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NOCTURIA AND HORMONE REPLACEMENT THERAPY: DO WE CHANGE THE BLADDER OR THE KIDNEY?

Hypothesis / aims of study
Different hormonal pathways play a role in urine production through their role in water and sodium homeostasis[1]. Changes in the levels of these hormones can thus affect diuresis, and this in turn lower urinary tract symptoms (LUTS). However, there are indications that other hormones such as the sex hormones have an influence in these pathways. For example, several studies have shown a beneficial effect of hormone substitution therapy on the number of nocturnal voids, while others contradict this.[2] The aim of this study is to evaluate changes in diuresis and LUTS in postmenopausal patients, before and after hormonal substitution therapy (HST).

Study design, materials and methods
This prospective observational study was executed between January 2015 and March 2016. Postmenopausal women visiting the were asked to complete a 24hr-frequency volume chart (FVC) and a renal function profile (RFP). This is a 24hr-urine collection in which 8 urine samples are collected with and interval of 3 hours. Sodium and osmolality were measured on each of these samples. Patients were also asked to complete the female version of the ICI questionnaire on LUTS (ICIQ-FLUTS) to assess storage (0 - 15), voiding (0 - 12) and incontinence symptoms (0 - 20), with 0 being no symptoms. Study protocol had to be completed twice, once before start of HST, and after at least 4 weeks of treatment. A blood sample was taken to confirm hormone status, and to measure concentrations of sodium and osmolality, to calculate sodium and free water clearance (FWC). Medians and interquartile ranges are recorded as descriptive statistical parameters. Comparisons within groups were performed using the Wilcoxon signed rank test for two related samples. A p - value <0.05 was considered statistically significant.

Results
A total of 21 participants completed study protocol, with a mean time interval of 52 (42 - 62) days between the two dates. Median age was 53 (51 - 56). Nocturnal voided volume did change significantly after hormone treatment (p=0.134), but number of nocturnal voids did decrease (p=0.033). The characteristics of the FVC are discussed in Table 1. There were few changes on the RFP, but FWC decreased significantly (p=0.006). A comparison before and after HST for diuresis rate, sodium clearance and free water clearance is represented in table 2 and figure 1. Median filling score on the FLUTS was 2 (1 – 4 vs 0,75 – 3) (p=0.154), median voiding score was 1 (0 – 1,75) before and 0 (0 – 1,25) after HST (p = 0.096), and median incontinence score decreased from 3 (1 – 3) to 2 (0 – 2) (p = 0.031) after HST.

Interpretation of results
In our study we could not demonstrate big differences in bladder capacity. This is in contrast to the reduced number of nocturnal voids with a similar nocturnal voided volume. Total voided volume did decrease, but this can be due to a reduction in drinking volume. Diuresis rate decreased during daytime and sodium clearance decreased at night, which might be an effect of the estrogen substitution in the morning, and progesterone substitution in the evening.

Concluding message
These results suggest an effect of HST on both the bladder and the kidney, although the effect on diuresis seems to be more pronounced. This is an early provisional analysis on a small number of patients, from an ongoing study, . Further research is needed to explore the effect of castration and hormonal substitution on diuresis and LUTS.

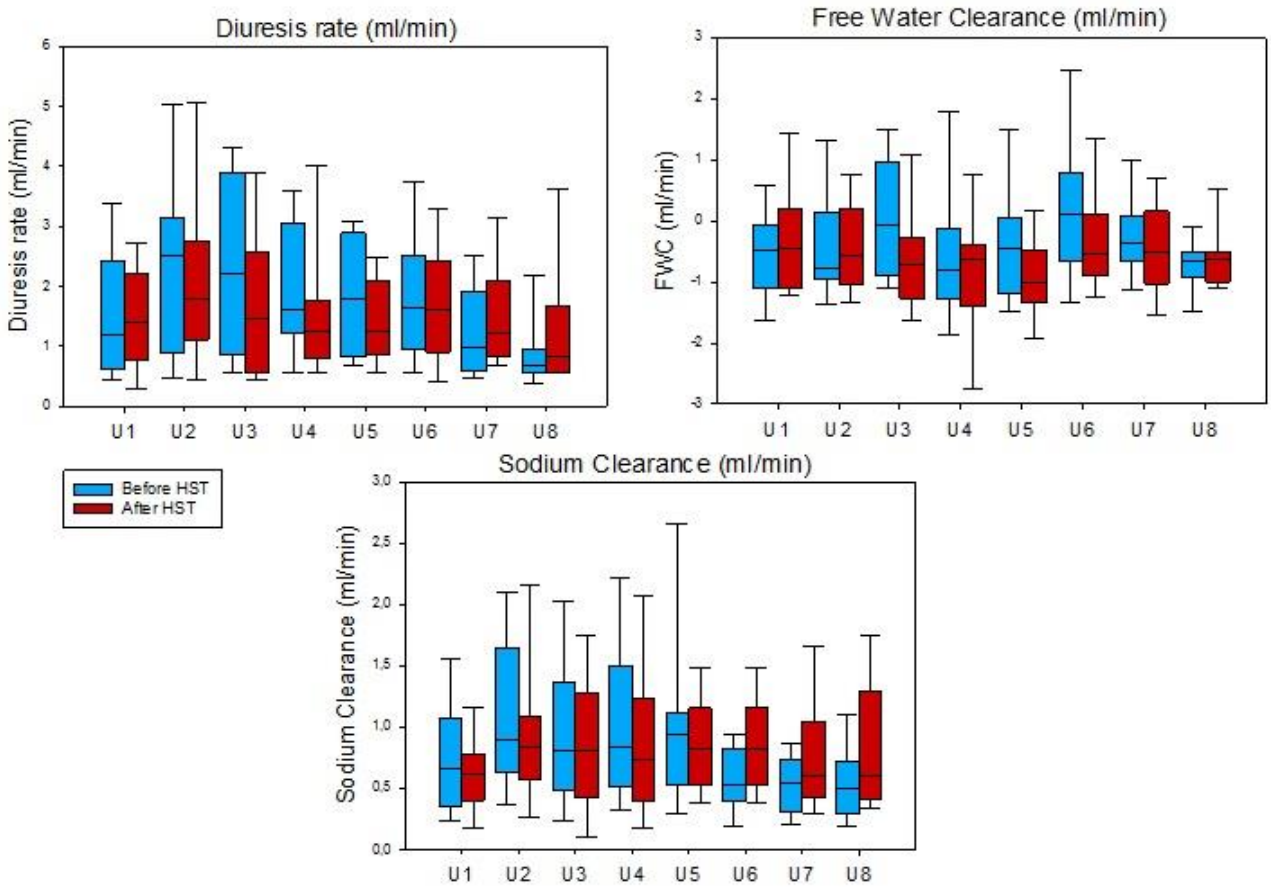
Table 1: FVC characteristics before and after HST

	Before HST	After HST	p-value
Drinking volume (ml)	2225 (1570 – 2557)	1737.5 (1285 – 2176)	0.002
24hr Voided volume (ml)	2112 (1588 – 2315)	1909 (1529 – 2206)	0.033
Nocturnal voided volume (ml)	558.5 (442 – 772)	508 (333 – 770)	0.134
Voiding frequency day (#)	7 (6 – 9)	7 (6 – 8)	0.137
Voiding frequency night (#)	1 (1 – 1)	1 (0 – 1)	0.033
Mean 24hr bladder capacity (ml)	235.5 (195 – 280)	250 (174 – 300)	0.831
Maximum voided volume (ml)	467 (373 – 531)	491 (356 – 585)	0.453

Table 2: Diuresis rate, free water and sodium clearance before and after HST

	Before HST		After HST		p-value	
	Day	Night	Day	Night	Day	Night
Diuresis rate (ml/min)	1.89 (1.43 – 2.35)	1.14 (0.97 – 1.68)	1.58 (1.20 – 2.19)	1.33 (0.94 –1.70)	0.021	0.411
FWC (ml/min)	-0.17 (-0.68 – 0.10)	-0.30 (-0.75 – 0.24)	-0.62 (-0.97 – -0.38)	-0.44 (-0.85 – 0.10)	0.068	0.177
Sodium Clearance (ml/min)	0.83 (0.74 – 1.05)	0.54 (0.38 – 0.70)	0.85 (0.50 – 1.09)	0.64 (0.41 – 1.04)	0.435	0.266

Figure 1: Diuresis rate, free water and sodium clearance before and after HST



References

1. Goessaert AS, Krott L, et al. Diagnosing the pathophysiologic mechanisms of nocturnal polyuria. Eur Urol 2015;67:283-8
2. Stachenfeld NS, DiPietro L, et al. Estrogen influences osmotic secretion of AVP and body water balance in postmenopausal women. Am J Physiol 1998; 274:187-195

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