

Validity of the STRATIFY risk score of falls in nursing homes

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Available online 17 November 2005

Abstract

Objective. We investigated the performance of the STRATIFY risk assessment for fall risk in nursing home patients.

Methods. This prospective study was conducted at the nursing home Antonius Binnenweg in Rotterdam from June 1 to December 31, 2000. Subjects included newly admitted patients of whom a STRATIFY score was obtained. Patients were followed for falls during a person-week observation period of 13 weeks. Measurements were age, sex, admission category, STRATIFY score, length of stay and number of falls.

Results. Of 120 patients (75 women, 45 men, average age 74.5 years), a STRATIFY score was available. Three months after admission 24 of these patients (20%) had died, 56 patients (47%) had been discharged and 40 (33%) still resided in the nursing home. Of the 120 patients included, 36 patients (30%) had fallen during the observation period. The risk of falling in the patient group with a STRATIFY score of 2 or more was 2.35 (95% confidence interval: 1.22, 4.52) times that of patients with a lower score. The sensitivity of the STRATIFY score was 50% (95% CI: 32, 67), specificity was 76.2% (95% CI: 65, 87.5).

Conclusion. The STRATIFY risk score of falls gave disappointing results in our setting.

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Keywords: Risk assessment; Accidental falls; Nursing homes

Introduction

Falls are common among older persons. The incidence of falls increases with increased functional dependence and institutionalization (Tromp et al., 2001; Graafmans et al., 1996). For geriatric hospital inpatients, the STRATIFY risk assessment tool, St Thomas's risk assessment tool in falling elderly inpatients (Oliver et al., 1997), see Table 1, is available. The recent guideline 'Prevention of falls in the elderly' of the Dutch Institute for Healthcare Improvement (CBO) recommends that this tool be used in the hospital setting. However, for nursing homes, no assessment instrument was found suitable (De Kinkelder and Dierckx, 2001). In this study, we used the STRATIFY at the nursing home Antonius Binnenweg, to

identify who will fall before discharge from the nursing home or death or before the end of the observation time at 3 months admission. The nursing home consists of 296 beds and has specialized units for stroke rehabilitation, orthopedic rehabilitation, short-term psychogeriatric admissions and palliative care.

Methods

The study was done from June 1 to December 31, 2000. All consecutively admitted patients of whom a STRATIFY score was obtained were included in the study during a 4-month enrollment period from June 1 to September 30, 2000. The assignment of the items of the STRATIFY was done by the primary nurse of a unit during the second week of admission and was supervised by one of the authors (JW). The first part of the STRATIFY was obtaining information in regard to the history of the patient. If the person fell before, while in a hospital or before the admittance to a previous hospital, a score of 1 was assigned on item 1. With regard to the non-standardized 2nd–4th questions of the STRATIFY, the procedure of 'What do you think...?' was emphasized and no further explanation was given. The last part of the STRATIFY required observation of the patient in a functional situation, and this might be considered common practice in the Dutch nursing homes. The range of the STRATIFY score is 0–5, according to the number of positive answers on the five questions of the STRATIFY. The authors of the STRATIFY (Oliver et al., 1997) identified

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Table 1

STRATIFY risk assessment tool [3]

1. Did the patient present to hospital with a fall (Yes = 1, No = 0)
or has he or she fallen on the ward since admission?

Do you think the patient is:

2. Agitated? (Yes = 1, No = 0)
3. Visually impaired to the extent that everyday function is affected? (Yes = 1, No = 0)
4. In need of especially frequent toileting? (Yes = 1, No = 0)
5. Transfer and mobility score of 3 or 4?^a (Yes = 1, No = 0)
Total score (0–5)

The authors of the STRATIFY chose an appropriate ‘cut-off’ score that defines risk of falling: total score <2: non-falls. Total score ≥2: falls.

^a The transfer and mobility score (range 0–6) is obtained by adding the transfer and mobility items of the Barthel index (each 0–3). Transfer score: 0 = unable, 1 = major help needed (one or two people, physical aids), 2 = minor help (verbal or physical), 3 = independent. Mobility score: 0 = immobile, 1 = independent with aid of wheelchair, 2 = walks with help of one person, 3 = independent. Yes = 1 (transfer and mobility score of 3 or 4). No = 0 (transfer and mobility score of 0, 1, 2, 5 or 6).

a score ≥2 as the appropriate ‘cut-off’ score for increased risk of falling, in their study findings.

Falls were defined as sudden events at which a patient unintentionally reaches the ground or consequently is found on the ground. Falls that occurred after the admission date but before the STRATIFY assessment date were also included. The occurrence of falls was registered for 3 months after admission or until death or discharge, making use of the existing system with the Dutch acronym MIP. The MIP form is a standardized form in which nursing staff can report fall incidents of patients. In addition to the MIP forms, reports of the nursing staff on night and weekend duty were used.

The extent to which falls were predicted was measured for the following variables: age, sex, admission category, scores on the five questions of the STRATIFY and the total score. The ‘admission category’ refers to the type of care the patient would receive: chronically ill (somatic diseases), rehabilitation (after surgery or post-stroke), psychogeriatric (dementias) or palliative care, corresponding with the unit at which the patient was admitted.

Statistical analysis

Because of the differences in observation time, the Cox proportional Hazard model was used. Furthermore, risk of falling was considered to be an intrinsic risk ‘even’ if the patient had not yet fallen; and falls may occur at variable lengths of time after admission. The extent to which a factor, for example, the STRATIFY score predicted falling (≥1 fall during admission) was expressed in the Hazard rate ratio (HRR) calculated in separate Cox proportional Hazard models. We determined the sensitivity and specificity of the STRATIFY score ≥2 in predicting falling during admission from the portions of fallers and non-fallers correctly identified.

Results

During the inclusion period, for 120 patients, 75 women (62%) and 45 men, a STRATIFY score was available, and these patients were followed for falls during a person-week observation period of 13 weeks (3 months). The average age of these patients was 74.5 years. Twenty-seven patients were younger than 65 (22.5%) and 23 patients older than 85 (19%). Of 23 non-included patients, no STRATIFY score was obtained because of logistic problems (3), death (15) or discharge (5 patients) prior to completion of the score. Of the 120 included patients, 36 patients (30%) experienced one or more falls during follow-up, of whom 15 (12.5%) experienced two or

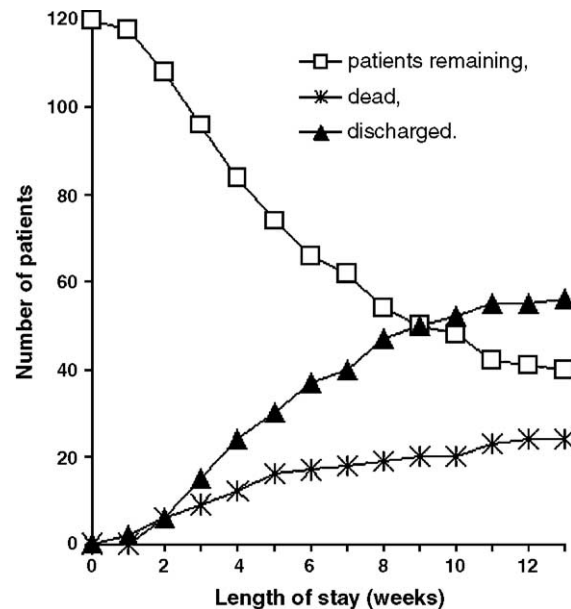


Fig. 1. Follow-up time in weeks of ($n = 120$) patients after their admission date. Nursing home Antonius Binnenweg, Rotterdam, June 1, to December 31, 2000.

more falls. End-points of observation were death, discharge or 3-month follow-up after the admission date. The person-week amount of follow-up time is given in Fig. 1. Twenty-four patients died, mean 4 weeks and 2 days after admission, of whom 3 fell (12.5%); 56 patients were discharged, mean after 4 weeks and 4 days, of whom 14 fell (25%) during admission; 40 patients staid in the nursing home after 3-month admission, of whom 19 patients fell (47.5%).

The distribution of fallers in relation to the STRATIFY score is given in Fig. 2. For the different types of admission (chronically ill, rehabilitation, psychogeriatric, palliative), numbers are given in Table 2. Furthermore, fallers with a STRATIFY score of 0 who nevertheless fell ($n = 12$) were

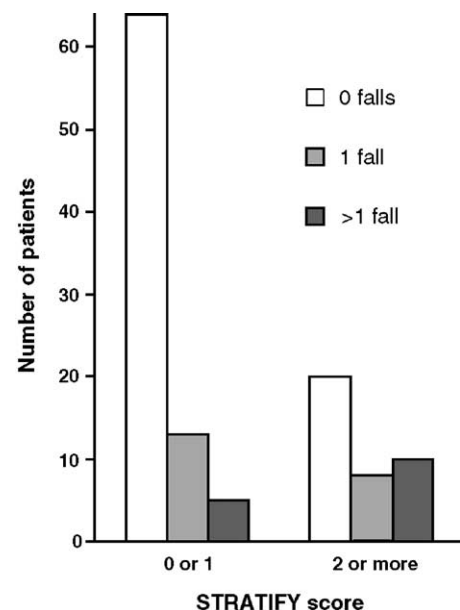


Fig. 2. The STRATIFY score of ($n = 120$) patients, related to the number of falls. Nursing home Antonius Binnenweg, Rotterdam, June 1, to December 31, 2000.

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