INTRODUCTION

- Urodynamic studies are used to investigate the underlying causes of overactive bladder (OAB), but are invasive and carry a risk of complications such as urinary tract infection.
- Previous studies suggest that BWT, measured using transvaginal ultrasound, is greater in women with OAB or detrusor overactivity than in women with stress urinary incontinence or normal urinary function.
- The use of antimuscarinic therapy for OAB has also been associated with changes in BWT.
- Ultrasound measurement of BWT might therefore be a useful biomarker of OAB or DO and could be used as an outcome measure for treatments of OAB.
- Few studies have explored the link between ultrasound derived BWT and bladder diary variables, such as the frequency of micturitions and incontinence episodes, and the corresponding feeling of urgency.
- The SHRINK study (China/UK joint ID: NCT01031514) investigated the effect of solifenacin on BWT in women with symptoms of OAB and a predefined urodynamic diagnosis of DO.
- This study aimed to determine the relationship between BWT, OAB symptoms and patient satisfaction at baseline and end of treatment.

STUDY DESIGN

SHRINK was a phase 4, randomised, double-blind, placebo-controlled multicentre trial investigating the effect of two doses of solifenacin.

- Following a 2-week placebo run-in period, participants were randomised in a 1:1 ratio to solifenacin 5 mg or solifenacin 10 mg once daily for 12 weeks (Figure 1).

METHODS

- Patients: Eligible patients were women aged ≥18 years with OAB symptoms (urgency, frequency or urgency incontinence) for ≥3 months who had a confirmed urodynamic diagnosis of DO and postvoid residual urine volume ≥30 ml.
- Exclusion criteria included: antimuscarinics or α-blocker treatment within the previous 6 months, history of stress urinary incontinence, pelvic floor dysfunction or urinary tract infection, patients not able to undergo or uninterested in ultrasound, or any condition that would contraindicate participation.

ASSESSMENTS

- Co-primary endpoints were change from baseline to week 12 in bladder ultrasound-measured BWT and normalized urostatic net growth factor (nUCGnet) concentration.
- Change from BWT was assessed by the assessment of images from three measurement locations: anterior, dome and trigone from each visit (baseline, week 6 and week 12) and end of treatment by two blinded central readers, and a mean BWT was derived from the three measurements per subject at each visit.
- Images were assessed by a blinded reader in cases of significant intra-reader and inter-reader variability, samples that could not be scored, or cases in which doubt about various parameters.
- Each visit, patients completed the perception of bladder condition (PPBC) questionnaire, the patient assessment of urgency bother and treatment satisfaction using visual analogue (VAS) scales (UB-VAS and TS-VAS) and the interactive bladder questionnaire (OAB-q). Patients completed a 1-day micturition diary prior to each visit.

RESULTS

- A total of 635 women were screened, 547 (81%) were randomised and 35 randomised patients withdrew from the trial (results not shown).
- The study did not provide conclusive evidence on whether there is a dose effect of solifenacin on BWT.

CONCLUSIONS

- Baseline disease variables including OAB-q symptom severity and BWT significantly correlated with baseline BWT, suggesting that BWT may be an indicator of disease severity.
- All patients, the 10 mg dose group had linear micturition and urgency episodes and lower BWT symptom severity scores compared with the 5 mg dose group, suggesting the group had fewer main OAB symptom variables, which contribute to the lack of a significant treatment effect on BWT after 12 weeks.
- Although results show that treatment with solifenacin can significantly reduce BWT and improve clinical outcomes compared with placebo, correlations between change from baseline in BWT and individual clinical outcome variables were not statistically significant and showed a large variability.

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