

Delirium is seen in one-third of patients in an acute hospital setting. Identification, pharmacologic and non-pharmacologic treatment is inadequate

Jens Nørbæk & Elsebeth Glipstrup

ABSTRACT

INTRODUCTION: Delirium is an organically caused acute dysfunction of the brain associated with increased morbidity, mortality, cost of care and poor cognitive recovery.

METHOD: This point prevalence study of delirium was conducted at Hvidovre Hospital, Copenhagen, Denmark at two separate occasions. Patients were examined with the Brief Confusion Assessment Method (bCAM) in both, but in the second survey bCAM was supplemented with a psychiatric assessment using the Diagnostic and Statistical Manual of Mental Disorders, fourth ed. In all, 126 patients were assessed and eight patients were excluded. The delirious patients' charts were examined.

RESULTS: Out of the 118 patients included in the study, 38 (32%) were delirious and in 18 (47%) patients, the diagnosis was documented. Furthermore, in 18 (47%) patients, a pharmacological treatment plan for agitation was prepared (in 89% of those diagnosed with delirium and in 10% of those without the diagnosis). In 26 (68%), a plan to increase care existed (in 78% of those with a diagnosis of delirium and in 60% without the diagnosis). In 11 patients (29%), there was a plan for reducing stress (in 44% of those with a diagnosis of delirium and in 15% without the diagnosis).

CONCLUSIONS: Delirium is a common phenomenon in a Danish acute hospital setting. Identification and treatment are inadequate. The diagnosis of delirium is a possible determinant for treatment and care; hence, as this study found that pharmacological treatment for agitation, optimised care and stress reduction were more frequently considered in patients with the delirium diagnosis than in patients who did not have the diagnosis.

FUNDING: This study has no external funding.

TRIAL REGISTRATION: The local Danish Research Ethics Committee was notified, but as it was a non-intervention study no permission was required.

Organic delirium is a common condition of acute brain dysfunction and is associated with increased morbidity, prolonged hospitalisation, impaired self-reliance and death [1]. The syndrome is defined as an acutely emerging, fluctuating disturbance of attention, affected cognition, sleep disturbance and affected psychomotor activ-

ity caused by a physical disease or toxicity. The psychomotor symptoms are grouped into three subtypes: hyperactive, hypoactive and mixed. Hyperactive delirium is characterised by restlessness, psychomotor hyperactivity, aggression and emotional lability. Hypoactive delirium is characterised by apathy, lethargy and slow psychomotor responses and depressive features. The mixed form of delirium is characterised by symptoms fluctuating between hyperactivity and hypoactivity [2]. Organic delirium is widely underdiagnosed [3, 4]. Several psychometric instruments have been developed to identify delirium. With the exception of the Confusion Assessment Method for the Intensive Care Unit for use in intensive care units, no instrument has been validated in a Danish setting [5].

The incidence of delirium has been found to range from 10% to 40% among patients admitted to a hospital [6]. The symptoms can persist for a few days to several months. As age is the main risk factor for the development of delirium, the problem will escalate with the increase of mean age in the population. The consequences hereof are serious, both at the individual level and for society. Delirium increases morbidity and mortality. Patients with delirium are admitted to hospital for longer periods of time and frequently experience cognitive impairment [7-9]. Furthermore, organic delirium is a significant reason for patients falling [10] and for the acquisition of bedsores in hospitals. Delirium causes increased financial costs to hospitals and nursing homes. A study found that the total estimated cost attributable to delirium ranged from 16,303 USD to 64,421 USD per patient [11]. There is no effective pharmacological treatment for delirium. The pharmacological treatment is aimed at treating the severe agitation seen in hyperactive patients that can impede other necessary care and treatment. Traditionally, the drug of choice is haloperidol.

A recent randomised study on the effect of haloperidol versus placebo found that short-term use of the drug in this context is safe and associated with few side effects. Despite having no effect on the incidence and duration of delirium, the study concluded that the treatment of

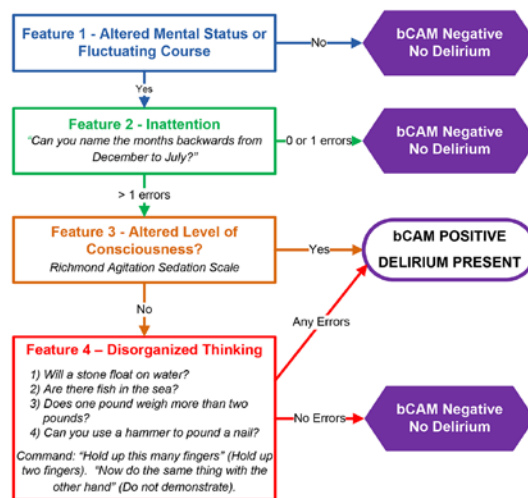
ORIGINAL ARTICLE

Liaisonpsychiatric Unit,
Psychiatric Center
Hvidovre, Denmark

Dan Med J
2016;63(11):A5293

FIGURE 1

Brief Confusion Assessment Method (bCAM) flow sheet.



Copyright © 2012, Vanderbilt University.

The Brief Confusion Assessment Method (bCAM) is adapted from: Ely EW, et al. *JAMA*. 2001; 286: 2703-2710. Confusion Assessment Method for the Intensive Care Unit. Copyright © 2002, Vanderbilt University. Inouye SK, et al. *Ann Intern Med*. 1990; 113: 941-948. Confusion Assessment Method. Copyright © 2003, Hospital Elder Life Program, LLC. Not to be reproduced without permission.



Delirium. From the latin *delirare* "to be crazy", literally, "to leave the furrow" (in plowing), from de- + lira furrow.

agitation should remain the sole motivation for the use of haloperidol [12]. Benzodiazepines are harmful when used in non-alcohol-related delirium patients [13, 14].

Non-pharmacological interventions have been examined in several studies, but no clear conclusions have been reached. However, the consensus is that intensified nursing care and stress reduction can shorten the delirium period [15-17]. To deal with delirium, it is necessary to identify the condition and treat the underlying causes as well as to intensify care, protect the patients from excessive external stimuli and promote natural sleep.

METHODS

Setting

Hvidovre Hospital is one of four main acute hospitals in Copenhagen, Denmark. The catchment area counts half a million inhabitants. The hospital had a total of 41,200 discharges in 2014. 43% of patients were more than 65 years old. The five wards included in this study represent one-third of a total 400 beds (2014) distributed on 15 wards.

The survey

The survey was performed on two separate occasions. The first took place in November 2013 on two wards (Gastric Medicine and Orthopedic Surgery). In a single day, all patients who were present on the ward were screened once with the psychometric instrument Brief

Confusion Assessment Method (bCAM) [18]. Two trained nurses from the intensive care unit and one liaison nurse did the screening. The study days were chosen randomly, and the patients were examined between 9 a.m. and 12 p.m. The same procedure was repeated in February 2014 on three additional wards (Infectious Diseases, Endocrinology and Pulmonary Medicine). This time, bCAM was supplemented with a comprehensive psychiatric assessment using the text revision criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM), fourth edition. The psychiatrist was blinded to the bCAM results. Both assessments were conducted independently within a three-hour period.

Assessment of delirium

In this study, we used the newly developed bCAM tool, which is based on the Confusion Assessment Method [19]. Both instruments use the DSM criteria as the definition of delirium. The definition has four features: 1) altered or fluctuating mental status, 2) inattention, 3) altered level of consciousness and 4) disorganized thinking. In the original validation study, the bCAM had a specificity of 96% and a sensitivity of 84% when performed by a physician compared with a reference standard based on a comprehensive assessment by a psychiatrist. bCAM was translated into Danish and re-translated back into English and finally approved by the bCAM inventor J. H. Han. **Figure 1** illustrates the features of and procedure for performing bCAM. bCAM includes

The Richmond Agitation Sedation Scale (RASS). RASS assesses the arousal level and ranges from -5 (coma) to +4 (combative); a score of 0 indicates no psychomotor disturbances.

Assessment of delirium, diagnosis and interventions

In every patient found to be delirious, the charts were checked with regard to whether a diagnosis of organic delirium was documented, whether a plan for treatment of agitation was considered, and whether an individual nursing plan that was suitable for delirious patients had been made. Information was retrieved for the period from one week prior to the study day until one week after.

Following points/subjects were assessed:

1. Was a diagnosis of organic delirium registered in the chart?

If a patient had not been diagnosed with delirium, he or she was categorised as “not-documented” even if changes in both the level of consciousness and the level of agitation were documented.

2. Had pharmacological treatment of the patient's agitation been considered?

Pharmacologic treatment was defined as either regular or Pro Re Nata antipsychotics. The use of benzodiazepines was not considered a relevant treatment in this context.

3. Was a plan to increase the patient's care documented?

This was considered as documented if all of the following were done: Was the need for oxygen at a saturation < 93% assessed? Was the need for blood transfusion in anaemic patients with an Hb level < 6 mmol/l assessed? Was a doctor consulted if the blood sugar level was low or high? Was a plan made for preventing constipation and urinary retention? Had a nursing plan been made for the treatment of any pain the patient was experiencing? Was the patient weighed? Was a specialised nutrition plan made (according to local clinical guidelines)? Had steps been taken to ensure mobilisation as soon as possible?

4. Was a plan to create a stable and calm environment for the patient documented?

This was considered to have been documented if all of the following had been considered: Had the possibility of allocating extra nursing resources been considered to secure stable human contact? Was the possibility of placing the patient in a single or two-bed room to avoid unnecessary noise considered? Had actions been taken to secure the patients' access to using eyeglasses and a hearing aid? Was the patient's sleep pattern documented and was a plan made for securing the patient's

sleep? Had action been taken to secure that the patient was disturbed as little as possible during the night?

Trial registration: The local Danish Research Ethics Committee was notified, but as it was a non-intervention study, no permission was required.

RESULTS

The total number of eligible patients on the wards was 126. In all, eight patients were excluded from the study. Six declined to participate, one did not speak Danish and one patient was unconscious, making bCAM assessment impossible. On the first occasion, 51 patients were included and, on the second, 67 patients were included. Thirteen (25.5%) patients were bCAM positive in the first round and 20 (30%) patients in the second round. One patient who refused to answer the bCAM was found to be delirious by the psychiatrist. Additionally, four bCAM-negative patients were found to be delirious by the psychiatrist. Those five patients were included as delirium-positive in the further investigation.

Of the 118 patients who were included in the study a total of 38 (32%) patients were found to be delirious.

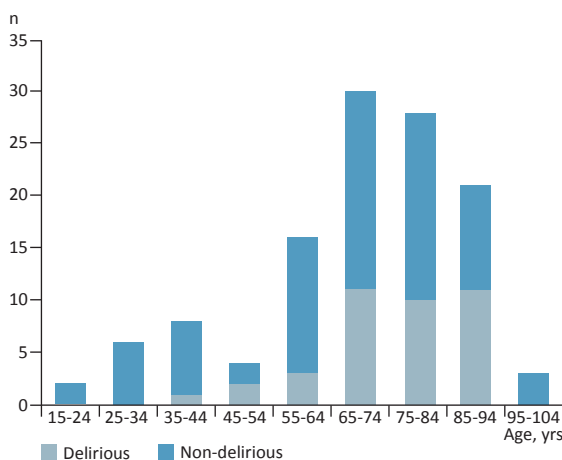
The distribution of patients with delirium according to age is presented in **Figure 2**.

The median age was higher in the delirium group (median 79 years) than in the non-delirium group (median 69.5 years). A total of 36 were younger than 65 years, among these 17% were delirious. A total of 82 patients were 65 years or older, among these 39% were delirious.

Diagnosis documented

Among the 38 patients with delirium, a documented diagnosis was found in the charts in 18 (47%). Whether a

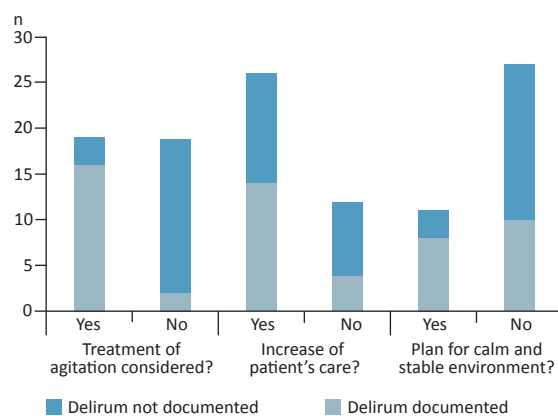
FIGURE 2



Number of patients with delirium, by age (N = 118).

FIGURE 3

Chart review in 38 delirious patients. Plan for treatment of agitation, increased patient care and creation of a calm and stable environment in patients with documented or not-documented delirium, number of patients.



patients = 21%), plans for nutrition (four patients = 10%), plan for mobilisation (five patients = 12%) and management of pain (one patient). In the group with a documented diagnosis of delirium, 14 patients (78%) had a plan to optimise care. In the group where the diagnosis was missed, only 12 (60%) had a plan to increase care (Figure 3).

Create a calm and stable environment

Eleven of the 38 delirious patients (29%) had a complete plan for reducing the level of stress. The missing items were plan for moving the patients to a quiet environment (23 = 61%), extra nursing resources (18 patients = 47%), documentation of whether the patients used eye-glasses or hearing aids (23 patients = 55%) or both, documented plan for securing sleep (14 patients = 37%). When comparing patients with or without a diagnosis, eight (44%) patients with a diagnosis had a complete plan for creating a calm and stable environment. This was the case in only three patients (15%) in whom the diagnosis was missed (Figure 3).

Regarding the RASS results, we showed that approximately half of the delirious patients had no psychomotor disturbances. Nine of the 15 patients with a RASS = 0 were in pharmacological treatment for agitation (Figure 4).

DISCUSSION

The study shows that delirium is severely underdiagnosed. This is in agreement with the findings reported in other studies. A study from 2001 found that the symptoms of delirium were not recognised, and that various alternative diagnostic descriptions were applied, for example, dementia or depression [20].

Pharmacological treatment

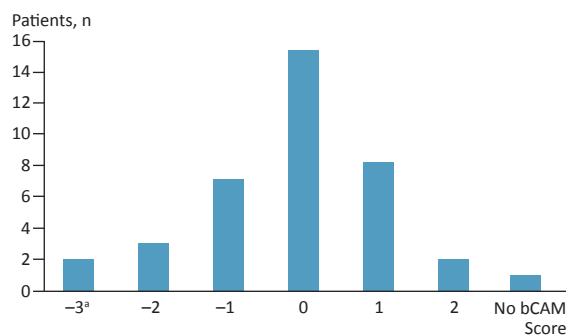
Pharmacological treatment of a delirious patient's agitation can be a precondition to the treatment and care of the patient's underlying disease. Thus, it was encouraging that pharmacological treatment with haloperidol for agitation had been considered in the patients' charts in most cases. Thus, the diagnosis of delirium is an important and determining factor that makes it necessary to consider the pharmacologic treatment of agitation.

Non-pharmacological interventions

Considering non-pharmacological interventions, the results showed that these were insufficiently documented. As stressed above, diagnosis of delirium seems to be important in order for nurses to intervene non-pharmacologically. It is surprising that observations by nurses regarding constipation, nutrition and mobilisation were not documented for all patients. In this study, no information was collected in the non-delirious group. It is therefore

FIGURE 4

The Richmond Agitation Sedation Scale (RASS) score in delirious patients, number of patients. Approximately half of the patients with delirium had a RASS of 0 (calm and cooperative), and hypoactive delirium was seen in 12 patients. No RASS score was recorded in the patient who refused the Brief Confusion Assessment Method (bCAM) and found delirious by the psychiatrist.



a) Responsive to verbal stimulus, patients with RASS < -3 are non-assessable with bCAM.

diagnosis was documented or not varied greatly from ward to ward. One ward (Orthopaedic Surgery) had identified five of five (100%), while two other wards (Infectious Diseases and Pulmonary Medicine) had identified three of ten (30%).

Pharmacological treatment of agitation

A total of 18 of 38 delirious patients (47%) had a treatment plan for agitation that included haloperidol. No other antipsychotic drug was prescribed. Among these, 16 patients (89%) with a documented diagnosis of delirium received pharmacological treatment for agitation compared with two patients (10%) in whom no diagnosis was documented (Figure 3).

Optimising care

Among the 38 delirious patients, 26 (68%) had a plan to increase care that included all items. Eight (21%) of the 38 delirious patients did not have a completed plan: The missing items were observation of constipation (eight

not possible to determine whether this is a specific finding in the delirious group or a general problem.

CONCLUSIONS

Delirium is a very common phenomenon in a Danish acute hospital setting. Both the identification and treatment of the condition are inadequate. However, the diagnosis of delirium seems to be a decisive factor for both pharmacological and non-pharmacological interventions. Our study emphasises this as patients with a diagnosis of delirium more frequently received pharmacological treatment for agitation, optimised care and stress reduction than patients who did not have a documented diagnosis. To change this, efforts must be made to increase the knowledge of delirium among healthcare workers. Efforts should include the introduction of systematic delirium screening using bCAM or another validated tool. bCAM is easy to use, also for nurses, and takes about 3-5 minutes to perform. Furthermore, delirium prevention and treatment should be placed high on the agenda of both health organizations and patient associations.

The Danish National Health authorities have recently taken the first step by forming a committee with the purpose of drafting a national guideline for the detection, prevention and treatment of organic delirium.

CORRESPONDENCE: Jens Nørbaek. E-mail: jens.noerbaek@regionh.dk

ACCEPTED: 26 August 2016

CONFLICTS OF INTEREST: Disclosure forms provided by the authors are available with the full text of this article at www.danmedj.dk

ACKNOWLEDGEMENTS: The authors would like to extend our gratitude to Torben Mogensen, Hvidovre Hospital, Denmark, and Pia Glyngdal, Psychiatric Center Hvidovre, Denmark, for their assistance and encouragement.

LITERATURE

- Pisani MA, Kong SY, Kasl SV et al. Delirium and mortality in older ICU patients. *Am J Respir Crit Care Med* 2009;180:1092-7.
- Meagher D, Moran M, Raju B et al. A new data-based motor subtype schema for delirium. *J Neuropsychiatry Clin Neurosci* 2008;20:185-93.
- Davis D, MacLulich A. Understanding barriers to delirium care: a multi-centre survey of knowledge and attitudes amongst UK junior doctors. *Age Ageing* 2009;38:559-63.
- Collins N. Detection of delirium in the acute hospital. *Age Ageing* 2010;39:131-5.
- Svenningsen H. Dansk scoringsredskab til vurdering af intensiv delir. Oversættelse og validering af CAM-ICU. Aarhus University, 2006. www.researchgate.net/profile/Helle_Svenningsen/publication/267383973_Masterprojekt_Dansk_scoringsredskab_til_vurdering_af_intensiv_delir_Oversaettelse_og_validering_af_CAM-ICU_af_links/5526af8f0cf2520617a69c7f.pdf (1 Nov 2015).
- Inouye SK. Delirium in older persons. *N Engl J Med* 2006;354:1157-65.
- Dasgupta M, Brymer C. Prognosis of delirium in hospitalized elderly: worse than we thought. *Int J Geriatr Psychiatry* 2014;29:497-505.
- Pandharipande P, Girad TJ, Jackson JC et al. Long-term cognitive impairment after critical illness. *N Engl J Med* 2013;369:1306-16.
- Davis D, Muniz Terrera G, Keage H et al. Delirium is a strong risk factor for dementia in the oldest-old: a population-based cohort study. *Brain* 2012;135:2809-16.
- Lakatos BE, Capasso V, Mitchell MT et al. Falls in the general hospital: Association with delirium, advanced age, and specific surgical procedures. *Psychosomatics* 2009;50:218-26.
- Leslie DL, Marcantonio ER, Zhang Y et al. One-year health care costs associated with delirium in the elderly population. *Arch Intern Med* 2008;168:27-32.
- Page J, Ely EW, Gates S et al. Effect of intravenous haloperidol on the duration of delirium and coma in critically ill patients (Hope-ICU): a randomised, double-blind, placebo-controlled trial. *The Lancet Resp Med* 2013;1:515-523.
- Pandharipande P, Ely EW. Sedative and analgesic medications: Risk factors for delirium and sleep disturbances in the critically ill. *Crit Care Clin* 2006;22:313-27.
- Loneragan E, Luxenberg J, Areosa Sastre A. Benzodiazepines for delirium. <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD006379.pub3/abstract> (1 Nov 2015).
- Lundström M, Edlund A, Karlsson S et al. A multifactorial intervention program reduces the duration of delirium, length of hospitalisation, and mortality in delirious patients. *J Am Geriatr Soc.* 2005;53:622-8.
- Inouye S. A multicomponent intervention to prevent delirium in hospitalized older patients. *N Engl J Med* 1999;340:669-76.
- Benjaminsen, S. Delirium in older, hospitalized patients is common and is associated with a poor outcome. *Ugeskrift Læger* 2014;176:V01130084.
- Han J, Wilson A, Vasilevskis EE et al. Diagnosing delirium in older emergency department patients: Validity and reliability of the Delirium Triage Screen and the Brief Confusion Assessment Method. *Ann Emerg Med* 2013;62:457-65.
- Inouye SK van Dyck CH, Alessi CA et al. Clarifying confusion: The Confusion Assessment Method: A new method for detection of delirium. *Ann Intern Med* 1990;113:941-8.
- Inouye SK Foreman MD, Mion LC et al: Nurses' recognition of delirium and its symptoms. Comparison of nurse and researcher ratings. *Arch Intern Med* 2001;161:2467-73.