

Prevention of delirium in the elderly

Kees Kalisvaart, MSc RN, and Ralph Vreeswijk, MSc RN MD PhD

Medical Centre Alkmaar. Geriatric Department. Alkmaar. Holanda.

The incidence of delirium in the elderly in general hospitals is up to 20 to 65%. Delirium is associated with high mortality, increased morbidity, increased need for nursing surveillance, longer hospital stays and a high rate of institutionalization following discharge. Delirium is not recognized by clinicians in one- to two-thirds of all cases and is commonly overlooked or misattributed to dementia, depression, or senescence; confusional states in the hospitalized elderly are considered the rule, rather than the exception and cognitive function is rarely assessed.

For prevention of delirium it is necessary to look for patients "at-risk" for delirium and to use instruments for screenings and severity. Also should the medical and nursing staff be made aware of prodromal symptoms for delirium, indicating a delirium is developing. Prevention requires multidisciplinary action with pharmacological and non pharmacological interventions (multifactor intervention). A pro-active consultation team (doctors and nurses) resulting in good basic medical- and nursing care have the best results concerning the prevention of delirium, reducing delirium incidence with more than 25%.

Key words

Delirium. Prevention. Interventions. Instruments. Haloperidol. Risk-assessment.

Prevención del delirium en los ancianos

La incidencia del delirium en los ancianos atendidos en hospitales generales es del 20-65%. El delirium se asocia a una mortalidad elevada, un incremento de la morbilidad, una necesidad mayor de vigilancia por parte de los profesionales de enfermería, estancias hospitalarias más prolongadas y una elevada tasa de institucionalización tras el alta hospitalaria. Sin embargo, el delirium no es reconocido por los clínicos en la tercera o las dos terceras partes de todos los casos y a menudo se pasa por alto o se atribuye erróneamente a demencia, depresión o envejecimiento; en los ancianos hospitalizados, los estados de confusión son considerados la norma —más que la excepción— y no es frecuente que se lleve a cabo la evaluación de la función cognitiva.

Para la prevención del delirium es necesario evaluar a los pacientes «con riesgo» de delirium y utilizar los instrumentos adecuados para detectar este problema y determinar su gravedad. Por otra parte, tanto los médicos como los profesionales de enfermería

deberían conocer los síntomas prodrómicos del delirium que indican la aparición inminente de este trastorno. La prevención requiere la aplicación de una estrategia multidisciplinar con intervenciones farmacológicas y no farmacológicas (intervención multifactorial). Los mejores resultados en la prevención del delirium, con una reducción en la incidencia de este trastorno superior al 25%, se han conseguido mediante la participación de un equipo de consulta (médicos y profesionales de enfermería) dedicado especialmente a este problema, con aplicación de una asistencia médica y de enfermería óptima.

Palabras clave

Delirium. Prevención. Intervenciones. Instrumentos. Haloperidol. Evaluación del riesgo.

Hospitals do not acknowledge the fact that delirium within the elderly is a major problem. Most times they do not have a policy regarding the problem and there is a lack in expertise about delirium in the elderly. Knowledge about the subject and the use of instruments is low not only among doctors but also among nurses. And most times they need the expertise of a geriatrician, psychiatrist or a specialised nurse.

The incidence of delirium in the elderly in general hospitals is up to 20 to 65%. Delirium is associated with high mortality, increased morbidity, increased need for nursing surveillance, longer hospital stays and a high rate of institutionalisation following discharge. The burden for patients, families and nursing staff as well as economic costs are enormous. Furthermore, delirium in the elderly is characterized by a more prolonged persistence of cognitive symptoms 6 to 12 months after hospitalization. Thus, additional costs are incurred as a result of rehabilitation services, nursing home placement, and home care. The proportion of older people in hospital is growing and will account, for almost half of all inpatient days in the near future. As a result the incidence of delirium will also rise steeply the coming years.

Despite the high prevalence of delirium, the severity of the clinical implications and the high economical burden, it has attracted little attention from clinical researchers and almost no attention at all from health care management, insurance companies and governmental agencies.

Previous studies suggest that a 25% reduction of delirium can be achieved with simple preventive measures,

Correspondencia: Sr. Ralph Vreeswijk.
Medical Centre Alkmaar. Geriatric Department.
Wilhelminalaan 12. 1815JD Alkmaar. Holanda.
Correo electrónico: r.vreeswijk@mca.nl

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such as decreased use of psychoactive medications, treatment of dehydration and early mobilization, with substantial cost savings¹. Delirium serves as an indicator of how hospital care is failing older patients, due to iatrogenesis, overmedication, failure to carry out proper geriatric assessments, reduction in skilled nursing staff, rapid pace of care and poor attitudes towards care of elderly patients. Examining delirium provides an opportunity to improve the quality of hospital care for older persons in more general terms².

In comparison to the fields of research on depression and dementia, the research activity focusing specifically on delirium is relatively small. There are many white spots and there is very little knowledge on basic aspects of delirium. Especially in clinical practice it is clear that, despite of clinical guidelines, most of the 'golden standards' for the assessment, prevention and treatment of delirium are based on clinical experience rather than firmly established clinical evidence³.

Delirium is not recognized by clinicians in one- to two-thirds of all cases. The reasons for this failure to recognize this serious clinical condition are complex and manifold, including failure to appreciate that delirium is a potential medical emergency and that it is often the first, and sometimes the only, sign of serious underlying illness, such as pneumonia, sepsis, or myocardial infarction, in older patients. Delirium is commonly overlooked or misattributed to dementia, depression, or senescence; confessional states in the hospitalized elderly are considered the rule, rather than the exception and cognitive function is rarely assessed⁴. Moreover, characteristics of the delirium itself, such as its fluctuating nature, lucid intervals, and predominance of the hypoactive form in the elderly, make its recognition more difficult. Varying definitions of delirium do not make things easier. Two influential diagnostic classification systems exist. The Diagnostic and Statistical Manual for Mental Disorders (DSM) criteria of the American Psychiatric Association, with revised versions over the last decade (DSMIII, DSM-III-R, DSM-IV and DSM-IV-TR) and The International Classification of Diseases (ICD) versions 9 and 10. Although differences between the systems appear to be small, some studies have pointed out that these differences can lead to diverging results on the recognition and diagnosis of delirium⁵. The use of assessment scales for the recognition and diagnosis of delirium based on these classification systems must be evaluated with this in mind, especially when used for research purposes. Much early work on delirium has been done with no clear concept of valid delirium scales at all, making interpretation of existing data very hard indeed. Some of the work on assessment scales was either not available in different translations, or not validated for use in different populations, while the use of rating scales can be helpful in detecting delirium and in measuring symptom severity.

DELIRIUM SCREENINGS AND SEVERITY SCALES

In a systematic review 13 scales were examined. Out of seven similar rating scales the Confusional Assessment Method (CAM), NEECHAM en Delirium Observation Scale (DOS) appear to be most suitable as a screening instrument for the diagnosis of delirium, depending on the type of raters (physician or nurse). The revised Delirium Rating Scale (DRS-R-98) that is rated by either physicians or trained research nurses seems to be particularly useful for measuring delirium severity or monitoring change¹⁰.

The fluctuating course of delirium symptoms over the day or even hours makes 24-hour observation and assessment of duration and severity important. Treatment decisions are based on these observations made by nurses during their shifts over the day. In the systematic review there was no severity scale found which can be used especially by nurses. In the review the Delirium O Meter (DOM) was not mentioned because at that time it was not developed. The DOM is a new rating scale for delirium-severity. It is a nurses' rating scale for monitoring delirium severity. The scale is based on the symptoms of delirium. Both the «hypo-active» and «hyper-active» symptoms were included in the scale, to allow for making distinction between these subtypes of delirium. In practice the DOM performs well in measuring the severity of delirium by nurses¹³.

RISK-ASSESSMENT AND PREDICTION OF DELIRIUM

Much research work has been done to identify risk factors for delirium. Since the etiology of delirium is multifactorial, involving the inverse relationship between patient vulnerability, predisposing factors on admission and the severity of noxious insults and aggravating factors and precipitating factors during hospitalisation, it has been tried to combine the most important factors into a predictive model. Only one model had been validated in another population than the development cohort: the Inouye et al. model¹¹, developed in a medical population and did not include post-surgery patients.

Risk factors

Several risk factors have been identified. In several studies more than 60 predisposing and precipitating risk factors have been found.

PRODROMAL SYMPTOMS OF DELIRIUM

In clinical practice and also in a few studies attention is drawn towards symptoms patients have before the diagnosis of delirium is made. These early symptoms can consist

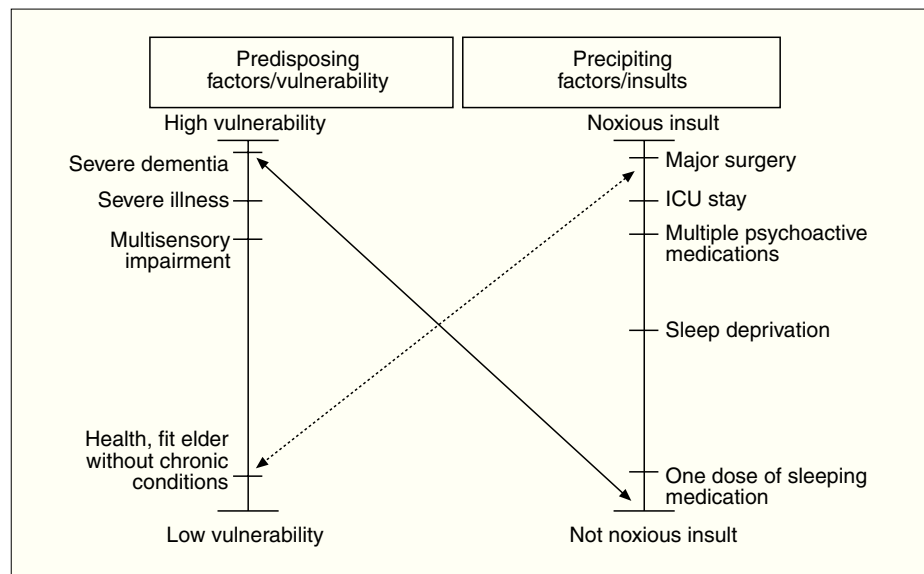


Figure 1. Multifactorial model of delirium. Imouye, 1996.

of a variety of symptoms, psychological and motor, but not the pathognomonic symptom of clouding of consciousness (yet). The nursing staff often reports especially

Table 1. Predisposing causes for delirium

Demographic and social factors
Older age
Male gender
Institutional setting
Social isolation*
Process of care
iatrogenesis
Inadequate skills in recognition of delirium
Negative attitudes toward the care of the elderly
Rapid pace and technological focus of acute care
Reductions in skilled nursing staff
Special sensory impairment
Visual impairment
Hearing impairment
Cognitive and psychiatric comorbidity
Dementia
Degree of stage of dementia
Late onset Alzheimer's dementia
Vascular dementia
Cognitive impairment*
Depression*
Functional impairments and disability
Functional dependence
Immobility
Fracture on admission
Malnutrition
Dehydration
Alcoholism
Medical comorbidity
High burden of illness
Previous stroke
Parkinson's disease
Azotemia

*Independent associations are bolded.

wild and vivid dreams, restlessness, orientation disturbance and tiredness. Even days before formal criteria of postoperative delirium were met, patients who developed a frank delirium later on were already experiencing problems with the sleep-wake cycle, perception, thinking, psychomotor changes, orienting, concentrating and memory (DRS-R-98). Most patients with postoperative delirium already have early symptoms in the prodromal phase of delirium. These prodromal symptoms are potentially useful for screening purposes and for optimizing prevention strategies targeted at reducing the incidence of postoperative delirium¹².

PRIMARY PREVENTION OF DELIRIUM

Some work is done on influencing the risk factors to prevent delirium or to prevent the worsening of delirium once it has occurred. In a review involving a systematic search of MEDLINE, the Cochrane- and CINAHL Databases and subsequent examining of reference lists about primary prevention of delirium based on non pharmacological interventions, only six studies found⁸.

Not all the researchers used the same criteria for the diagnosis of delirium and the studies were done in different populations and often not very well controlled. Despite the methodological weaknesses of most of the studies, several different kinds of interventions to prevent delirium are effective in practice. Systemic interventions regarding medical, nursing, environmental and educational items were effective in preventing delirium in those studies. They showed a reduction of 3% to 18% in delirium. In a large study about prevention of delirium in elderly hip surgery patients done in the Netherlands there was use of a Best Supportive Care protocol for the prevention of deli-

Table 2. Precipitating causes for delirium

Medications
Substance withdrawal
Alcohol
Sedative hypnotics
Substance intoxication
Sedative hypnotics
Narcotics
Anticholinergics
Antipsychotics
Antiparkinsonians
Antidepressants
Severe acute illness infections
Urinary tract infections
Pneumonia
Metabolic abnormalities
Hyperglycemia/hypoglycemia
Hypercalcemia/hypocalcemia
Thyrotoxicosis/myxedema
Adrenal insufficiency
Hepatic failure
Renal failure
Hypernatremia/hypokaliemia
Hypoperfusion states and pulmonary compromise
Hypoxemia
Shock
Anemia
Congestive heart failure
Chronic Obstructive pulmonary disease
Urinary and fecal retention*
Environmental/psychological contributors
Sensory deprivation
Sensory overload
Psychological stress
Sleep deprivation
Pain
Physical restraint use
Bladder catheter use
Any iatrogenic event
Intensive care unit treatment
Surgery, anaesthesia and other procedures
Orthopedic surgery
Cardiac Surgery
Duration of cardiopulmonary bypass
Non cardiac surgery
High number of procedures in hospital
Neurological illness
Subdural hematoma
Stroke
Malignancy
Cerebral infection
Seizures

*Independent associations are bolded.

rium. This protocol was developed out of the scientific research which was already done. The protocol consisted about advises on aspects of orientation, sleep, pain, food and fluid intake, information to family and aspects of education of care towards nursing staff. During this study there was a reduction of delirium of more than 25%.

A multifactor intervention is the best way for the prevention of delirium, and a pro-active consultation team (doctors and nurses) seems to have the best results con-

cerning the prevention of delirium.

GOLD STANDARD

Since long there was a feeling among physicians in the Netherlands that, when the risk of developing delirium mounts up to almost a 100% in specific groups of patients, e.g. those with severe dementia and a hip-fracture, it might be advisable to start with the «gold standard» treatment on admission to the hospital instead of waiting for a frank delirium. Although solid evidence of controlled studies is lacking, haloperidol is used as the treatment of first choice.

In a review found in Chochrane about Interventions for preventing delirium in hospitalised patients by Siddiqi et al.⁷ (2007) there were only two studies mentioned with a quality assessment of A. These studies were done by Marcantonio 2001 and Kalisvaart 2005. Only Kalisvaart's study was a medical trial (RCT) about haloperidol prophylaxes for the prevention of delirium⁹. In this study a total of 430 hip-surgery patients aged 70 and older at risk for postoperative delirium were randomized, double blind, in a placebo-controlled trial. Haloperidol 1.5 mg/day or placebo was started preoperatively and continued up to 3 days postoperatively. Pro-active geriatric consultation was provided for all randomized patients.

The primary outcome of the study was the incidence of postoperative delirium (DSM-IV and Confusion Assessment Method criteria). Secondary outcomes were the severity of delirium (Delirium Rating Scale revised version-98), the duration of delirium and the length of hospital stay. The overall incidence of postoperative delirium was 15.7%.

The percentage of patients with postoperative delirium in the haloperidol and placebo treatment condition was 15.1% vs 16.5%. the severity of delirium as reflected by the mean of the highest DRS-R-98 score for each episode with delirium was 14.4 in patients receiving prophylaxis vs 18.4 in patients with placebo. Also the delirium duration was much shorter with haloperidol prevention: 5.4 vs. 11.8 days and the mean number of days in the hospital for both groups was 17.1 vs 22.6. No haloperidol-related side effects were noted. The conclusion of this study was.

Low-dose haloperidol prophylactic treatment demonstrated no efficacy in reducing the incidence of postoperative delirium. It did have a positive effect on the severity and duration of delirium. Moreover, haloperidol reduced the number of days patients stayed in the hospital, while the therapy was well tolerated.

CLINICAL IMPLICATIONS

As cited above, Inouye has described the high incidence of delirium as a prototypical symptom of the weaknesses in our current hospital care, combining iatrogenic

nic incidents, overmedication, failure to carry out proper geriatric assessment, reduction in skilled nursing staff, rapid pace of care and poor attitudes towards care of elderly patients. Although this picture is sombering it also offers a perspective on opportunities to improve the quality of hospital care for older people. By simply providing a good standard of basic care we can prevent some deliria and reduce overall delirium incidence in our hospitals. When educating students or nurses on the subject of prevention of delirium the standard reaction is always: «this seems such basic normal care». With the increasing number of old and above all frail patients in hospital, the first thing to do is provide good normal care.

The use of a model for predicting delirium in patients by forming 'at-risk' groups on the basis of higher vulnerability gives us the opportunity to provide extra, high cost care to those who really need it.

The assessment of the early symptoms in the prodromal phase of delirium may result in earlier diagnosis, because physicians as well as nursing staff will become more focused on detecting delirium. Furthermore it is potentially useful for screening purposes and for optimizing prevention strategies targeted at reducing the incidence of postoperative delirium.

The construction and implementation of a best-supportive care program makes it possible to provide the best possible care for patients either at risk for or with incident delirium. The program requires the use of cognitive and delirium assessment scales, even when administering these instruments imposes costs and changes routine in the hospital. The scales are easy to use, reliable, validated and translated into several languages.

The construction of the Delier-O-Meter provides a good tool for nurses to follow the patient with delirium and detect change, both in severity and form of the delirium over the day. It takes very little time to administer. In one glance it provides a different picture of patients who are 'confused' and it completes insight in how patients have been over the last days'. In daily practice it seems to result in more adequate use of psychoactive drugs and of restraining devices.

The implementation of the best-supportive care program resulted in a decrease in incidence of delirium. The reduction in complications, related medical costs, and the duration of hospital admission resulting from a reduction of delirium severity, can be expected to be significant too. Haloperidol prophylaxis has an effect on severity and duration, which is in itself very important. For daily practice it is recommended to use low-dose of haloperidol for the prevention of delirium in patients at high risk for delirium.

This concentration of preventive strategies should become part of normal practice for all elderly.

FUTURE RESEARCH

More research is needed on all fronts of delirium. Continuing research into the conceptualisation of delirium is needed, because it is by no means clear that the current diagnostic constructs in ICD-10 and DSM-IV fully capture the unique, defining aspects of this disorder, especially in relation to dementia. More work on aetiology and pathogenesis will lead to better understanding of how all these totally different predisposing and precipitating factors can lead to such a complicated syndrome of delirium. Sophisticated models are probably needed to help to decide which possible causal factors are there to be influenced first to get a 'cure' for delirium that can replace all the symptomatic treatments of today. There is still much work to be done on improving the understanding of the psychometric properties of delirium rating scales. One important issue that is still insufficiently appreciated is that concepts such as validity and reliability are not inherent attributes of scales, but functions of the context in which they are used. If researchers are using an instrument in a population that is substantially different from that in which the instrument was developed, they need to show that it is suitable to be used in their specific studied patient sample.

The validation of measures of change is difficult and complex. More work has to be done on this issue. In general, research into the specific symptoms (such as attention) of delirium will require the development of more sophisticated measures than are currently available, and this development will in turn need to be grounded in more detailed study of delirium phenomenology, including its fundamental neuropsychological characteristics. Better measures of specific symptoms (as we did with our work on early symptoms) will contribute to our reliability to identify patients in the earliest stages of delirium. Prevention and risk-assessment need refining and testing in other more specific populations. Research should have longer follow-up periods and shorter intervals between assessments to characterize better the course of delirium, e.g. in the course of depression and dementia. And to get a better understanding of the long-term outcomes. Still there is very little knowledge about the relation between delirium and dementia. The evidence base for effective management strategies is still very limited; indeed, it is non-existent for some important groups, such as delirium in the elderly with cognitive impairment⁶. Treatment programs (medical, pharmacological, social and psychological) must be studied in all populations by means of randomised, controlled trials. The concept of education—changing the knowledge, skills, and attitudes of staff—needs to be extended to the whole system that deals with delirious older people.

CLOSING REMARKS

Delirium is a very common problem in the elderly. But only a few are researching this subject. This does not seem

right in respect to this syndrome being one of the «geriatric giants». Delirium research deserves a more prominent place on the academic agenda. However, to get more knowledge on diseases it is of the utmost importance that every physician is willing to play a part in research. Even by 'only' constantly monitoring and evaluating our work we provide material for answering some of the existing questions. This study shows that, with affordable means, patient research is perfectly possible in a large, non-academic, hospital. Affiliations with medical schools are very helpful and provides a good basis for working.

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