P-670 Urine estrone-3-glucuronide (E3G) assay: is there any place during ovarian stimulation for IVF cycles?

I. Vladimirov[1,2], **V. Martin**[1], **T. Desislava**[1,2]

[1]*SBALAGRM-SOFIA, IVF unit, Sofia, Bulgaria ;*
[2]*Sofia University "St. Kliment Ohridski"- Sofia- Bulgaria, Faculty of Biology, Sofia, Bulgaria*

Study question: Could the urine estrone-3-glucuronide (E3G) assay be used efficiently to monitor a controlled ovarian hyperstimulation (COH) cycle, in comparison to a serum estradiol (E2) assay?
Summary answer: E3G testing provides an alternative to serum E2 assessment and a new "patient friendly" approach for COH monitoring.
What is known already: In many IVF clinics basic monitoring tools for controlled ovarian stimulation during IVF procedure are ultrasound measurements of follicle growth and hormone assessment of serum E2 levels. The monitoring can occur 4-6 times during stimulation, but repeated blood sampling causes patient stress. In contrast, E3G sampling, one of principal metabolites of estradiol in urine, is non-invasive and can be performed by the patients themselves and measured by fluorescent immunoassay. A correlation has been shown between concentrations of E2 present in plasma and concentrations of E3G in different phases of menstruation cycle.
Study design, size, duration: This is a pilot, prospective study, in a single IVF clinic. Twenty female participants were recruited November 2020 -January 2021, aged 25-43 years and BMI: 18-28kg/m2. Dynamic change of serum E2 and urine E3G at ovarian stimulation monitoring are being analyzed.
Participants/materials, setting, methods: Concurrent urine E3G and serum E2 values were collected from patients who provided between 2 and 4 samples on different days of their COH IVF cycle. Serum E2 values were assessed routinely, while E3G values were measured and validated using a fluorescent immunoassay Mira Fertility Plus® analyzer.Main results and the role of chance: The urine E3G of assay was validated for intra- and inter-assay variability with a coefficient of variation of<20%. It was also validated for analytical and functional sensitivity and sample stability. Linear regression of serum E2 and E3G values of 56 early morning urine samples who had evaluated between Days 4 and 13 of menstruation cycle provided an R=0,81. Urine E3G values also correlated to follicle growth. Patient survey results showed that urine sampling was the preferred method of analysis.
Limitations, reasons for caution: We have provided proof of principle that urine E3G measurement can be accurately carried out using fluorescent immunoassay technology during routine COH for IVF cycles. The patients' study group has to be expanded in order to enable us to find the appropriate place of urine E3G assay in COH protocol.
Wider implications of the findings: Urine E3G testing correlates well to serum E2 assessment in COH. Urine E3G assay provides an alternative to serum-based assessment. The ease of urine sampling allows a reduction in patient discomfort during venopuncture, costs, time, and infection risks in epidemics/pandemics, like COViD-19, and offers a patient-friendly approach to ovarian stimulation.
Trial registration number: NA