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INOSITOL: A NEW PHARMACOLOGICAL TOOL FOR SEVERAL ISSUES IN PCOS

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Polycystic ovary syndrome (PCOS) is a complex syndrome characterized by reproductive and metabolic implications. Pharmacologic treatments target the hormonal and metabolic dysregulations associated to the disease such as insulin resistance, anovulation, hirsutism and menstrual irregularities. Inositol consists of nine stereoisomeric forms, all having a ring made by six carbons with a hydroxyl group attached to each carbon. Such stereoisomers are engendered through the epimerization of the hydroxy groups. Myo-inositol (MI) is the most important and widespread inositol. Also, D-chiro-inositol (DCI) deserves great attention; it is originated from MI by means of the epimerization of the C1 hydroxyl group, furthermore it exists at a 40:1 ratio between myo-inositol and D-chiro-inositol. This enzymatic reaction is controlled by insulin and acts in agreement with specific tissue necessities. MI in the ovary is involved in glucose uptake and FSH signalling while DCI works as inducer of testosterone synthesis under insulin stimulus. In insulin resistant PCOS women, hyperinsulinemia ends causing a severe growth of DCI concentrations from MI thorough the upregulation of epimerase activity in the ovary. MI could play a pivotal role in re-addressing both hormonal and metabolic parameters toward homeostasis, counteracting the symptoms and signs typical of this syndrome. In fact, our personal data showed an improvement of menstrual disorder, hirsutism and both a reduced ovarian hyperandrogenism and hyperinsulinism by six months of a combined treatment with MI+DCI. MI and DCI could represent an alternative important new tool for the management of metabolic and hormonal features in POCS, although longitudinal randomised studies along with prospective interventional trials may contribute to better clarify the role of this intriguing and safe new therapy.

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