The testosterone-supplemented SHR combines prostate enlargement, urodynamic impairment characteristic of LUTS and erectile dysfunction.
This model helps to assess new therapeutic strategies for BPH while evaluating their efficacy on bladder dysfunction and prostate enlargement as well as their sexual side-effect profile.

Pathophysiological features

Prostate enlargement

The testosterone-supplemented SHR exhibits several common characteristics with the human pathology:

- Prostatic enlargement (prostate wet weight) (table 1).
- Combined increase in both prostate cell number (DNA content) and size (protein content).
- Both stromal and epithelial proliferation (histomorphometry).

Table 1: Prostate weight, DNA and protein contents in Wistar Kyoto rats (WKY), spontaneously hypertensive rats (SHR) and SHR supplemented with testosterone (SHR-T) after 4 weeks of testosterone supplementation (From Oudot et al., 2012).

	WKY	SHR	SHR-T
Body weight (g)	343 ± 9	304 ± 7**	270 ± 5**§§§
Prostate weight (mg/100 g bodyweight)	174 ± 11	177 ± 10	293 ± 12*** §§§
DNA content (µg/prostate/100 g bodyweight)	247 ± 57	282 ± 39	475 ± 29**§§
Protein content (mg/prostate/100 g bodyweight)	9.95 ± 1.32	7.17 ± 0.73	14.94 ± 1.12**§§§
DNA / Protein content ratio	0.028 ± 0.007	0.039 ± 0.005	0.032 ± 0.002

***P < 0.01, ***P < 0.001 versus WKY, §§P < 0.01, §§§P < 0.001 versus SHR, Newman–Keuls post-test after P < 0.01 one-way analysis of variance.*

Bladder dysfunction

- Exhibits abnormal bladder function: decreased ICI, voided volume, bladder capacity, increased urinary frequency and amplitude of non-voiding contractions characteristic of detrusor overactivity (figure 1).
- Bladder hypertrophy (histomorphometry).

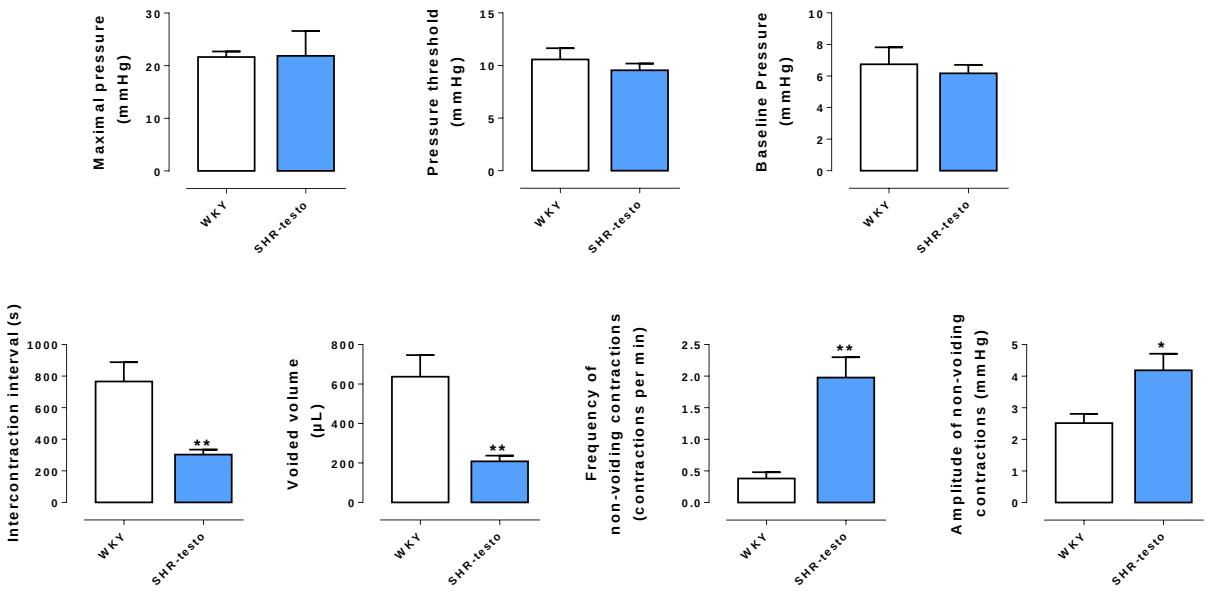

*Figure 1: Urodynamic parameters in WKY and SHR supplemented with testosterone (SHR-testo) measured in conscious rats after a 3-week testosterone supplementation period. *p<0.05, **p<0.01 Student's t-test. (Pelvipharm internal data).*

Erectile dysfunction

- Significant impairment of erectile responses to electrical stimulation of the cavernous nerve in anesthetized SHR supplemented with testosterone (figure 2).

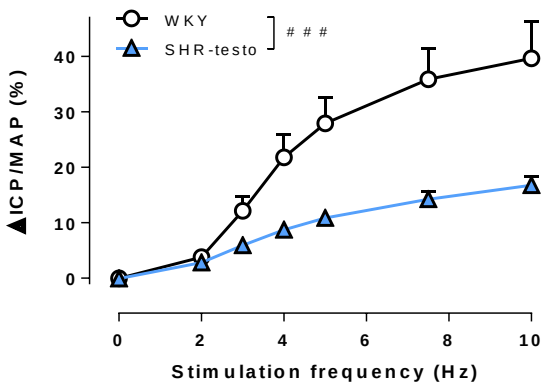

Figure 2: In vivo evidence of erectile dysfunction in testosterone-supplemented SHR. ###p<0.001 two-way ANOVA, compared to age-matched normotensive Wistar-Kyoto (WKY) rats. (From Oudot et al., 2012).

Related Pelvipharm bibliography:

Assaly R *et al.* **BMC Urol** (2020):20;132
Oudot A *et al.* **BJU Int** (2012):110;1352-1358
Oudot A *et al.* **J Urol** (2011):185,4(s1);e631
Oudot A *et al.* **J Sex Med** (2010):7(s6)

NB: Pelvipharm will gladly study the feasibility to fit this experimental model to its client's needs.