

## **SOCIOECONOMICAL EFFECT OF BLADDER FUNCTIONAL ASSESSMENT-BASED OPTIMAL PROMPTED VOIDING CARE FOR INSTITUTIONALIZED ELDERLY WITH URINARY INCONTINENCE IN JAPAN**

### Hypothesis / aims of study

The proportion of elderly people (aged 65 and more) in the Japanese population has been rapidly increasing and is estimated to be above 25% by the year 2015 [1]. It was an iconic moment that market size of absorbent products for elderly incontinence surpassed those for baby by the year 2010. Nowadays, the market size is close to 180 billion Yen (equal to 1.5 billion Euro: current rate, 1 Euro = 120 Yen). In Japan, incidence of urinary incontinence (UI) among elderly living in nursing homes is approximately 50% [2]. Prompted voiding (PV) is scheduling regimen often applied to support those institutionalized elderly with UI. Elderly is asked at regular intervals if he or she has a desire to void. However, for elderly who cannot express desire to void, PV cannot work effectively and result in increasing caregivers' burden. Recently, we developed a new method of personalized voiding support care named 'Ultrasound-guided PV (UPV)', where voiding is prompted on the basis of optimal bladder volume for each individual. In this study, we evaluated the efficacy of UPV for frail elderly with UI living in nursing homes. Caregivers' quality of life (QOL) was also evaluated.

### Study design, materials and methods

Since November 2011 to December 2012, we performed the present study. We recruited 96 Japanese frail elderly with UI from six nursing homes. Prior to the study, all participants had been cared by PV or timed voiding method as a usual care. At first, we recorded the bladder diary for wetness episodes, voided volume of urine, and residual urine volume for a few days. Residual urine volume was measured by an ultrasound device (BladderScan<sup>®</sup> BVI 6100, Verathon Inc., Bothell, WA). Based on the diary records, the mean bladder capacity at voiding (voided urine volume + residual urine volume) was regarded as the optimal bladder volume for the individual to pass urine. The subjects underwent ultrasound test for bladder volume every 1 to 2 hours, and were prompted to go to toilet regardless of his or her desire to void, when the ultrasound-estimated bladder volume was equivalent to the individual optimal bladder volume. The bladder function was classified into fair group (the mean residual urine volume < 100 mL and the mean voided volume ≥ 100 mL) and poor group (the mean residual urine volume ≥ 100 mL or the mean voided volume < 100 mL; however; we prompted all participants to toilet by each of optimal voiding interval without discrimination of voiding function. Efficacy of UPV was evaluated as change in cost of continence aids. The costs were evaluated at baseline, 4-week, 8-week, and 12-week after the intervention. Caregivers' quality of life was measured by the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36v2<sup>™</sup>) [3]. The paired t-test was used for the statistical analysis.

### Results

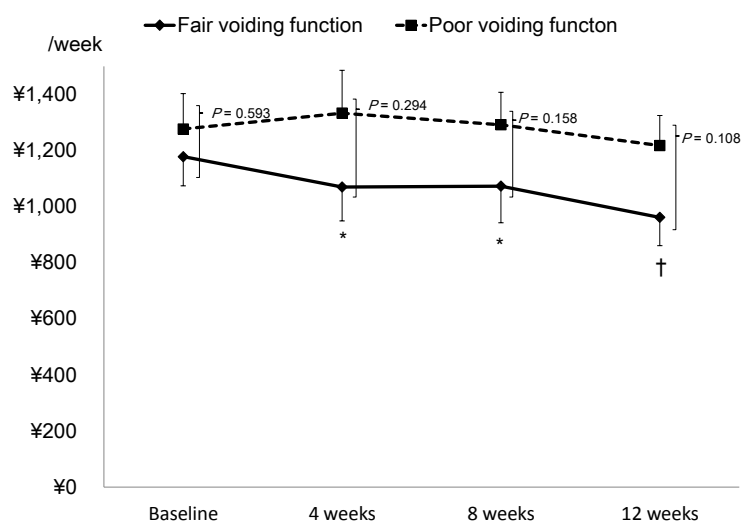
Excluding six with insufficient data, remaining 88 elderly subjects were used for analysis. Of six elderly, two died of pneumonia and four were transferred to other hospitals due to worsening of health conditions. According to the evaluation of voiding function, 44 were classified into fair group and remaining 44 into poor group, respectively. Gender ratio and the Care-Needs Levels were not different between groups. Distribution of age in the fair group was significantly younger than that of poor group (mean ± SD, 82.2 ± 9.2 vs. 86.2 ± 7.3 yrs; Kruskal-Wallis,  $P = 0.040$ ). After 12-week intervention, cost of continence aids decreased in 26 (59.1%) of fair group and 22 (50.0%) of poor group, respectively. Only three elderly were free from any continence aids (two from fair group and one from poor group). As shown in figure 1, the mean costs of continence aids in fair group were significantly decreased in a time dependent manner; however, no inter-group differences were observed. At one facility, annual cost of whole amount of continence aids was reduced 5.4 million Yen (equal to 45,000 Euro per year at pre-intervention) in 2011 to 4.7 million Yen (equal to 39,000 Euro per year at post-intervention) in 2012. Forty-one caregivers answered for SF-36 at baseline; however, four of them were retired. As shown in Table 1, scores in bodily pain and mental health were significantly improved after the intervention.

### Interpretation of results

The cost of continence aids significantly decreased in the group of elderly with fair voiding function. Larger numbers of elderly with UI were needed to demonstrate inter-group difference of cost effectiveness. Caregivers' QOL was partially improved after the intervention.

### Concluding message

In the future, a large-scale with long follow-up study evaluated by generalized measures, such as Mini-Mental Scale Examination for cognitive function, Barthel Index for activity of daily living of elderly, Zarit Burden Scale for caregivers' burden should be warranted to generalize the efficacy of UPV in the meanings of elderly's general function as well as cost-effectiveness of continence aids and caregivers' burden.



\*  $P < 0.05$ , †  $P < 0.001$  (vs baseline)

Figure 1. Chronological changes in costs of continence aids.

Subscale	n	Before (Mean ± SD)	After (Mean ± SD)	Pvalue
Physical functioning	38	88.0 ± 13.4	87.8 ± 15.1	0.892
Role physical	35	84.9 ± 18.1	88.0 ± 13.9	0.378
Bodily pain	35	58.9 ± 23.0	69.0 ± 17.7	0.034
General health perceptions	34	59.9 ± 16.0	60.8 ± 18.8	0.937
Vitality	34	50.6 ± 17.4	58.7 ± 17.7	0.057
Social functioning	38	79.0 ± 20.4	83.9 ± 22.3	0.289
Role emotional	35	80.5 ± 18.7	87.4 ± 16.6	0.132
Mental health	34	60.5 ± 20.6	68.2 ± 15.5	0.007

Table 1. Caregivers' QOL: changes in subscales of SF-36.

#### References

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#### Disclosures

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