981

Low intensity-shockwave therapy (Li-ESWT) delivered by Aries® improves erectile function and decreases cavernosal fibrosis of spontaneously hypertensive rats (SHR)

Eur Urol Suppl 2018 17(2);e981

Giuliano F. [1], Assaly-Kaddoum R. [2], Laurin M. [2], Bernabé J. [2], Behr-Roussel D. [2]

[1]Université Versailles Saint Quentin en Yvelines, Pelvipharm, Dept. of Urology, Montigny-le-Bretonneux, France, [2]Université Versailles Saint Quentin en Yvelines, Pelvipharm, Montigny-le-Bretonneux, France

INTRODUCTION & OBJECTIVES: Li-ESWT has been reported to improve erectile function in patients with moderate or severe ED or even convert phosphodiesterase type 5 inhibitors (PDE5is) non-responders to responders. Hypertension is a risk factor for ED. Erectile function of SHR, a validated rat model of hypertension associated ED, is partially improved by PDE5is. Here, we investigated whether Li-ESWT could affect erectile function with and without acute sildenafil in SHR. A pronounced accumulation of collagen in erectile tissue of SHR has been described, thus we investigated whether Li-ESWT has an effect on the histology of SHR erectile tissue.

MATERIALS & METHODS: 2 groups of SHR (CTRL and ESWT; n=14/group) received treatment sessions 2/week for 6 weeks using a specifically designed water-filled tank. Only in the ESWT group, shockwaves were delivered to the penis at 2 focal zones: mid-shaft and base by an electromagnetic emitter attached to a compact unit (Aries®, Dornier MedTech, Germany). Each session comprised 1000 shocks per focal zone (energy flux density: 0.06 mJ/mm^2, frequency: 6Hz). 4 weeks after the final session, erectile function was assessed by recording intracavernosal pressure (ICP) increase in response to electrical stimulation of the cavernous nerve (ESCN) in absence then in presence of acute sildenafil (0.3mg/kg iv). Then rats were sacrificed, corpora cavernosa harvested and trichrome staining was performed to compute cavernosal smooth muscle (SM)/collagen ratio by a blinded experimenter. Cavernosal micro-vascularization and nNOS positive nerves were assessed by IHC to CD31 and nNOS.

RESULTS: ESWT delivered by Aries® increased erectile responses of SHRs (at 10Hz, ΔICP/MAP: +17%; AUC_{tot}/MAP: +17%, p<0.001 vs.CTRL, ΔICP being the difference between ICP in the flaccid state prior to ESCN and ICP during the plateau phase of the erectile response; MAP, the mean arterial pressure during the plateau phase; AUC_{tot}, the area under the curve during the erectile response). Combining ESWT with sildenafil improved erectile response of SHRs (at 10Hz, AUC_{tot}/MAP: +40%, p<0.001 vs. CTRL) and further enhanced the effect of either therapy (+20%, p<0.01 vs.SHRs treated with ESWT, +16%, p<0.001 vs.SHRs treated with sildenafil). Histological analysis showed a 2.5 fold increase in ratio of SM/collagen (increase in SM and decrease in collagen content) following ESWT.

CONCLUSIONS: ESWT delivered by Aries® improved erectile function in SHR, potentiated the responses to sildenafil. This improvement was accompanied by an increase in the SM/collagen ratio. These results suggest that apart from being an effective mono-therapy for the treatment of ED of vascular origin, ESWT could exert further improve erectile function when combined with PDE5i. This study is the first to report that ESWT both increases cavernosal SM and decreases collagen content in the SHR.