Delirium in Older Patients Admitted to General Internal Medicine

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ABSTRACT

Delirium on the day of admission to general internal medicine wards was studied in 400 consecutive patients aged 70 years and above regarding occurrence, associated factors, clinical profile, length of hospital stay, and mortality. The patients were assessed using the Organic Brain Syndrome Scale and the Mini-Mental State Examination, and delirium was diagnosed according to *Diagnostic and Statistical Manual of Mental Disorders* (4th ed) criteria. Delirium on the day of admission occurred in 31.3% of the patients and was independently associated with old age, fever on the day of admission (≥38°C), treatment with neuroleptics, impaired vision, male sex, and previous stroke. Delirious patients had longer hospital stay (15.4 vs 9.5 days, $P < .001$), a higher mortality rate during hospitalization (11/125 vs 5/275, $P < .001$), and a higher 1-year mortality rate (45/125 vs 55/275, $P = .001$). Delirium is a common complication with often easily identified causes, and it has a serious impact on outcome for older medical patients. (*J Geriatr Psychiatry Neurol* 2006;19:83-90)

Keywords: delirium; clinical profile; length of hospitalization; mortality; general internal medicine

Delirium is a common neuropsychiatric syndrome in older people admitted to hospital and is probably the most common presenting symptom of acute diseases in old age.[1] Delirium is characterized by impaired attention and cognition and a fluctuating course, and it always has, by definition, 1 or several etiologic factors.[2]

Delirium occurs in 14% to 42% of older people admitted to general internal medicine or acute geriatric units[3-9] and in 28% to 61% of older patients treated for hip fractures.[10-12] In general internal medicine or acute geriatric units, delirium has been reported to be associated with old age, dementia, disease severity, stroke, myocardial infarction, pneumonia, drugs with anticholinergic properties, polypharmacy, malnutrition, and electrolyte disturbances.[4,6,13-17] Delirium has also been reported to be associated with prolonged hospitalization,[3,9] increased mortality rate,[18-20] and the development of dementia.[19,21,22]

Delirium has been classified into 3 subtypes, the hyperactive–hyperalert, the hypoactive–hypoalert, and the mixed type.[17,23] Hyperactive delirium (ie, restlessness/agitation, irritability, and aggression) is easy to detect compared with hypoactive delirium (ie, latency in reaction and in response to verbal stimuli and psychomotor slowing). Patients with hypoactive delirium seem to have a poorer prognosis than patients with hyperactive delirium.[23,24]

Little is known about diurnal variations in symptoms related to delirium, and few studies have reported on the prevalence of symptoms associated with delirium.[10,25] It has been suggested that delirium also may be classified

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into psychotic or emotional delirium or a mixed type with both an emotional and a psychotic profile.[25]

Despite the clinical significance of delirium, only 1 successful intervention study and several studies without any significant effect in general internal medicine have been published.[26-29] Thus more knowledge is needed about the predisposing and precipitating factors for delirium in medical departments.

The aim of the present investigation was to study delirium, on the day of admission, in older patients admitted to general internal medicine wards regarding occurrence, associated factors, clinical profile, length of hospital stay, and mortality.

METHODS

Patients

Four hundred patients, aged 70 years and above, consecutively admitted to 2 of the 5 wards of the Department of General Internal Medicine at Sundsvall Hospital, Sweden, during an 8-month period were included in the study. At Sundsvall Hospital, demented patients with delirium were often admitted to the psychiatric or geriatric departments, patients admitted from different types of residential care facilities were often admitted immediately to the geriatric department, and all patients with acute stroke were admitted to the department of internal medicine.

The only exclusion criteria were age under 70 and the patients' unwillingness to participate. The patients were mainly (93, 8%) admitted directly from the emergency room. One of the wards subspecialized in endocrinology, and its planned admissions were mainly patients with diabetes complications. All other patients were included regardless of diagnoses. One of the wards was included in an intervention study with the aim to investigate whether an education program and a reorganization of nursing and medical care improved the outcome for older delirious patients.[30] Because only delirium on the day on admission was considered in the present study, the patients in the intervention group were included in the analysis of risk factors for delirium on admission.

Ethical Considerations

The participating patients gave their informed consent orally after being told about the study and also that their participation or refusal would not affect their medical or nursing care. In cases of patients with cognitive impairment on admission, the next of kin were also asked.

The Ethics Committee of the Faculty of Medicine at Umeå University approved the study (§500/02, dnr 02-452).

Data Collection

All patients were examined by means of a modified version of the Organic Brain Syndrome Scale (OBS scale), a combined observation and interview scale.[31] The OBS scale has 2 parts: the disorientation subscale, which is a 16-item questionnaire, and the confusion subscale, which is an observation schedule covering 39 clinical features. The confusion subscale used in this study describes various cognitive, perceptual, emotional, and personality variables and fluctuations in the person's clinical state. The Mini-Mental State Examination (MMSE) was used instead of the disorientation subscale.[32]

The OBS scale has shown good concurrent validity.[31] It has also been compared with the Confusion Assessment Method and showed 100% agreement in a study regarding the diagnosis of postoperative delirium in patients undergoing coronary bypass surgery.[33] The OBS scale offers a broad description of reported and observed signs of organic brain syndromes as well as fluctuations in the patients' clinical state. The OBS scale thus allows more signs and symptoms to be registered than a pure interview or observation instrument. Registered psychiatric and behavior symptoms indicating hyperactive delirium (ie, restlessness/agitation, irritability, and aggression) and symptoms indicating hypoactive delirium (ie, latency in reaction and in response to verbal stimuli and psychomotor slowing) were used to classify the patients into hyperactive, hypoactive, mixed delirium (ie, both hyperactive and hypoactive delirium), or unclassifiable delirium. We also used conspicuous emotional symptoms (ie, depressed mood, emotional lability, and anxiety) and psychotic symptoms (ie, hallucinations or illusions, delusions, and paranoiac symptoms) to categorize the delirious patients regarding pronounced emotional and psychotic symptoms. The patients were classified as having morning delirium if they had the most pronounced symptoms in the morning and showed improvement during the day and evening delirium if the delirium started in the afternoon or evening.[25,31,34]

The patients were examined on days 1, 3, and 7 during their ward stay by 1 of 3 full-time research assistants (2 psychiatric licensed practical nurses and 1 registered occupational therapist) who had been trained to use the OBS scale and the MMSE and had experience using them from another large study that included 717 patients.[25,34] The same research assistant usually assessed each patient. The research assistants had ongoing discussions about their use of the scales in order to maintain consistency. The patients were independently diagnosed regarding delirium and dementia according to *Diagnostic and Statistical Manual of Mental Disorders* (4th ed) *(DSM-IV)* criteria by 3 of the authors. The combination of repeated cognitive testing with the MMSE and the documentation of different observations and ratings of a fluctuation course and different symptoms associated with delirium in the OBS scale were used to decide if the patient fulfilled all the *DSM-IV* criteria for delirium on the day of admission.

Table 1. Age, Sex, and Previous Diagnoses in Patients With and Without Delirium on the Day of Admission

	Delirious n = 125	*Nondelirious n = 275*	P *Value*
Sex (m/f)	66/59	111/164	.020
Age (mean ± SD)	81.8 ± 6.3	79.4 ± 5.7	<.001
Hearing (with or without hearing aid from a distance of 1 meter)	114 (91.2)	271 (98.5)	.005
Vision (reads the paper with or without glasses)	82 (65.6)	239 (86.9)	<.001
Cardiac infarction	25 (20.0)	52 (18.9)	.798
Stroke	45 (36.0)	54 (19.6)	<.001
Dementia	7 (5.6)	3 (1.1)	.012
Depression	4 (3.2)	8 (2.9)	1.000
Diabetes	37 (29.6)	95 (34.5)	.330
Epilepsy	10 (8.0)	8 (2.9)	.023
Alcohol problems	4 (3.2)	2 (0.7)	.079
Auricular fibrillation	24 (19.2)	55 (20.0)	.852
Glaucoma	15 (12.0)	16 (5.8)	.032
Lung disease	21 (16.8)	53 (19.3)	.555
Gastric disease	30 (24)	62 (22.5)	.749
Malignancy	9 (7.2)	35 (12.7)	.102
Kidney disease	6 (4.8)	14 (5.1)	.902
Previous delirium	7 (5.6)	0 (0.0)	<.001

Note: Values are n (%) unless noted.

The cognitive testing on day 3 and 7 was used to detect and validate the diagnosis of delirium on admission. For example, if a patient had low MMSE scores on admission, which could indicate symptoms of dementia, and then significantly improved in MMSE scores on day 3 and 7 in combination with a fluctuating course reported on day 3 and/or 7, the patient could be classified as having either delirium or dementia with superimposed delirium on admission. This means that, for example, in patients with dementia, the cognitive impairment found by the assessment with the MMSE on admission could either be cognitive impairment caused by the patient's dementia or the combination of delirium and dementia. The assessment with MMSE on day 3 and/or 7 in combination with a report of fluctuation of symptoms indicating delirium according to the OBS scale was necessary to validate the diagnosis of delirium on the day of admission in patients with dementia.

From a single assessment on admission it is often impossible to decide if the patient has a prevalent or incident delirium. In the present study we only focused on delirium on the day of admission, and therefore we chose not to differentiate between prevalent and incident delirium. In the few cases where there was disagreement regarding the diagnoses of delirium and dementia in this study, the case was discussed until a consensus was reached. These 3 authors have also collaborated in another study using the OBS scale, where they reached greater than 90% agreement in all ratings.[35] The repeated assessment with MMSE and the OBS scale, which included assessments of the patients as well as interviews with staff and reviews of the nursing and medical records, was used to establish a fluctuating course and type of diurnal variation. Similarly, the same assessments and documentation were used to classify the delirium into different subcategories such as hyperactive and hypoactive delirium.

Further relevant information (eg, living conditions, ongoing treatments, and diagnoses) about the patients were obtained from the patients themselves, their spouses, nursing and medical staff, and patient records. Death certificates were collected from the National Department of Health and Welfare, Epidemiologic Centre and from Statistics Sweden for all participants who had died within 1 year after admission.

Statistics

Univariate analyses using Student *t* test and Pearson's chi-square test were performed to describe differences between groups. A P level <.05 was considered to be statistically significant.

Factors associated with delirium were first entered into a factor analysis to check for multicollinearity and then entered into a logistic regression analysis to find factors independently associated with delirium on admission. Factors associated with prolonged hospital stay and mortality were similarly included in multiple regression analyses.

Kaplan-Meier survival analysis was used for comparison of patients with and without delirium on the day of admission.

RESULTS

Almost one third (31.3%) of the patients were delirious on the day of admission (within the 24 hours after admission). Delirium on the day of admission was in univariate analyses associated with old age, male sex, impaired vision and hearing, previous dementia diagnosis, previous stroke, epilepsy, glaucoma, and previously registered delirium (Table 1).

Table 2. Presenting Symptoms, Diagnoses, and Regular Drug Treatment on Admission in Patients With and Without Delirium on the Day of Admission

	Delirious n = 125	*Nondelirious n = 275*	P *Value*
Dyspnea	17 (13.6)	60 (21.8)	.053
Angina pectoris	18 (14.4)	45 (16.4)	.617
Asthma	13 (10.4)	32 (11.6)	.717
Stroke	36 (28.8)	48 (17.5)	.010
Depressed mood	20 (16.0)	28 (10.2)	.072
Epilepsy	10 (8.0)	12 (4.4)	.139
Fever (≥38°C)	14 (11.2)	10 (3.6)	.003
Constipation	10 (8.0)	19 (6.9)	.697
Cardiac infarction	5 (4.0)	24 (8.7)	.091
Heart failure	22 (17.6)	80 (29.1)	.015
Hypertension	39 (31.2)	113 (41.1)	.059
Indisposition, vomiting	20 (16.0)	30 (10.9)	.154
Infection	27 (21.6)	43 (15.6)	.146
Urinary catheter	10 (8.0)	7 (2.5)	.012
Pneumonia/bronchitis	10 (8.0)	13 (4.7)	.192
Gastric ulcer	2 (1.6)	7 (2.5)	.726
Malignancy	4 (3.2)	11 (4.0)	.785
Pain	27 (21.6)	56 (20.4)	.777
Subdural hematoma	2 (1.6)	2 (0.7)	.592
Transient ischemic attack	7 (5.6)	16 (5.8)	.931
Urinary tract infection	9 (7.2)	11 (4.0)	.173
Deep vein thrombosis	1 (0.8)	9 (3.3)	.182
Dizziness	10 (8.0)	38 (13.8)	.097
Antibiotics	18 (14.4)	27 (9.8)	.179
Oral antidiabetics	14 (11.2)	32 (11.6)	.899
Antiepileptics	9 (7.2)	8 (2.9)	.049
Analgesics	31 (24.8)	84 (30.5)	.239
Antidepressants	5 (4.0)	8 (2.9)	.555
Benzodiazepines	8 (6.4)	19 (6.9)	.851
β-blockers	29 (23.2)	62 (22.5)	.885
Calcium-blockers	17 (13.6)	40 (14.5)	.802
Digoxin	29 (23.2)	85 (30.9)	.113
Diuretics	62 (49.6)	170 (61.8)	.022
Insulin	15 (12.0)	45 (16.4)	.257
Neuroleptics	22 (17.6)	16 (5.8)	<.001
Nitroglycerin	34 (27.2)	104 (37.8)	.038
Opioid	9 (7.2)	30 (10.9)	.246
Number of drugs (mean ± SD)	3.5 ± 2.6	4.2 ± 2.9	.036
No drugs	13 (10.4)	25 (9.0)	.679

Note: Values are n (%)

Precipitating delirium symptoms and diagnoses were stroke and fever on day 1 (≥38°C), and delirium was also associated with treatment with a urinary catheter (Table 2). Treatment with antiepileptics and neuroleptics, but no other drugs, was associated with the risk of being delirious on the day of admission (Table 2). Fewer patients prescribed diuretics and nitroglycerine were delirious on admission, and patients delirious on admission took fever drugs according to univariate analyses. There were no differences regarding mean values in laboratory tests between those patients delirious on admission and those not delirious on admission, and there were no differences regarding proportion of patients with pathological values in laboratory tests between those delirious and those not delirious on the day of admission (Table 3).

A multivariate logistic regression analysis showed that old age, fever on the day of admission (≥38°C), ongoing treatment with neuroleptics, impaired vision, male sex, and previous stroke were the factors independently associated with delirium on the day of admission (Table 4).

Thirty patients (24.0%) had hypoactive delirium, 27 (21.6%) had hyperactive delirium, 19 (15.2%) had mixed delirium, and 49 (39.2%) could not be classified. Sixty patients (48.0%) had predominantly emotional delirium, 24 (19.2%) had psychotic delirium, and 15 (12%) were judged to have mixed emotional and psychotic delirium. Twenty-six (20.8%) could not be classified in this respect.

It was possible to categorize diurnal variation in 73/125 (58.4%) of those delirious on the first day of admission. Thirty-two (25.6%) patients had afternoon–evening–nighttime delirium and 30 (24.0%) patients had fluctuating delirium throughout the day and night. Three (2.4%) patients had night–morning delirium and 8 (6.4%) patients were delirious only in the morning. In

Table 3. Blood Chemistry on Admission in Patients With and Without Delirium on the Day of Admission

	Delirious n = 125	*Nondelirious n = 275*	P *Value*
B-hemoglobin, g/L, mean ± SD, n = 118/264	133.7 ± 20.4	133.0 ± 19.4	.752
P-potassium, mmol/L, mean ± SD, n = 119/268	4.1 ± 0.5	4.1 ± 0.6	.202
P-sodium, mmol/L, mean ± SD, n = 120/268	139.3 ± 3.5	138.9 ± 3.8	.387
P-creatinine, µmol/L, mean ± SD, n = 119/266	111.1 ± 42.8	108.9 ± 51.0	.677
P-calcium, mmol/L, mean ± SD, n = 114/261	2.5 ± 0.5	2.5 ± 0.2	.219
B-glucose, mmol/L, mean ± SD, n = 106/245	7.3 ± 4.4	7.9 ± 5.3	.259
P-albumin, g/L, mean ± SD, n = 115/262	37.8 ± 5.6	38.4 ± 5.2	.313
B-ESR, mmol/h, mean ± SD, n = 110/249	30.4 ± 24.0	27.1 ± 21.2	.189

Table 4. Multivariate Logistic Regression Analysis of Factors Associated With Delirium on the Day of Admission

Independent variable	*OR*	*95%CI*
Fever on the day of admission	3.622	1.417-9.258
Ongoing treatment with neuroleptics	3.078	1.471-6.438
Impaired vision	2.260	1.224-4.174
Previous stroke	1.927	1.126-3.298
Male sex	1.814	1.116-2.948
Old age	1.070	1.027-1.114

Note: OR, odds ratio; CI, confidence interval. Model chi-square 53.699; $P < .001$. Concordant 74.3%.

44 (35.2%) of the delirious patients, delirium was detected and diagnosed only after repeated cognitive assessments and it was not possible to determine any diurnal variation on the day of admission. In another 8 (6.4%) patients, fluctuations were only documented between days.

Patients who were delirious on the first day of admission had significantly longer hospital stays, 15.4 ± 14.2 days compared with 9.5 ± 7.8 days for those who were not delirious ($P < .001$). Despite the longer hospital stay for delirious patients, fewer delirious patients could return to independent living (own house or own apartment with or without home help) on discharge: 66/96 (68.8%) compared with 221/244 (90.6%, $P < .001$) of those without delirium on the day of admission.

Mortality rate during hospital stay was significantly higher among those delirious on the day of admission: 11/125 (8.8%) compared with 5/275 (1.8%) of those without delirium on the day of admission ($P = .001$). Six of those with delirium on the day of admission died from stroke, 4 from myocardial infarction, and 1 from pneumonia. Survival curves for patients with and without delirium on the day of admission are presented in Figure 1. Within 1 year, 45/125 (36 %) of those delirious on the day of admission had died compared with 55/275 (20%) of those without delirium ($P = .001$). There were no differences between hypoactive and hyperactive delirium regarding those who died during follow-up (data not shown). The most important independent predictor of length of hospital stay was delirium on the day of admission, and for 1-year mortality it was delirium on the day of admission and heart failure on admission (data not shown). The difference in survival rates between those delirious and those not delirious on the day of admission was not explained by any other factors. The majority of delirious patients had died from heart diseases and stroke within 1 year, according to the death certificates.

DISCUSSION

The main finding in this study is that delirium is common among older patients admitted to departments of general internal medicine. Delirium on the day of admission was independently associated with old age, fever on the day of admission (≥38°C), ongoing treatment with neuroleptics, impaired vision, male sex, and previous stroke in multivariate logistic regression analyses. Delirium seems to have an independent, serious impact on duration of hospital stay, discharge disposition, and both short- and long-term mortality rates.

The occurrence of delirium is somewhat higher here than in the majority of previously published articles on corresponding populations.[3-9] One reason for this might be that more cases of delirium are detected if cognitive tests are repeatedly administered. Underdiagnosis of delirium in patients with dementia is probably common if the cognitive tests are not repeated, and a single assessment can probably result in an overdiagnosis of dementia if information about a fluctuating course is not available on admission to hospital. Hypoactive delirium especially can be overlooked if the patient is not tested cognitively.[23] Other reasons for the relatively high occurrence of delirium are that patients with dementia were not excluded from the present study and that the mean age of the participants in this study was high.

The risk factors as well as the precipitators for delirium found in this study support previous research in this field.[4,6,13-17] Old age as well as diseases and drugs that reduce brain capacity lower the delirium threshold. Vision and hearing are a prerequisite for being able to recognize and understand one's situation and the surroundings. It is thus important, according to several

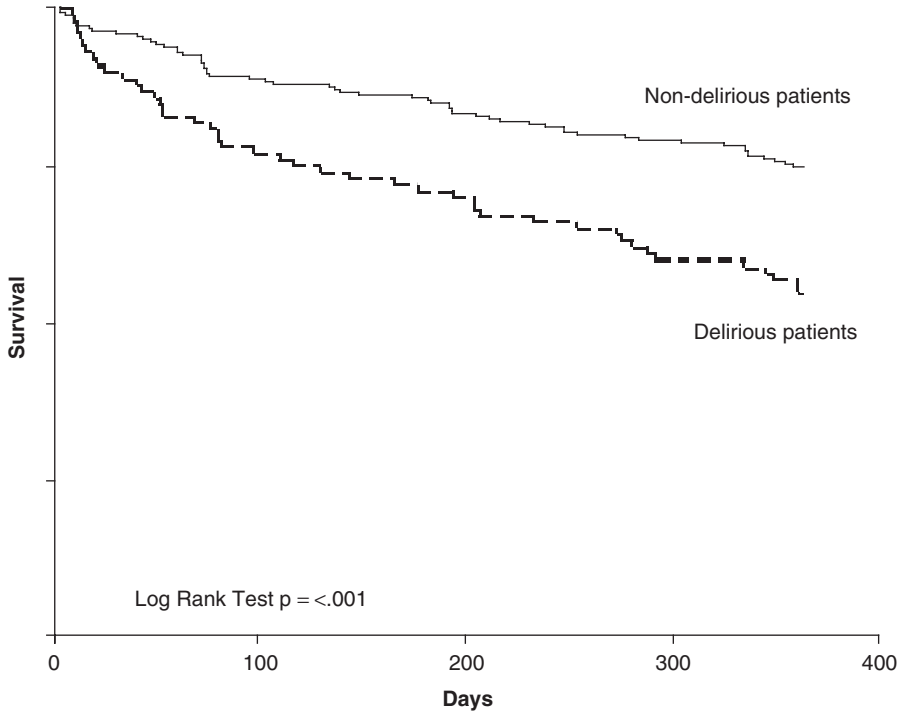

Figure 1. Kaplan-Meier plots comparing 1-year survival in older patients with and without delirium on the day of admission.

intervention studies, to do whatever possible to improve vision and hearing by supporting the patients with glasses and hearing aids.[26,36-38] Male sex was an important risk factor for the development of delirium, as has been reported previously.[39,40] In the study by Edlund et al[40] of delirium after hip fractures it was found that the men were in poorer health than the women, which explained the higher occurrence of delirium among men. However, this was not the case in our study; the men were in fact healthier and younger than the women (data not shown).

Stroke is an important predisposing factor as well as an important precipitator for delirium, and it has been reported that about 40% to 50% of those who suffer from acute stroke develop delirium early after the incident.[41-43]

Increased body temperature in the present study was probably usually a symptom of infections even if the specific underlying infection was not always detected. However, any diagnosed specific infection was not significantly associated with delirium in the present study.

Elevated body temperature increases the metabolic demands on the brain. An increased body temperature increases the demand for oxygen supply to the brain, which might be difficult for the old patient with pulmonary and cardiovascular diseases to compensate for. Preventing hypoxemia in patients with elevated body temperature is important in preventing and treating delirium, as is lowering the elevated body temperature if possible to reduce the metabolic demands of the brain.[44]

Disturbance of the cholinergic system seems to be central in the pathophysiology of delirium. Apparently, drugs that interfere with the cholinergic system should be avoided in patients with an increased risk of developing delirium.[10,16,45] Because several neuroleptics have anticholinergic properties, they are not an appropriate treatment for delirium. However, many patients treated with neuroleptics in this study had other organic brain diseases in addition to those treated with antiepileptics, which may also have contributed to the risk of developing delirium.

Delirium was also found to be associated with treatment with a urinary catheter. Treatment with a urinary catheter could be a marker of urinary retention, which is a well-known cause of delirium,[46] but on the other hand, the catheter could itself be stressful for the patients, who might not understand the situation.

It has been reported that electrolyte disturbances and significant anemia are associated with delirium,[47,48] but, surprisingly, in laboratory tests we found no disturbances that were significantly associated with delirium in this sample.

Diurnal variation and type of delirium seem to be somewhat more difficult to assess and describe in general internal medicine patients with no obvious trauma than, for example, in patients with postoperative delirium. All patients in studies on postoperative delirium are exposed to the operation and the anesthesia, producing a more defined type of trauma or stress that

includes sedation of the patient. This might explain why diurnal fluctuations may have been less systematic in the present study. This study also includes several patients with poststroke delirium, which could also influence the patients' ability to express their feelings and the assessors' chance of detecting various symptoms. This could be the case, for example, if the patient has aphasia. Studies including a larger proportion of patients with dementia[25] have also reported a different diurnal variation that includes many patients with sundown syndrome and a larger proportion with morning delirium. One might suspect that morning delirium especially was underreported in the present study, but we have no other explanation for our low occurrence. One could expect a large proportion of the present sample to have sleep apnea syndrome (patients with stroke and heart disease), which has been suggested as a common cause of morning delirium among older patients.[25]

In this study, delirium was 1 of the most important predictive factors for length of hospital stay and for short-and-long term mortality rate. This has also been reported earlier, both for patients in general hospital care and for older patients undergoing hip surgery.[20,22,35,49] In contrast to a study by Liptzin and Levkoff,[23] we found no difference in mortality rate and hospitalization in patients with hypoactive or hyperactive delirium, which is also supported by another study.[50]

The patients were repeatedly assessed using cognitive testing and interviews with the staff who knew the patient best. This probably resulted in a high detection rate of delirium. Repeated cognitive testing seems to be necessary to detect delirium, because many cases of fluctuating attention and cognition during the day of admission were not noted by the staff and only were detected as a result of repeated and careful assessments on day 3 and/or 7. All patients diagnosed as delirious or demented met the *DSM-IV* criteria, and the OBS scale and MMSE test were used for repeated, systematic assessment and documentation of the assessments and observations. The assessments on days 3 and 7 were used to detect and validate the diagnoses of delirium on the day of admission as well as the dementia diagnoses. In the 44 patients whose delirium was diagnosed after the repeated cognitive assessments, it was impossible to decide on admission if the patient's cognitive impairment was attributable to dementia, delirium, or both.

Because delirium by definition has a fluctuating course, often including lucid intervals, it is difficult to differentiate between prevalent and incident delirium and to differentiate between dementia and dementia with delirium during a single assessment. The above-mentioned 44 patients thus fulfilled the *DSM-IV* criteria for delirium and were included in the analysis of risk factors associated with delirium on the day of admission. Because of the fluctuating course of delirium, we have not been able to differentiate between prevalent and incident delirium and have not been able to analyze different risk factors for prevalent or incident delirium on the day of admission in the present study.

The assessment of precipitating factors for delirium could probably have been performed more comprehensively to find other treatable causes. We only found that stroke and elevated body temperature on admission were important precipitating factors for delirium on a group level. However, the finding of several preventable and treatable predisposing and precipitating factors for delirium indicates that more effort has to be put into quick assessment and treatment of delirious older patients in order to improve their prognosis.

The results from the intervention group in the present study[30] and the study by Inouye et al[26] clearly show that delirium can be successfully prevented and treated in patients admitted to general internal medicine departments.

Given that predisposing and precipitating factors for delirium are usually easily identifiable among older patients admitted to departments of general internal medicine and that delirium seems to be one of the most important independent prognostic factors, more attention has to be paid to its prevention and treatment.

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