Impaired Mobility and Urinary Incontinence in Nursing Care: A Multicentre Study in Nursing Homes

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Introduction

The prevalence of mobility limitations increases with age, and as the population ages, impaired mobility in the elderly and conditions associated with it such as urinary incontinence (UI) will be an even more significant public health issue (1). While research linking any impairment in mobility to UI is extensive, we found relatively few studies evaluating the link between reduced mobility status according to the Elderly Mobility Scale (EMS) and UI in nursing home patients (2). In the context of the nursing home, the definition of the term mobility is based on concepts of care dependency. Mobility is defined as the physical ability to move independently over short distances (with walking aids if necessary) and to carry out autonomous changes in body position. Considering the development of correlated diseases such as frailty and fractures, reduced mobility influences the severity of UI in the elderly population. The purpose of this study was to measure associations among use of walking aids, level of mobility and UI in geriatric nursing home residents, and to examine associations between UI severity (frequency and amount) and its impact on health related QoL.

Methods and Materials

In 2014 and 2015 two multicenter descriptive cross-sectional prevalence studies were conducted in nursing homes in all 16 federal states of Germany. These prevalence studies are performed annually by the Department of Geriatric Medicine at the Charité – Universitätsmedizin Berlin (3). Once a year, nursing homes and hospitals throughout Germany are asked to participate in the surveys. All items in the questionnaire were collected via patient interview by nurse data collectors trained by the site coordinator. Items addressing care dependency, mobility, UI, and health related QoL were measured as follows:
Care dependency was measured by using the Care Dependency Scale (CDS) ranging from 15 (completely care dependent) to 75 points (completely independent), and compromising 15 items: eating and drinking, continence, body posture, mobility, day/night pattern, getting dressed and undressed, body temperature, hygiene, avoidance of danger, communications, contact with others, sense of rules and values, daily activities, recreational activities, and learning ability. Recommended cut-off score: ≤68 points.
The **level of mobility** was measured using the Elderly Mobility Scale (EMS). The EMS is a 7-item validated tool designed to assess of mobility in frail elders. Items use an ordinal scale to measure assistance required to move from: 1) lying to sitting position, 2) sitting to lying position, and 3) sitting to standing position. The EMS also assesses assistance needed during walking, timed required to walk 6 meters; and functional reach. Total scores ranged from 0 to 20 with higher scores representing a higher level of independence in relation to mobility. In addition, nurse data collectors were asked if the patient used a wheelchair or walking aids (i.e., cane, walker or wheeled walker).
Urinary incontinence was measured by using the International Consultation of Incontinence Questionnaire Short Form (ICIQ-SF) in order to record presence and severity of UI, and its impact on **health related quality of life** (QoL). The ICIQ-SF is a 4-item questionnaire that asks how often urinary leakage occurs (possible score: 0-5), how much the individual usually leaks (possible score: 0-6), and how much urinary leakage interferes with daily life (possible score: 0-10). The fourth item asks when leaking occurs. The first three items (frequency of leaking, amount of leakage, and the impact on QoL (scored from 0 to 10 with higher scores indicating greater impact) are summed to yield an overall score. The cumulative score ranges from 0 to 21, with higher values indicating more severe forms of UI.

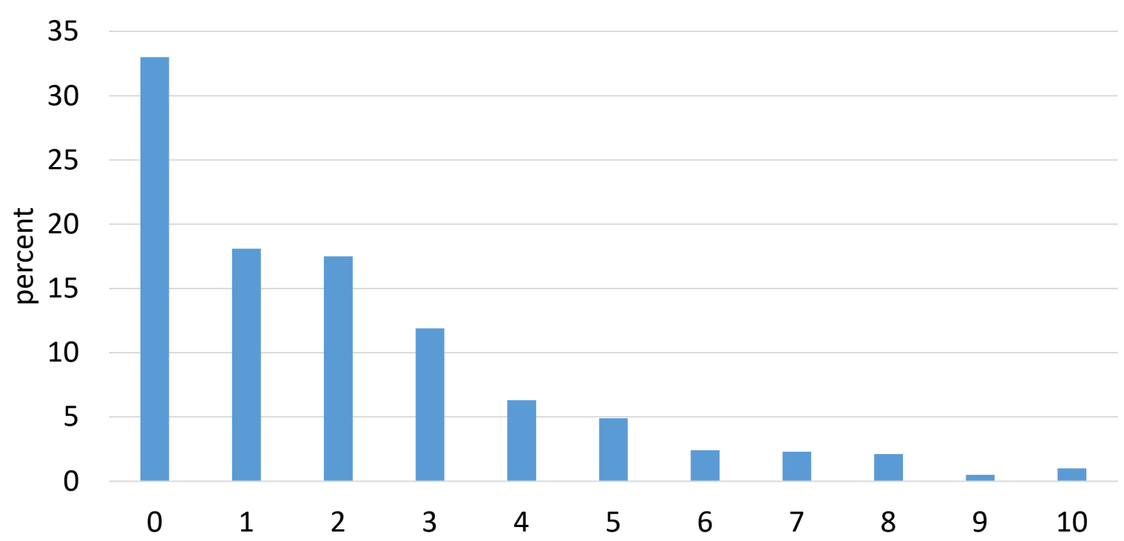

Figure 1. Overall impact on QoL, if UI is present (n=1292)

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Results

Two thousand forty four patients from nursing homes were included in the study. Regarding gender, most were women, 72.0% (total n=1951); the mean age of n=2025 residents was 82.1 years (SD 11.2); mean BMI of n=1988 was 26.1 (SD 5.4); and the mean CDS score of n=1906 was 46.0 (SD 18.2) indicating a medium to high care dependency.

Health Related QoL and UI

The overall impact of UI on QoL was evaluated in 1292 urinary incontinent participants, for which the level of impact has been indicated on a scale from 0 (no impact) to 10 (high impact) (Fig. 1). Most reported a rather small impact: 33.0% (n=427) “zero”, 18.1% (n=234) “1” and 17.5% (n=226) “2”, while a high impact on QoL was only reported by 3.6% (n=46) (2.1% (n=27) “8”, 0.5% (n=6) “9” and 1% (n=13) “10”). Analysis of variance (ANOVA) showed that if a high frequency occurred with a large amount of urinary leakage, the impact on QoL was high (mean 2.2).

Bivariate Association between mobility and UI

The highest prevalence of 61.2% of UI was in patients who did not use any walking aids.

Multivariate CHAID Analysis regarding UI

The results of patients with UI (yes/no) per item and category according to the EMS are displayed in the multivariate classification tree in Fig. 2, controlled for care dependency. The overall prevalence was 69.7%. Of the seven EMS items, completed by two walking aid items, that were entered in Chi-square Automatic Interaction Detector (CHAID) analysis, three EMS items and the two walking aid items were selected by the CHAID routine for the classification tree for UI. Tree analysis in Fig. 2 shows on the first level, that the strongest predictor for UI was “sit to stand”. On the second level the strongest predictors were “sitting to lying” and “wheelchair”. On the third and final level “stand” and “walking aid stick, frame, rollator” were the strongest predictors. A total of 11 nodes could be detected. Of these, 11 final nodes were calculated, which stand for 11 statistically significant different levels of mobility in geriatric residents and patients regarding UI risk characteristics. Fig. 2 shows that the higher the use of wheelchair and walking aids by (partly) immobile patients, the lower the risk for UI.

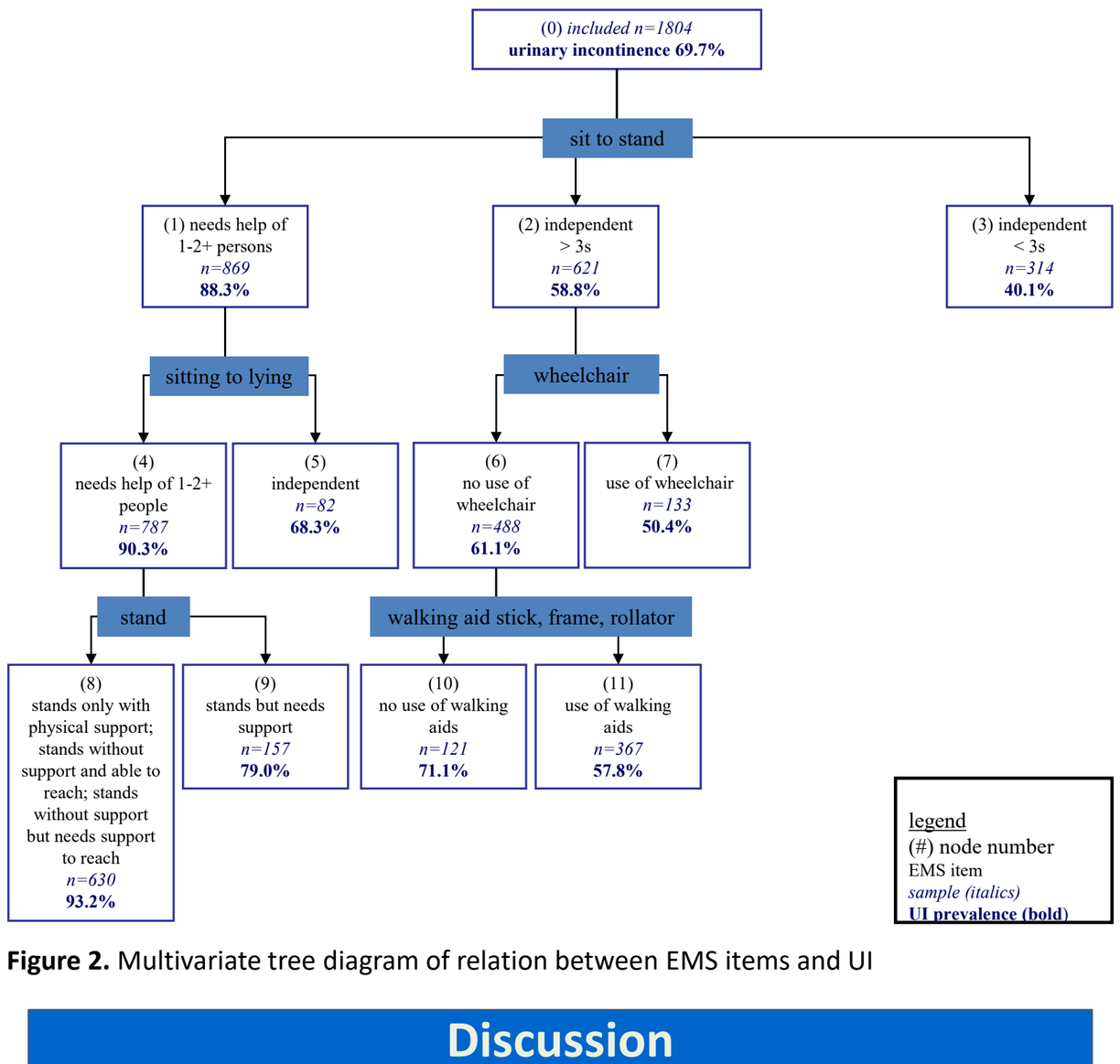

Figure 2. Multivariate tree diagram of relation between EMS items and UI

Discussion

Results of our multi-center descriptive cross-sectional prevalence study indicate that UI occurs in 69.7% of all patients in German nursing homes. The bivariate analysis of the overall impact of the frequency and amount of UI on health related QoL in this study indicates a low impact of UI occurring once a week or less, and a medium impact of occurrences of 2–7 times a week. The level of mobility according to the EMS scores in our study indicated that approximately one in four nursing home patients was unable to stand and walk independently. The bivariate analysis of the level of mobility and diagnosis of UI supports the strong associations between mobility and UI reported by others. Findings from this study suggest that interventions to maintain or improve mobility in nursing home patients may alleviate the frequency and severity of UI. In addition to a recommended subsequent use of walking aids for residents with a reduced mobility status, the chance is, that ongoing research on technical assisted living systems, e.g. wearable monitoring technologies might support the level of mobility for nursing home residents and patients in the near future.

Conclusions

We analyzed data in 2044 adults cared for in nursing homes in Germany and found high prevalence rates of UI and impaired mobility. We also found an association between UI and mobility based on EMS scores. Therefore, we recommend interventions to preserve or regaining residents’ mobility in order to minimize UI.