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IS THE URODYNAMIC A RELIABLE TEST TO EVALUATE POST VOID URINARY RESIDUAL AND BLADDER CAPACITY IN PATIENT WITH LOWER URINARY TRACT DYSFUNCTION?

Hypothesis / aims of study:
To evaluate if urodynamic (UDS) findings can reproduce the daily post void residual (PVR) and bladder capacity. We design a study to compare UDS urinary residual and cistometric bladder capacity with the void urinary residual obtained by a 3 days voiding diary associated with clean intermittent self-catheterization after void.

Study design, materials and methods:
We evaluate 40 consecutive patients referred to our nurse staff to initiate the intermittent clean self-catheterization (CISC) program. We excluded from this study: patients with psychiatric or cognitive problems with difficult to understand the procedure and those patients with difficult to self – handle the catheter, who did not have a homecare person to help with the procedure. All patients were evaluated by bladder diary with determination of the post void residual (at least 3 times/day) by means of CISC after void or attempt to void. To compare the PVR obtained at the voiding diary, we use the mean of all PVR volume, drained in the 3 days. The average of the 3 days greatest volumes drained and/or voided in 24 hours that was registered in the voiding diary were considered as the bladder capacity. During the UDS, we determined the bladder capacity as usual. The PVR was obtained after free flow (when possible) and after cistometry. To adequately complete the 3 days bladder diary, all patients were training by a specialized nurse to perform a CISC and to understand the diary, registering the intake liquids volume, the urinary frequency and miccional volume. To evaluate the PVR, patients were trained to perform CISC and register the urinary volume drained after void and/or leakage and/or attempted to void.

Results:
Twenty seven patients (11 female and 16 male) with mean age of 46.5±18.5 (range: 22 to 88 years old) had the UDS and voiding diary adequately filled. The indication for CISC was vesico-sphincteric dyssinergia, detrusor hipocontractility or acontractility and bladder outlet bladder obstruction due to BPH with poor clinical conditions to surgery. The mean value for PVR evaluated by the UDS and by the bladder diary was 252.0±169.3 ml (range: 50.5 – 750.5 ml) and 249.2±146.0 ml (range: 34.4 – 553.3), respectively (F =1.087 and p =0.469). Despite of the mean values for the PVR evaluated by UDS and CISC had shown correspondence, when we evaluate the paired correlation (Person's correlation coefficient) between the two measurements, we found a moderate correlation between the two groups (R = 0,503, p = 0.007).
Based on these results, it was randomly performed an ultrasound (USG) PVR evaluation by a third person not involved in the study on 14 patients. We compared USG measurement of the post void residual of these 14 patients with the previous results. The mean PVR determined at the USG was 229.8±80.9 ml (range: 117 – 400 ml). There was not difference between the USG - PVR when it was compared with UDS - PVR (290.4±148.5 ml, F = 0,660 and p = 0,714) and Bladder diary PVR (217.3±146.4 ml F = 5,004 and p = 0,176).
In the same way, the bladder capacity evaluated at the bladder diary and by the UDS did not show any difference. The mean bladder capacity in the bladder diary and in the UDS was 249.2±146.0 ml and 252.0±169.3 ml, respectively (ANOVA – F=1.087 and p = 0.469 – significant equal means at α= 0.05 level).

Interpretation of results:
Overall, the UDS showed good reproduction of the daily findings of bladder capacity and PVR on patients with voiding lower urinary tract symptoms. The PVR evaluation, determined by the UDS, presents similar results as the PVR evaluated by CISC during a 3 days bladder diary. By performing USG with a blind investigator, we also demonstrated that the USG can give a reliable result. The USG can be used as non invasive control for PVR in this population. In the same way, we could demonstrate that the UDS evaluation of PVR can be representative of the daily lower urinary tract behavior. The significant paired correlation between the measurements allow us to state that it is possible to plan the treatment (number of catheterization to avoid high intra vesical pressure and leakage) with good chance of success, based only on the UDS evaluation.

Concluding message:
UDS is a reliable method to determine the PVR and bladder capacity in patients with voiding lower urinary tract dysfunctions. Determination of PVR in these patients is very important on the initial evaluation and to monitor the treatment's goals. The USG is a less invasive and can be correlated to the CISC and UDS. Thus, it should be used as the choice method to monitoring the upper urinary tract and PVR in patients with complex voiding lower urinary tract dysfunctions.

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Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**