EXCRETION OF URINARY GLYCOSAMINOGLYCAN DURING THE NORMAL MENSTRUAL CYCLE OF YOUNG WOMEN

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INTRODUCTION & OBJECTIVES: Glycosaminoglycans (GAG) play an important protective role on the urothelial surface, and changes in urinary GAG excretion have been demonstrated in several female urological diseases, especially interstitial cystitis. However, published data on GAG excretion in this disease are not consistent. This may be due to an eventual variation of GAG excretion during the menstrual cycle, since controls consisted of women at childbearing age. Here we used well-established biochemical techniques and a homogenous study group to assess GAG excretion profile during the menstrual cycle of normal young women.

MATERIAL & METHODS: Urine samples were obtained from 10 medical students not meeting exclusion criteria (irregular menstrual cycles, use of oral contraceptives, urinary infections, history of urolithiasis and diabetes) and aged 19 to 21 years. Each volunteer collected one urine specimen daily during the whole menstrual cycle. Total GAG was isolated from diluted urine by precipitations with cetylpyridinium chloride and ethanol, and was then quantitated as hexuronic acid using a carbazole assay. The urinary concentration of GAG was expressed as μg hexuronic acid per mg creatinine. Proportions of sulfated GAG species were determined by agarose gel electrophoresis.

RESULTS: GAG excretion showed a biphasic pattern, with higher and lower values in the pre- and post-ovulatory periods, respectively. In addition, mean excretion values obtained for the periods between the 4th and 13th (0.445 ± 0.041), and between the 15th and 28th (0.356 ± 0.035) days of the cycle were significantly different (one-way ANOVA, $p<0.001$). Correlation between pre- and post-ovulatory values showed that this difference was consistent irrespective of baseline GAG level excretion ($r=0.9757$, $p<0.001$). There were no significant changes in the proportions of the urinary sulfated GAG during the different phases of the normal menstrual cycle.

CONCLUSIONS: These results indicate a clear variation in urinary GAG excretion during the menstrual cycle. This fact should therefore be taken into account in studies involving urinary GAG excretion in women at childbearing age.