

POST-VOID RESIDUAL VOLUME INCREASES AFTER PRESSURE-FLOW IN DIABETIC PATIENTS

Hypothesis / aims of study

Diabetic bladder dysfunction (cystopathy) is characterized as bladder paresis and reduced bladder sensation. Post-void residual (PVR) measurement is a feasible way to assume voiding efficiency, which comprises bladder paresis and outlet obstruction. PVR measurement is usually performed twice; after free-flow (with an intermediate bladder volume), and after pressure-flow (with a full bladder and a transurethral catheter *in situ*). Although the difference is not significant in normal subjects, in neurological patients the difference can become significant. The aim of the present study is to measure PVR under two conditions in patients with diabetes, a common neurologic disorder.

Study design, materials and methods

We measured PVR in 31 diabetic patients: 19 men (DM), 12 women (DF), and 48 urodynamically-normal control subjects (both storage and voiding phases): 21 men (NM), 27 women (NF). We excluded prostatic hypertrophy since it might affect the volume of PVR. Free-flow and pressure-flow (using 8F transurethral catheter *in situ*) were performed according to the standards by International continence Society. Free-flow PVR was measured by transurethral catheterization. Pressure-flow PVR was measured by transurethral catheterization that was placed for use of pressure-flow.

Results

The mean PVR volume after free flow was 10.8ml (NM), 7.5ml (NW), 87.6ml (DM), and 42.3ml (DW), respectively. The mean PVR volume after pressure flow was 28.1ml (NM), 15.4ml (NW), 258.2ml (DM), and 234.4ml (DW), respectively. PVR volumes in diabetics after pressure flow was significantly larger than those after free flow (DM $p=0.001$, DF $p=0.01$). In contrast, there was no significant difference between PVR of free-flow and pressure-flow in control subjects (**Figure 1**).

Interpretation of results

After pressure-flow in which subjects had a full bladder and a transurethral catheter was placed *in situ*, voiding efficiency is decreased, which has been well described previously in prostate hypertrophy and in women. However, no such data have been available in neurological patients. In light of the results of the present study, neurological (mostly detrusor) disorder can also affect voiding efficiency in pressure-flow. In other words, in diabetes, we should check PVR not only after pressure-flow, but also free-flow.

Concluding message

In diabetic patients, PVR volume becomes larger after pressure-flow as compared with that after free-flow.

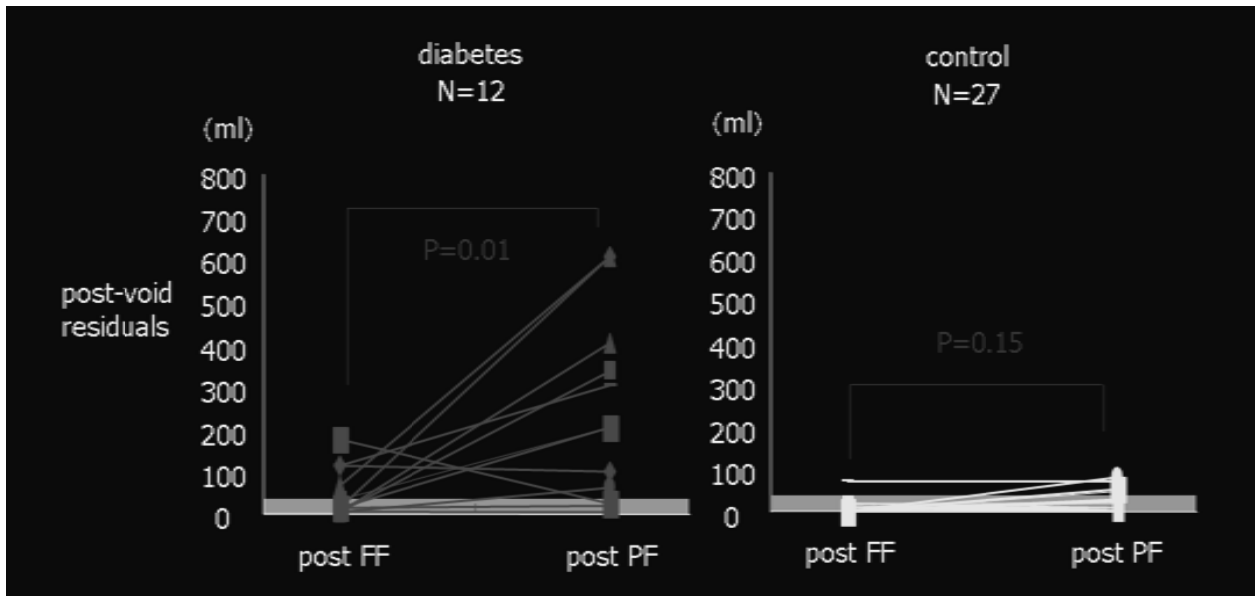


Figure 1

Post-void residuals after free-flow (FF, without a catheter) and after pressure-flow (PF, with a catheter *in situ*): female diabetics.

(Left) In diabetic patients, post-void residuals after PF was significantly larger than those after FF ($p=0.01$). (Right) In control subjects the difference was not statistically significant.

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HUMAN SUBJECTS: This study was approved by the Ethics Committee in Chiba University and followed the Declaration of Helsinki Informed consent was obtained from the patients.