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OVARIAN VITAMIN D METABOLISM IS CONSERVED DESPITE SEASONAL VARIABILITY AND FOLLICULAR MATURATION.

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OBJECTIVE: The understanding of the metabolic mechanisms of vitamin D in the ovarian physiology is essential to evaluate its impact in the reproductive outcomes. 24,25-dihydroxyvitamin D (24,25-(OH)₂D) has been proposed as a good indicator of vitamin D status in serum, but until now its metabolic particularities in the reproductive system are unknown. We aimed to study the variations of serum and follicular concentrations of 24,25(OH)₂D₃ and 25(OH)D₃ depending of follicle size and season to better understand the vitamin metabolites behavior in the follicular microenvironment.

DESIGN: Prospective, non-interventional study.

MATERIALS AND METHODS: During autumn and winter months thirty- five egg donors were included in this study. Following controlled ovarian hyperstimulation with an antagonist protocol and standard doses of subcutaneous FSH, oocytes retrieval was done 36 hours after a bolus of GnRH agonist. Fluid from 20_2mm and 15_2mm follicles was collected and processed separately. Pooled follicular fluid (FF) from the rest of mature follicles and serum (S) samples were obtained. Quantification of 24,25(OH)₂D₃ and 25(OH)D₃ concentrations was performed in all samples through liquid chromatography-tandem mass spectrometry (LC-MS/MS) using a UPLC -TQ-S Xevo Waters system with a Waters Acquity BEH C18 (1,7mm 2,1 x 100mm) column. Concentrations of both Vitamin D metabolites in FF were compared to evaluate the follicle size effect. The season influence was also analyzed in S and FF. In both cases Wilcoxon test was used for mean comparisons.

RESULTS: Comparisons of mean values of metabolite concentrations during autumn and winter showed significant lower serum concentrations in winter ($p=0.0057$ for 24,25(OH)₂D₃ and $p=0.0028$ for 25(OH)D₃). Interestingly, these concentrations remained stable in the FF despite the season ($p=0.6073$ for 24,25(OH)₂D₃ and $p=0.1926$ for 25(OH)D₃). Similarly, when mean values of metabolite concentrations according follicle size were analyzed, no significant variations were observed ($p=0,2057$ for 24,25(OH)₂D₃ and $p=0,2626$ for 25(OH)D₃).

CONCLUSIONS: In this population of healthy and fertile women we confirmed a seasonal stability of 24,25(OH)₂D₃ and 25(OH)D₃ concentrations in the follicular fluid as well as stability during follicular maturation. Both results could be the expression of ovarian auto regulatory and protective mechanisms to cope against environmental metabolic variations.

The fact that serum vitamin D fluctuations due to season were not mirrored in the follicles suggests that vitamin D metabolism at specific levels may be required for optimal function and is thus conserved. Supported by: IVI RMA Fundaci_on IVI