Summary

Polycystic ovary syndrome (PCOS) is a complex reproductive disorder with the consequent clinical and metabolic derangements. In the natural disease course, an increased cardiovascular risk has to be anticipated in a metabolically unstable condition.

Among risk factors, dyslipidemia is certainly the most persistent with high prevalence. Consequently, it is reasonable to conclude that women with PCOS may indeed be at significantly increased risk for developing coronary heart disease. The effect of aging on the pattern of dyslipidemia in PCOS, with increase of total cholesterol and low-density lipoprotein (LDL)-cholesterol, is causing almost stable cardiovascular risk over a lifetime. Predominant observation of the most studies in women with PCOS was an elevation of LDL-cholesterol in both lean and obese patients. Decreased concentrations of total high-density lipoprotein (HDL) was found in obese patients with PCOS from the third decade of life onward, whereas triglycerides start to rise from the second decade of life in both younger and older subgroups. Prevalence of metabolic syndrome was 43–46% in women with PCOS, with lipid abnormalities as the most frequent component of the syndrome.

Women with PCOS have 7.4-fold relative risk for myocardial infarction. Different surrogate tools could be of clinical importance in evaluation of the cardiovascular derangement. Therapeutic interventions, including dietary regimens and exercise, led to amelioration of dyslipidemia, whereas some therapeutic agents, such as metformin, troglitazone, and antiobesity drugs as adjuvant therapy, did not succeed in improvement of the lipid profile. Novel intervention modalities with confirmation in longitudinal studies are needed in prospect for more specific and efficacious amelioration of lipid profile in women with PCOS.

Key Words: PCOS; lipids; metabolic syndrome; atherosclerosis; cardiovascular risk.
INTRODUCTION

Polycystic ovary syndrome (PCOS) is today acknowledged by many investigators to be the most common endocrine disorder among women of reproductive age and the major cause of anovulatory infertility (1). Reproductive consequences of PCOS have been recognized for several decades, although in the last two decades, an increasing number of studies demonstrated an association between the syndrome and a characteristic metabolic disorder. That, in turn, has led to concern about the effect of PCOS on long-term health, particularly with regard to diabetes and coronary heart disease.

The central features of the metabolic disturbance are peripheral insulin resistance and hyperinsulinemia, with the evidence of causative abnormalities in both insulin action and pancreatic β-cell function (2). These metabolic features, together with centripetal fat distribution, constitute a cluster of risk factors for cardiovascular disease and have been a major concern in considering the long-term management of patients with PCOS. The finding of disturbances in lipid and lipoprotein metabolism is fairly common in women with PCOS. However, interpreting the relevance of these abnormalities in terms of cardiovascular risk is not easy. First, there are inconsistencies among studies in the features of the dyslipidemia. Second, it is not yet clear how the combined risk factors translate into a real risk of developing cardiovascular disease (3).

Therefore, it is necessary to address both physiological issues of the metabolism of lipoproteins and their specificities between the sexes at the onset of reproductive period and in further life, and the specific pattern of the lipid metabolism in PCOS, as the most common disorder of the female reproductive period. As previously mentioned, the role of lipids in the possible early atherosclerosis in PCOS is still controversial issue.

METABOLISM OF LIPOPROTEINS

Lipoproteins are macromolecular aggregates of lipids and apolipoproteins. Lipids can be divided into two main groups: simple and complex. The two most important simple lipids are cholesterol and fatty acids. Lipids become complex lipids when fatty acids undergo esterification to produce esters (4,5).

Simple Lipids

Cholesterol is a soft waxy substance present in all cells of the body. Cholesterol is synthesized primarily in the liver and small intestine. Fatty acids are the simplest form of lipid found in the body and are an important energy source. They are present as saturated, monounsaturated, and polyunsaturated forms. Fatty acids exist freely in the plasma mostly bound to albumin, and could be stored in adipose tissue as triglycerides (4).

Complex Lipids

Triglycerides are mainly stored in adipose tissue and are the main lipid currency of the body. Phospholipids are glycerol esters being an important component of the cell membrane (4).

Apolipoproteins

In order for the water-insoluble lipids to be transported around the body in the aqueous medium (blood), they are aggregated with apolipoproteins to form lipoproteins. These