Foreword

Hyperandrogenism in women is a fascinating field of study that includes several different clinical and pathophysiological entities. It profoundly affects women's lives from lowering their self-esteem to changing their cognition and their affective motivation, from affecting their strength to being responsible for infertility.

Undoubtedly, the polycystic ovary syndrome (PCOS) is the most common androgen excess disorder worldwide, and although this disorder is not the main focus of this book, some particular aspects are still discussed.

One relevant part of this book focuses on understanding the role of androgen excess on adipose tissue in females and on the mechanistic perspectives based on a developmental commonality preceding PCOS, with specific interest on in utero origins of this disorder and on specific genetic and epigenetic background. Some phenotypic and molecular convergence between highly related species suggests not only dual genetic and epigenetic contributions to a developmental origin of PCOS but also common molecular pathogenesis extending beyond humans.

Recent advances provided by proteomic and metabolomic studies have the potential advantage over genomics of integrating genetic and epigenetic influences, thereby facilitating the interpretation of the molecular mechanisms and pathways involved in the pathogenesis of PCOS. Therefore, these techniques have the potential advantage of integrating genetic and epigenetic influences, providing a global vision of the biological systems. Definitely, proteomics and metabolomics may provide great advantages compared with targeted approaches in the definition of key pathways of complex metabolic disorders such as PCOS or conditions of androgen excess related to adolescent obesity as well as adult obesity during the fertile age and even after menopause. Androgen excess may also negatively impact insulin sensitivity in women, as well as body composition and metabolism. These aspects are of great importance to understand the role of androgen excess in the development of different obesity phenotypes, in order to provide specific pathophysiological mechanisms related to the susceptibility to develop metabolic disorders, chiefly the metabolic syndrome and, particularly, type 2 diabetes.

In women, obesity per se may represent a condition of androgen excess, particularly if it develops during adolescence. For example, PCOS in adolescent girls may present in heterogeneous ways, which may often lead to an excess of diagnosis and, above all, not to take into account the fact that the presence of obesity can, in itself, be associated with an excess of androgens of various origins (ovarian and/or adrenal). The concept that obesity in both adolescents as well as in young adult women, may be characterized by the presence of androgen excess which, in turn, may favor the development of metabolic disorders, should be considered a potential important factor favoring metabolic disorders later throughout the woman's lifetime.

A specific condition in women is represented by the development of obesity and abdominal fatness, which is characterized by an increase in testosterone blood levels, secondary to chronic stress exposure in both adult and adolescent girls. Undoubtedly, it should merit much more attention by clinicians worldwide.

Intriguingly, there are serious arguments to support the concept that obesity contributes to the development of PCOS in susceptible individuals, as confirmed by the fact that sustained weight loss and its maintenance in the long term may lead to a total regression of the PCOS phenotype and the dysmetabolic profiles other than significant benefits of the reproductive function.

In women, there are many other disorders associated with androgen excess, which are often present in late adolescence or young adults. These include non-classic congenital adrenal hyperplasia, conditions of mild cortisol excess as well as adrenal adenomas, androgen secreting tumors (in these cases particularly during early menopausal years), as well as severe insulin-resistant states. These very important yet relatively uncommon endocrine disorders should be adequately understood and considered by clinicians before planning any therapeutic procedure.

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