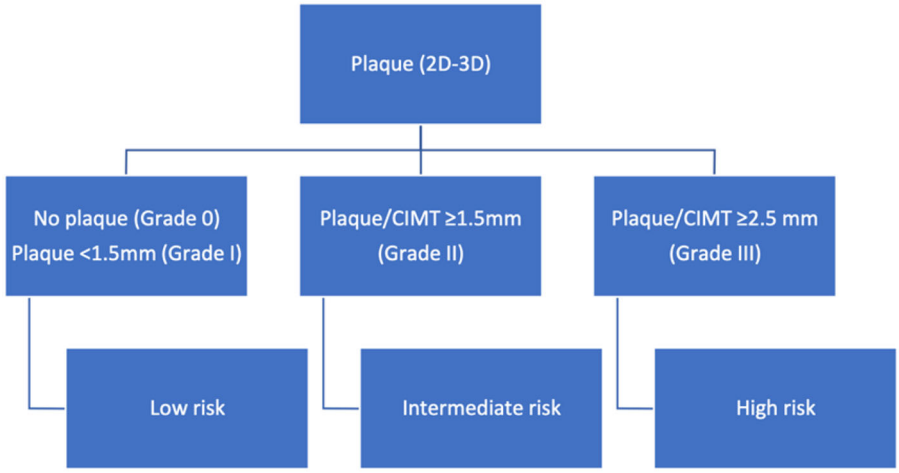

Figure 1. Stepwise CVD risk stratification pathway using plaque grading by 2D/3D ultrasound (from reference 13].

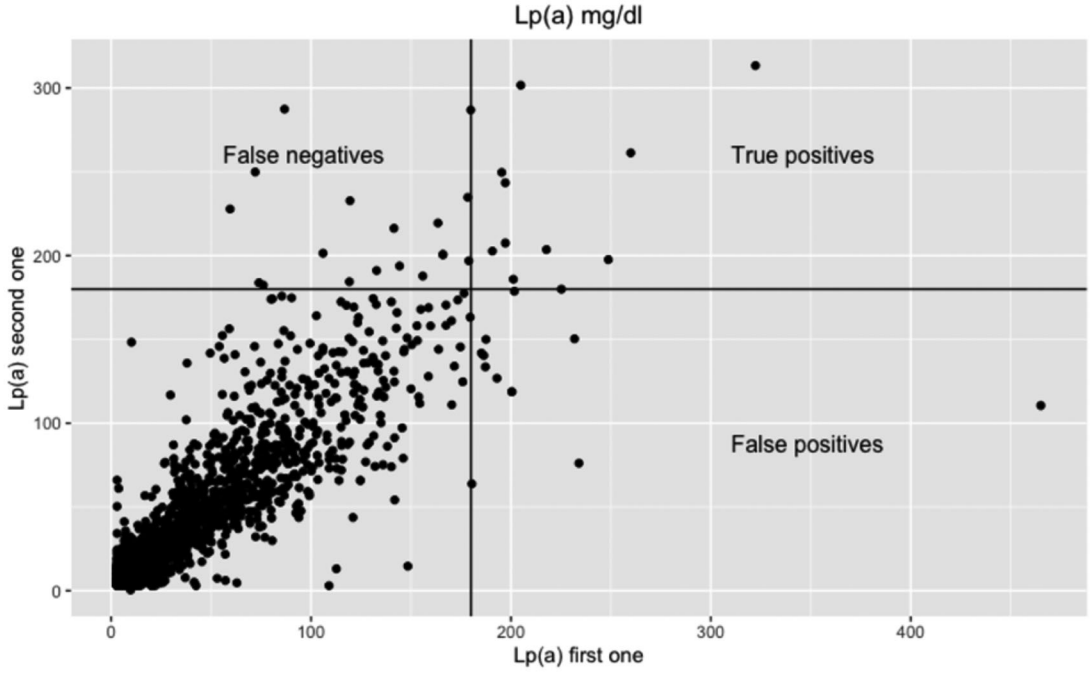

Figure 2. Comparison of the two Lp(a) measurements. The black lines correspond to the limit of 180 mg/dL, differentiating between false negatives and false positives (from reference 16].

their study, Deconinck et al. examined the number of false positives and negatives missed through only a single measurement of Lp(a). The authors reported that the determination of Lp(a) was reproducible and that a single measurement was sufficient to assess whether a patient exceeded cut-off values [16] (Figure 2).

Considering that CVD is still largely a preventable disease, prioritising preventative measures is necessary to lessen the burden of CVD. Beyond healthy lifestyle behaviours, current strategies for the prevention and management of CVD focus on reducing low-density lipoprotein cholesterol (LDL-C) levels. In their study, van de Borne et al. reported a large gap between the LDL-C goals advocated by the ESC/European Atherosclerosis Society guidelines and the levels achieved in routine clinical practice in Belgium (Figure 3) [17].

Glucagon-like peptide-1 receptor agonists (GLP-1RAs), a group of novel antidiabetic agents, demonstrated beneficial cardiovascular effects in recent large, placebo-controlled randomised clinical trials (RCTs) [18]. In patients with type 2 diabetes mellitus, treatment with GLP-1RAs does not significantly affect the risk for major cardiac arrhythmias [19]. The abnormal composition of the gut microbiota is linked to the pathogenesis and propagation of CVD and CVD risk factors. Nagarajan's review discussed various aspects of the interaction between the microbiome and the immune system in order to reveal causative links relating dysbiosis and autoimmune diseases

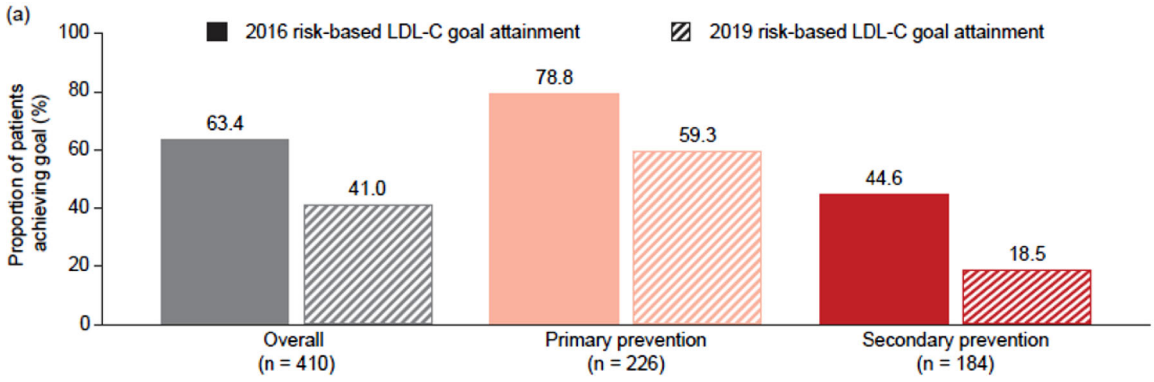

Figure 3. Risk-based LDL-C goal attainment in primary and secondary prevention patients (from reference 17].

with special emphasis on rheumatic heart disease [20]. Hypothyroidism can result in decreased cardiac output, increased systemic vascular resistance, decreased arterial compliance, and atherosclerosis. Subclinical hypothyroidism is a highly prevalent disease worldwide but remains challenging to diagnose. The influence of subclinical thyroid dysfunction on the heart and cardiovascular system has been much less studied, necessitating additional studies [21]. Beta-blockers block are widely prescribed for angina, heart failure and some heart rhythm disorders, and to control blood pressure. In patients with myocardial bridge, beta-blockers have a beneficial effect on left ventricular function [22].

Disclosure statement

No potential conflict of interest was reported by the author(s).

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