

Risk of Four Geriatric Syndromes: A Comparison of Mental Health Care and General Hospital Inpatients

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Abstract

An observational, cross-sectional study is conducted to compare elevated risk scores of four geriatric syndromes (falls, malnutrition, physical impairment, delirium) in older hospitalized psychiatric patients (n=178) with patients hospitalized in a general hospital (n=687). The median age of all patients was 78 years (IQR 73.3-83.3), 53% were female. After correction for age and gender, we found significantly more often an elevated risk in the mental health care group, compared to the general hospital group of falls (Odds Ratio (OR) = 1.75; 95% Confidence Interval (CI) 1.18-2.57), malnutrition (OR = 4.12; 95% CI 2.67-6.36) and delirium (OR = 6.45; 95% CI 4.23-9.85). The risk on physical impairment was not statistically significantly different in both groups (OR = 1.36; 95% CI .90-2.07). Older mental health care patients have a higher risk to develop geriatric syndromes compared to general hospital patients with the same age and gender, which might be explained by a higher level of frailty.

Key words: Older patients, prevalence, mental health care, general hospital, geriatric syndromes, frail(ity).

Introduction

The Safety Management Programme [in Dutch: VeiligheidsManagementSysteem (VMS)] has been implemented in general hospitals in The Netherlands in 2008 to reduce adverse health outcomes. One of the components of this system is the VMS ‘older patients screening instrument’, that is obligatory to conduct in hospitalized patients aged 70 years and older (1). This screening instrument consists of 13 questions to identify an elevated risk of four geriatric syndromes that are common in patients aged 70 years or above, i.e. falls, malnutrition, physical impairment and delirium (2, 3). The occurrence of at least one of these geriatric syndromes is associated with irreversible loss of function in 30 to 60% of hospitalized older patients (4-6). This loss of function may increase further after discharge, which may lead to rehospitalization, admission to a nursing home or death (1, 4, 6). Early identification of an elevated risk of these four geriatric syndromes should be followed by a treatment plan to prevent loss of function due to hospitalization and to improve hospital

outcomes (7, 8).

In mental health care, geriatric syndromes have received little attention. Nonetheless, several recent studies have found an association between psychiatric disorders and physical frailty. Most of these studies were confined to older patients with depressive disorder (9, 10). The reciprocal relationship between depression and disability in older adults is also known (11). To our knowledge, only two studies have examined frailty among a mixed group of psychiatric patients. The first study was a population based study that included all psychiatric disorders and found a higher prevalence of frailty among older people with a psychiatric disorder compared to older people without a psychiatric disorder (12). The second study was conducted among acutely admitted older patients in mental health care and found that 52% of 120 patients was frail, 34% was malnourished and had a high level of multimorbidity (13). Therefore, psychiatric inpatients might be at increased risk for the onset of geriatric syndromes.

The above studies suggest that screening of geriatric syndromes in mental health settings could be as useful as in general hospitals. The aim of this study was to assess the prevalence of elevated risks of the four geriatric syndromes of the VMS ‘frail older adults’ screening instrument (falls, malnutrition, physical impairment and delirium) and to compare these with the prevalence of elevated risks in patients admitted to a general hospital. In addition, the prevalence of an elevated risk of these four geriatric syndromes was compared between four major psychiatric diagnostic groups; psychotic disorder, unipolar depression, bipolar disorder, and neurocognitive disorder (NCD).

Methods

Design and Setting

The current study was an observational, cross-sectional study comparing patients admitted to two mental health care institutes (Parnassia Groep and Pro Persona Mental Health Care) with patients admitted to all wards except Intensive Care Units

(ICU) of a general hospital (Deventer General Hospital) in The Netherlands. The departments of surgery (21.2%), cardiology (15.8%), internal medicine (13.8%) and gastroenterology and hepatology (11.3%) were the largest within the general hospital group. The proportion of the remaining departments was below 10% and for the clinical geriatrics departments even less than 5%.

Participants

All patients who were admitted to old age psychiatric wards of both mental health care institutes for at least 24 hours, between September 2016 and December 2016, were included. In both institutes, 60 years was the minimal age to be admitted on the old age wards. These patients were compared with 687 patients aged over 70 who had been hospitalized for at least for 24 hours between March 28, 2011 and June 10, 2011 to the non-ICU wards at the Deventer General Hospital in The Netherlands and who underwent the VMS screening instrument for geriatric syndromes (14).

Procedures

Each newly admitted patient was assessed with the VMS screening instrument by a physician assistant or nurse. This screening instrument was part of our routine intake procedure, and patients were asked to sign written informed consent to use data anonymously. According to national law, formal review by a Medical Ethics Committee was not considered necessary since we only used data already collected for clinical reasons and there was no risk for harm to the participants.

Measures

The VMS screening instrument (See Supplementary table S1) was used in both psychiatric and general hospital settings. Fall risk was assessed by asking the patient if he or she has fallen during the past 6 months and 'yes' was considered an elevated risk of falling.

Malnutrition risk was identified by the Short Nutritional Assessment Questionnaire (SNAQ) (15). An elevated risk of malnutrition was defined as SNAQ score ≥ 2 .

For physical impairments the six-item Katz activities of daily living (ADL)(16) was used. This contains questions about eating, bathing, using the toilet, getting dressed, moving from bed to chair, and the use of incontinence materials. A score on Katz ADL higher than 2 was considered an elevated risk of physical impairments. Delirium risk was screened with three questions. A positive answer to one or more of these questions was considered an elevated risk of delirium.

We collected demographical variable (age, gender) and psychiatric diagnosis from the patient's electronic medical files and have grouped psychiatric diagnoses into four major groups; psychotic disorder, unipolar depression, bipolar disorder and NCD. Sample size of other psychiatric diagnoses were expected to be too small and too heterogeneous to be grouped.

Statistical Analysis

Descriptive analysis was used to calculate the mean and standard deviation (SD) of normally distributed variables. Non-normally distributed variables were presented as median with InterQuartile Ranges (IQR). First, we compared the proportions of elevated risk scores of the four geriatric syndromes between the mental health care group and the general hospital group, and between the four major psychiatric diagnostic groups with chi-squared tests. Two sensitivity analyses were performed, one including only patients of at least 70 years, and another excluding the NCD group. A post hoc chi-squared test was performed to compare the group of neurocognitive disorders with the combined other diagnostic groups.

Finally, we used logistic regression analysis to calculate odds ratios (ORs) with corresponding 95% confidence interval (CI) of elevated risk scores, corrected for age and gender, for mental health care patients compared to general hospital patients. P-values < 0.05 were considered statistically significant. Given frailty is more prevalent in women (17), we corrected for age and gender in our multivariate analyses. All analyses were performed using SPSS version 25.0 (SPSS, Inc., Chicago, IL).

Results

Sample Characteristics

Table 1 shows the demographic and clinical characteristics of our study group. A total of 865 patients were included, 687 patients from the general hospital and 178 patients from the mental health care institutes. For the combined groups, the median age was 78 year (IQR 73.3-83.3) and the majority (N=462, 53%) were female. In the mental health group, women were overrepresented.

The mental health care group had a significantly higher elevated risk on malnutrition and delirium, compared to the general hospital group (Table 1). However, the cut-off for selecting patients in general hospitals was 70 years, compared to 60 years in the mental health care institutes. When we selected in both settings only patients aged ≥ 70 years, this resulted in a significantly higher prevalence of elevated fall risk (48.6 % versus 35.8%, X^2 (df=1) = 6.33, $P = .01$), malnutrition risk (40.5% versus 14.3%, X^2 (df=1) = 44.86, $P < .001$), and delirium risk (75% versus 41.3%, X^2 (df=1) = 47.84, $P < .001$), in the mental health care group (n = 124), compared to the general hospital (n = 687).

In the second sensitivity analysis, excluding psychiatric patients with a NCD, except for elevated fall risk, the results remained significant: a significantly higher prevalence of elevated malnutrition risk (21.2% versus 14.3%, X^2 (df=1) = 4.11, $P = .04$), and delirium risk (77.5 % versus 41.3%, X^2 (df=1) = 57.06, $P < .001$), in the mental health group (n = 132), compared to the general hospital (n = 687).

Logistic regression analysis (See Supplementary table S2) of the risk of the four different geriatric syndromes, corrected for age and gender, also found a significantly higher risk in the mental health care group for falls (B = .56, $P < .001$, OR = 1.75; 95% CI 1.18-2.57), malnutrition (B = 1.42, $P < .001$, OR

Table 1. Demographical and Clinical Characteristics of the Study Group (N = 865)

	General hospital (N = 687)	Mental health (N = 178)	Group differences (N = 865)
Median (IQR) age (years)	78.7 (74.8-84.2)	73 (69.0-79.0)	U = 35815.00, z = -8.61, P = .000, r = -.29
Gender (Female (%))	39 (49.3)	123 (69.1)	X ² (df=1) = 22.17, P < .001
VMS syndromes			
Fall risk, n (%)	246 (35.8)	155 (41.9)	X ² (df=1) = 2.04, P = .15
Malnutrition risk, n (%)	98 (14.3)	56 (34.1)	X ² (df=1) = 35.31, P < .001
Physical impairments risk, n (%)	241 (35.1)	55 (31.4)	X ² (df=1) = 0.83, P = .36
Delirium risk, n (%)	284 (41.3)	129 (72.1)	X ² (df=1) = 53.75, P < .001
Accumulation of VMS syndromes n (%)			
0	236 (34.4)	16/142* (11.3)	X ² (df=1) = 29.64, P < .001
1	190 (27.7)	42/142* (29.6)	X ² (df=1) = 0.22, P = .64
2	133 (19.4)	45/142* (31.7)	X ² (df=1) = 10.61, P = .001
3	99 (14.4)	25/142* (17.6)	X ² (df=1) = 0.94, P = .33
4	29 (4.2)	14/142* (9.9)	X ² (df=1) = 7.61, P = .006

Abbreviations: IQR = Interquartile range, df = degrees of freedom, P = p-value; *The n is different across the VMS syndromes, because of missing values.

Table 2. Prevalence of Elevated Risk Scores for Geriatric Syndromes in Different Psychiatric Diagnosis Groups

	Unipolar Depression (n= 58)	Bipolar Disorder (n=24)	Neurocognitive Disorder (n= 38)	Psychotic Disorder (n= 39)	Group Differences
Fall risk n (%)	20/48*(41.7)	10/21* (47.6)	19/33* (57.6)	6/33* (18.2)	X ² (df=3) = 11..26, P = .01
Malnutrition risk n (%)	19/54*(35.3)	3/23* (13.0)	16/33* (48.5)	8/34* (23.5)	X ² (df=3) = 9.30, P = .03
Physical impairments n (%)	16/56* (28.6)	7/23* (30.4)	21/38* (55.3)	9/38* (23.7)	X ² (df=3) = 10.29, P = .02
Delirium risk n (%)	34/58 (58.6)	20/24 (83.3)	35/38 (92.1)	27/39 (69.2)	X ² (df=3) = 14.69, P < .001

Abbreviations: df= degrees of freedom, P = p-value; *The n is different across the VMS syndromes, because of missing value

= 4.12; 95% CI 2.67-6.36) and delirium (B = 1.86, P < .001, OR = 6.45; 95% CI 4.23-9.85), compared to the general hospital group. The difference in the risk of physical impairments in the mental health care group was not statistically significant (B = .31, P = .14, OR = 1.36; 95% CI .90-2.07).

Table 2 shows the prevalence of an elevated risk of four geriatric syndromes within four major psychiatric diagnostic groups. The percentage of elevated risk scores was the highest in the NCD group compared to the other diagnosis groups. To investigate whether this overall significant difference can be explained by the NCD group, a post hoc test revealed that the percentage of an elevated physical impairments (X² (df=1) = 12.80, P < .001), delirium risk (X² (df=1) = 9.62, P = .002); fall risk (X² (df=1) = 4.21, P = .04) was significantly more prevalent in the NCD group, compared to the combined other diagnostic group. There was a trend for a higher malnutrition risk in the NCD group compared to the combined other diagnostic group (X² (df=1) = 3.78, P = .05).

Discussion

We found that patients admitted to mental health care institutes, had significantly more often an elevated risk for falls, malnutrition and delirium, compared to general hospital patients, corrected for age and gender.

Antipsychotics, antidepressants and benzodiazepines are consistently associated with a higher risk of falls (18). It is

likely that all patients admitted to psychiatric wards use these drugs and assessing previous falls might improve awareness of fall risk in these patients. The high risk on malnutrition we found is in line with the aforementioned study on acutely admitted older adults to psychiatric wards (13). The higher delirium risk score may be the results of a different interpretation of the screening question concerning confusion (See table S1) in both settings. In a general hospital it is likely to assess the presence of a previous delirium due to an acute somatic illness or surgical procedure. In a mental hospital it is likely to be referred to (previous) symptoms of a psychiatric disorder. For this reason, this screening question is not likely to be valid for screening for risk on delirium in a mental hospital.

We could also compare the outcomes of screening for geriatric syndromes between patients with different psychiatric disorders. The NCD group had statistically significant more often elevated risk scores compared to the other combined diagnostic groups. Neurocognitive disorders are associated with an elevated delirium risk (19), falls (20, 21), malnutrition (22, 23) and physical impairments (24). However, the high scores of elevated risk of these four geriatric syndromes in patients with bipolar disorders and psychotic disorders is an indication that geriatric syndromes are also associated with other mental disorders than NCD or depression.

A strong point of this study is it being the first, as far as we know, in using the same screening instrument for geriatric

syndromes in mental health care inpatients, comparing the results with general hospital inpatients. Despite the strengths, this research also has some weaknesses. The number of participants in the mental health care group was relatively small compared to the general hospital group. Moreover, data of the underlying somatic diseases of patients admitted to a general hospital were not available. This would have been relevant for a more detailed comparison between these patients and psychiatric inpatients as all clusters of chronic diseases have been associated with increased levels of frailty (25). The number of patients within the 4 diagnostic subgroups of psychiatric patients were also small. Psychiatric diagnosis were made by different mental health care teams in two hospitals and we did not assess interrater reliability. Only a limited number of variables were collected in both settings and could be used to compare both groups.

Nevertheless, our results suggest that mental health care inpatients may be at higher risk for geriatric syndromes, especially malnutrition and falls, compared to general hospital inpatients. Although the predictive value of screening older psychiatric (in-)patients for geriatric syndromes has to be established, we recommend that screening should be considered from the age of 60. Older psychiatric patients may need a more broader, geriatric perspective and screening should be considered as first step followed by prevention and treatment plans for geriatric syndromes.

Key points

- Older mental health care inpatients have a higher risk of falls, malnutrition and delirium than older general hospital inpatients.
- Within the mental health care group, patients with a neurocognitive disorder were at highest risk of geriatric syndromes.
- Screening for geriatric syndromes should be considered in mental health care patients from the age of 60.

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Conflict of interest: The authors have no conflicts of Interest.

Ethical standard: The screening instrument, we used in our study was part of our routine intake procedure, and patients were asked to sign written informed consent to use data anonymously. According to national law, formal review by a Medical Ethics Committee was not considered necessary since we only used data already collected for clinical reasons and there was no risk for harm to the participants.

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