TITLE: Polycystic Ovary Syndrome, subclinical inflammation, DPP4 and the impact of a progestin test

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ABSTRACT

Introduction:
Women with PCOS frequently exhibit impaired insulin sensitivity. Low-grade chronic inflammation has been associated with insulin resistance and type 2 diabetes. DPP4, also known as CD26 (T-cell activation antigen CD26), is a prolin-specific serine exopeptidase that cleaves numerous chemokines, mitogens, neuropeptides and peptide hormones, affecting metabolism, immune and endocrine systems, as well as cell adhesion and tumour growth. Previous publications have found a 6-7% higher activity of DPP4 in PCOS vs. non-PCOS patients, and an influence of androgens on DPP4 transcription. Since progesterone is considered to possess anti-inflammatory effects, whereas estradiol promotes inflammation, we examined the effects of progestins on DPP4 and other markers of inflammation and insulin resistance.

Methods:
315 women with PCOS or hyperandrogenemia-related ovulatory dysfunction at the Technical University of Munich (TUM) were prospectively observed to assess the impact of a standardised progestin test on serum hormone levels and inflammatory markers, excluding women with menstrual cycle length ≥50 days, severe obesity (BMI >36 kg/m^2) and other endocrine or metabolic disorders, with five visits over three consecutive cycles for serum sampling and hormonal analysis. Initial assessments included medical history, ovarian scans and follicular phase serum samples, followed by a 14-day dydrogesterone test. Subsequent serum samples evaluated hormones and inflammatory markers at specific cycle intervals, focusing on CRP, sex hormones and the inflammation related proteins adropin and DPP4.

Results:
In a cohort of 27 PCOS women, a significant increase in ovulation rate was observed after exogenous progestin. Higher BMI groups showed greater CRP variability, indicating fluctuating inflammatory states. DPP4 activity revealed strong intra-category correlations over time. Adropin levels were lower in higher BMI groups and further reduced after progestin supplementation.

Discussion: This study demonstrates that in women with PCOS, BMI and progesterone therapy significantly influence hormone balance, ovulation patterns and inflammatory markers, with marked differences between BMI categories.

BIOGRAPHY

Born in Austria, Lisa Emmer discovered her fascination with the complexity of the human body early in life. This passion steered her towards a career in medicine, leading to her enrollment at the Ludwig Maximilian University in Munich, Germany. Her time in Munich was characterised by a rigorous academic commitment, laying a solid foundation for her future endeavours. During her medical studies, she discovered her fascination with endocrinology, particularly Polycystic Ovary Syndrome (PCOS). This curiosity culminated in her doctoral thesis (PhD), which explored the relationship between PCOS, chronic low-grade inflammation and diabetes. Despite her profound involvement in endocrine research, she harbored a long-held ambition to enter the field of surgery. This ambition led her to plastic surgery, a discipline that combined her precise skills with an artistic sensibility. Her venture into plastic surgery was driven not only by aesthetic considerations, but also by a desire to improve the overall quality of life for her patients. This dual commitment has allowed her to maintain a comprehensive approach to her surgical practice, considering her patients' hormonal and systemic well-being as well as their physical needs. Pioneering new approaches, she aims to integrate surgical precision, academic research and a holistic approach to health.

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