

## ACCURACY OF BLADDER VOLUME DETERMINATION USING A NEW PORTABLE HANDHELD ULTRASOUND BLADDER SCANNER: A PROSPECTIVE STUDY OF 34 CONSECUTIVE INPATIENTS.

### Hypothesis / aims of study

The aim of this study was to exam the accuracy of a new portable handheld ultrasound bladder scanner for measuring bladder volume.

### Study design, materials and methods

A portable handheld ultrasound bladder scanner, Liliium®  $\alpha$ -200 (Lilium Otsuka Co., Ltd., Kanagawa, Japan. Weight: 150g (excluding batteries). Size: H 120mm x W 68mm x D 27mm), has been introduced to measure bladder volume (Figure 1).

Consecutive inpatients with voiding problems after removal of indwelling urethral catheter and needing clean intermittent catheterization (CIC) were included in this prospective study. Recruitment was conducted in convalescent rehabilitation or long-term care wards at a single hospital between April 2016 and March 2017.

Patients' bladder volumes were measured by generalist ward nurses (not urology specialist nurses) using the Liliium®  $\alpha$ -200 scanner, before CIC. Evaluations were made with patients in the supine position. Pearson's correlation was used to compare bladder volume measured by Liliium®  $\alpha$ -200 with by volume measured at CIC.

### Results

We collected data from 34 inpatients (10 males and 24 females. Mean age was 81.7 years), with in total 123 separate examinations of bladder volume (1-20 examinations / patient). A correlation coefficient of  $r = 0.74$  was found between Liliium®  $\alpha$ -200 and CIC (Figure 2). The mean differences between the two was -10.5mL, with the corresponding 95% confidence interval (-174.9, 153.8) (Figure 3).

### Interpretation of results

This was a first clinical study to evaluate the accuracy of a new portable handheld ultrasound bladder scanner, Liliium®  $\alpha$ -200, for measuring bladder volume.

### Concluding message

A new portable handheld bladder scanner, Liliium®  $\alpha$ -200, is applicable with good accuracy.



Figure 1. A new portable handheld bladder scanner, Liliium®  $\alpha$ -200.

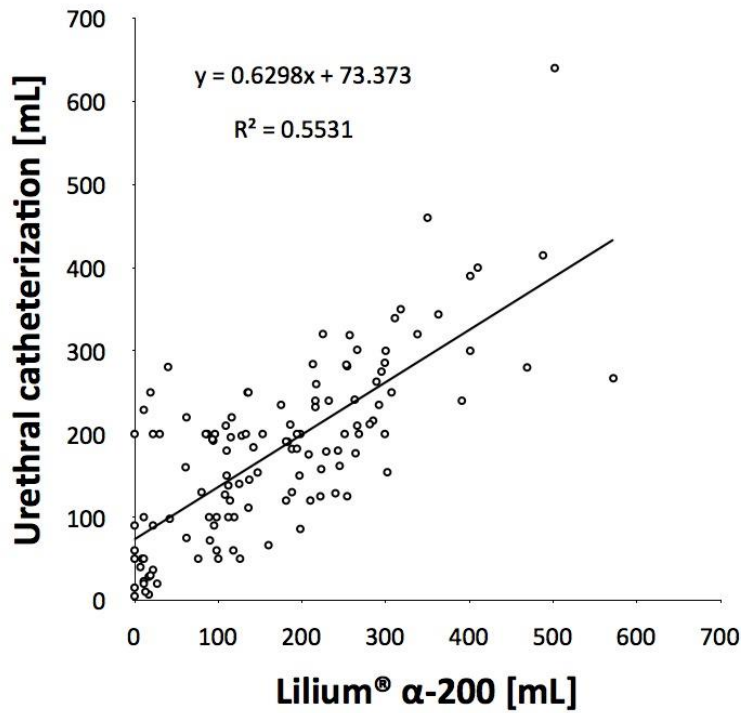


Figure 2. The linear regression analysis of the correlation between Lilium® α-200 evaluation and the catheterization (n=123).

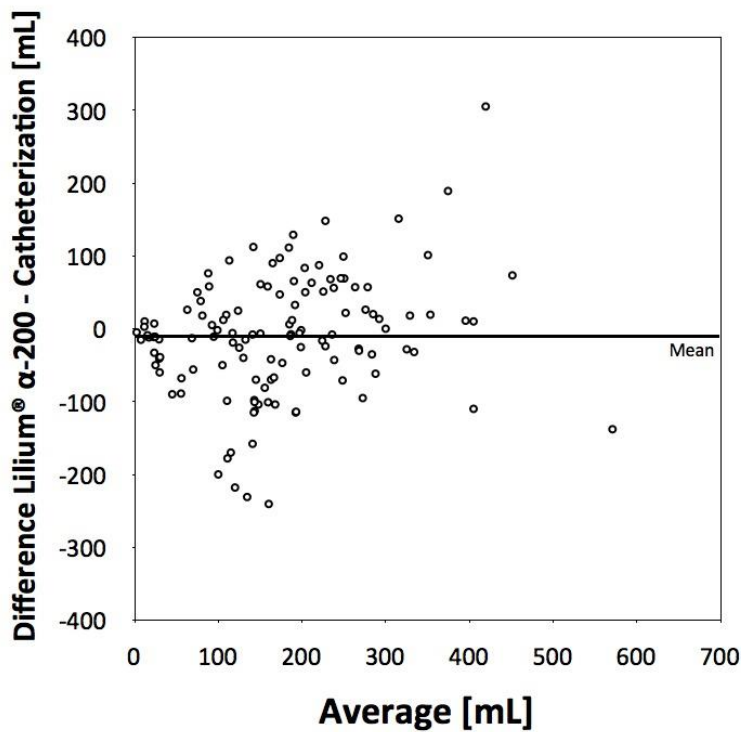


Figure 3. The differences in volume between Lilium® α-200 and catheterization are plotted against the average of the two (Bland-Altman plot).

Disclosures

**Funding:** NONE **Clinical Trial:** No **Subjects:** HUMAN **Ethics Committee:** Ethics Committee of Jujin-Kai Kimura Hospital **Helsinki:** Yes **Informed Consent:** Yes