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VOLUME OF THE FIRST MORNING VOID AND EFFECT ON RENAL DILATATION IN PATIENTS WITH A NEUROGENIC BLADDER.

Hypothesis / aims of study

We hypothesise that the higher the volume of the first morning void (FMV), the higher the renal dilatation in patients with a neurogenic bladder. The aim of the study was to evaluate the association between the volume of the FMV and the extent to which minor calyces dilate.

Study design, materials and methods

A prospective observational study was carried out between March 2014 and February 2015. Adults with a neurogenic bladder were asked to participate during their hospitalisation/consultation at the department of urology/physical medicine and motor rehabilitation. A renal ultrasound was performed, both before and after their FMV. The width of the minor calyces was measured at 3 different places, both on the left and the right side.

Median and interquartile range was recorded as descriptive statistical parameters. Differences between groups were assessed using the Mann-Whitney U test for nonparametric variables. 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 28 patients were eligible for analysis. Mean age was 46 (32-55) years and 21% (n=6) was female. Spinal cord lesions were cervical in 43% (n=12) of cases and thoracolumbar in 57% (n=16). The ASIA scores were A in 48% (n=12), B in 32% (n=8), C in 8% (n=2) and D in 12% (n=3), and the mean time since the spinal cord lesion was 218 (102-426) days. Micturition occurred via intermittent (self)-catheterisation (64%, n=18), a suprapubic catheter (21%, n=6) or spontaneously (14%, n=4). Mean volume of the FMV at the time of the renal ultrasound was 455ml (320ml-645ml).

The mean width of minor calyces (mm) before and after the FMV are described in table I, both for the left and right kidney and the mean total width. Comparing patients with a FMV lower and higher than 450ml (based on the mean volume of the FMV), showed no difference in width of the minor calyces before or after the FMV, both for the left and the right kidney as well as in total. Figure 1 shows the association between the mean difference (%) in width and the volume of the FMV, with a separation of FMVs higher and lower than 450ml.

Interpretation of results

The mean width of the minor calyces was significantly lower (p<0.001) after the FMV in all individuals, both for the left and right kidney and the mean total width.

Figure 1 illustrates that higher differences in width are seen in smaller FMVs, while higher FMVs show the opposite, with the exception of 3 cases who show high voided volumes and large differences in width. This difference (not significant) may be explained by differences in bladder compliance. Smaller FMVs probably occur more frequently in patients with high pressure bladder, which may lead to a greater renal dilatation with a full bladder.

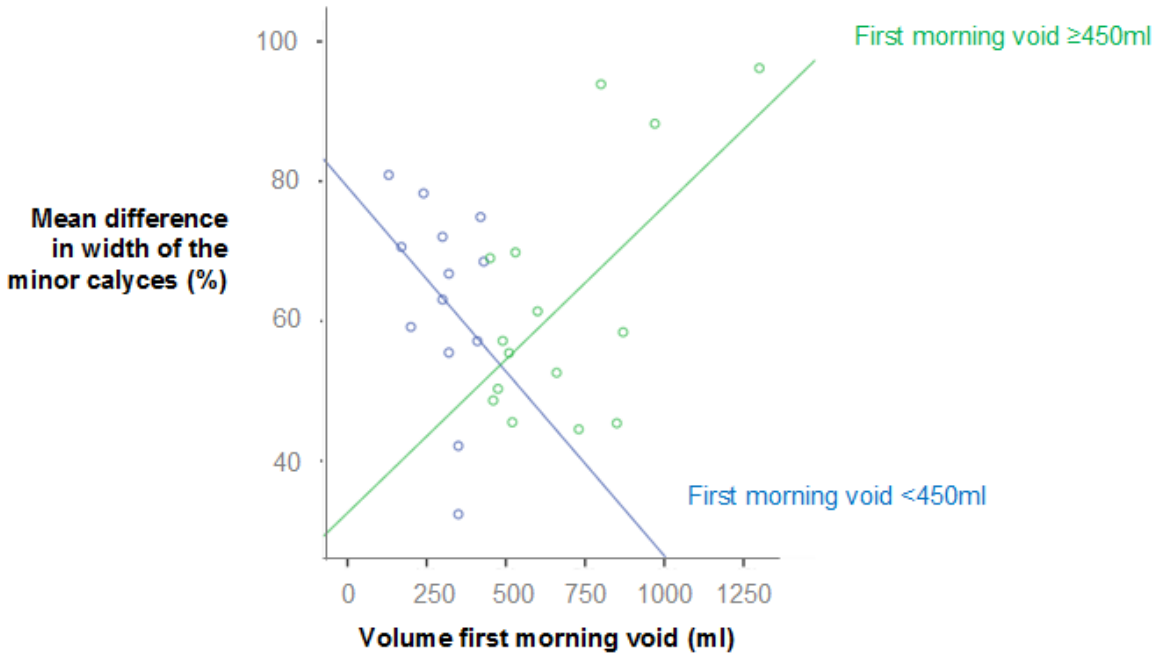
Concluding message

The mean width of the minor calyces is significantly lower after the FMV in patients with a neurogenic bladder. Future research has to assess the effect of bladder compliance, bladder pressure, (nocturnal) polyuria and volume of the FMV on this difference.

Table I: Mean width of the minor calyces (mm)

	Left kidney	**Right kidney**	**Total**
Before FMV			
Overall (n=28)	1.8 (1.3-2.1)	1.6 (1.3-2.6)	1.7 (1.4-2.5)
FMV <450ml (n=13)	1.6 (1.2-2,1)	1.5 (1.2-2.2)	1.6 (1.2-2.1)
FMV ≥450ml (n=15)	1.8 (1.3-2.1)	1.8 (1.5-2.7)	1.9 (1.5-2.6)
After FMV			
Overall (n=28)	1.0 (0.7-1.5)	0.9 (0.7-1.5)	0.9 (0.7-1.6)
FMV <450ml (n=13)	0.9 (0.7-1.4)	0.9 (0.7-1.4)	0.9 (0.7-1.4)
FMV ≥450ml (n=15)	1.0 (0.7-1.9)	0.9 (0.8-1.5)	1.0 (0.7-1.9)
P-value			
Overall (n=28)	**<0.001**	**<0.001**	**<0.001**
FMV <450ml (n=13)	**0.001**	**0.001**	**0.001**
FMV ≥450ml (n=15)	**0.012**	**0.001**	**0.001**

Figure 1: Mean difference (%) in width of the minor calyces before and after the first morning void



Disclosures
Funding: K Everaert: Grant from Astellas, AMS, Allergan, Bard, Coloplast, Ferring, Hollister,Pfizer, Medtronic and Wellspect MA Denys: Research grant from Astellas, AMS, Allergan, Bard, Ferring, Pfizer and Medtronic **Clinical Trial:** Yes **Public Registry:** No **RCT:** No **Subjects:** HUMAN **Ethics Committee:** Ethics committee Ghent University Hospital (EC2014/0256) **Helsinki:** Yes **Informed Consent:** Yes