

## **A. Weghofer**

### **Why follicles need adequate androgen levels.**

Polycystic ovary syndrome, frequently associated with hyperandrogenemia, is commonly aligned with infertility and impaired oocyte quality. Consequently, elevated androgen levels have long been considered detrimental for follicular development. Animal models in androgen receptor knockout mice as well as observational human studies have recently challenged this traditional concept, addressing the crucial role of androgens in follicular recruitment.

Current perceptions increasingly uncover the significance of physiological androgen ranges to allow for a synergistic interplay with follicle stimulating hormone (FSH), while androgen concentrations below or above an adequate range are considered disadvantageous. Androgen excess may disrupt advanced follicle development and maturation, while androgen deficiency is believed to curtail follicular recruitment, contributing to low functional ovarian reserve and, in extremes, to primary ovarian insufficiency. A number of clinical studies have addressed low androgen serum concentrations as target that can be therapeutically intervened. This lecture will highlight scientific evidence on the impact of androgen-receptor

mediated actions on follicular recruitment and outline current controversies on androgen treatment of premature ovarian senescence.

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#### **Does platelet-rich autologous plasma 'rejuvenate' ovaries and endometrium?**

Platelet-rich plasma (PRP) is an autologously derived blood product rich in growth factors, cytokines and platelets. In the aim to enhance wound repair, initial applications predominantly involved musculoskeletal trauma. During recent years indications have broadened from regenerative medicine to treatment approaches for alopecia, scar remodeling and skin rejuvenation.

Mechanisms of action are based on PRP's ability to stimulate cell proliferation, promote angiogenesis and curtail inflammation. After subdermal injection, PRP is believed to induce tissue remodeling with collagen and elastic fiber formation. A number of growth factors (GF) released by PRP's platelets, such as vascular endothelial growth factor (VEGF), epidermal GF, insulin-like growth factor 1 and 2 (IGF) and interleukins, are considered to mediate the pericellular microenvironment. PRP's proliferative components were recently reported to enhance

endometrial growth and exert beneficial effects in the course of endometrial regeneration in animal models. Among others, IGF and VEGF play crucial roles in ovarian physiology, act synergistically with androgens and thus affect follicular recruitment.

Cessation of fertility and menopause entail subtotal depletion of a woman's follicle pool. Tissue specimens from patients suffering from primary ovarian insufficiency (POI) also demonstrate a limited number of primordial follicles that restrain from recruitment. This lecture will critically evaluate current evidence on the impact of platelet-rich plasma on endometrial proliferation and follicular development and report preliminary results of a prospective randomized study that addresses this issue.