

## **ACCURACY OF RESIDUAL URINE VOLUME MEASUREMENT: COMPARISON BETWEEN TWO PORTABLE ULTRASOUND SCANNERS AND CATHETERIZATION**

### **Hypothesis / aims of study**

Ultrasound-measured urine volume has been developed as a convenient non-invasive method of measuring bladder volume, primarily postvoid urine residual (PVR), to be used as an alternative to in-and-out catheterization. We assessed the relative accuracies of a new portable ultrasound unit (BME-150A, S & D Medicare Co. Korea) and BladderScan™ BVI 3000 (Diagnostic Ultrasound Co, US) in comparison with true residual urine volumes.

### **Study design, materials and methods**

Using these machines, we started prospectively measuring residual urine in 89 patients undergoing urodynamic study. Ultrasound measurements were compared to post-scan bladder volumes obtained by catheterization in the same patients. The ultrasound was followed immediately (within 3 minutes) by in-and-out catheterization while the patient was in the supine position. Student's t-test, reliability analysis (interclass correlation coefficient), regression analysis were performed.

### **Results**

Total 116 measurements were done on 40 men and 49 women between the ages of 5 and 94 years, with a mean of 57.9. The weight ranged between 16 and 80 kg, mean 60. The height ranged between 108 and 175 cm, mean 159. Body mass index (BMI) ranged from 14 to 29, mean 24. The first ultrasound unit (BME-150A) showed correlation with residual volumes of 0.89 and a mean difference from the true residual volume of 5.1 ml. The second ultrasound unit (BladderScan™ BVI 3000) showed correlation with residual volumes of 0.94 and a mean difference from the true residual volume of 1.7 ml. Correlation analysis showed that the difference between two models was not significant ( $p=0.2421$ ). There were 6 cases in which follow-up of falsely elevated PVR measurement on ultrasound resulted in comparatively low catheterized volumes showing a difference of 80-237 ml. They were diagnosed as ovarian cyst, uterine myoma, uterine adenomyosis by pelvic ultrasonography.

### **Interpretation of results**

Portable ultrasound scanners are quick, easy to use, and accurate for determining bladder urine volume. The accuracy of BME-150A is as good as BladderScan™ BVI 3000 in estimating true residual volume.

### **Concluding message**

Compared to BladderScan™ BVI 3000, BME-150A correlated well with the actual residual volume and is sufficient to recommend its use as alternative to catheterization.



BME-150A (S & D Medicare Co.)

