Delirium is characterized by an acute state of confusion that is transient and fluctuates over the course of a day. It is associated with disturbances of consciousness, attention, cognition, and perception. It may further be manifested by abnormal sleep patterns, alterations in psychomotor behavior, and language or perceptual disturbances. Delirium is a common, but often overlooked syndrome in the elderly. If left misdiagnosed or untreated, it can have a significant impact on the well-being of the older population. The nursing home environment serves as a particularly vulnerable setting, thereby accentuating the need for education to enhance the detection and subsequent therapeutic treatment of delirium.

The prevalence of delirium in hospitalized patients ranges from 10 to 30% with even higher occurrence among those with postoperative and cancer diagnoses (Smith et al., 1995). Even more alarming is that an estimated 15 to 26% of elderly patients with delirium die, usually due to the underlying pathologic process (Espino et al., 1998). The etiology of delirium is multi-factorial, complex, and poorly understood by many healthcare providers. Yet it is considered a medical emergency and early recognition of symptoms correlates with most favorable outcomes for patients (Chan and Brennan, 1999). Unfortunately, due to its broad spectrum of signs and symptoms, delirium is often misdiagnosed as a psychosis, depression, or dementia. Subsequently, it may be overlooked or go mistreated. Patients who develop delirium during hospitalization are more likely to be admitted to a long-term care facility after discharge (Rapp, 1998). The prevalence of delirium in nursing home residents is not well documented, although nurses working in the long-term care setting indicate it is a fairly common occurrence (Mentes, 1995).

Consequences

The consequences of delirium are high morbidity and mortality, along with an enormous financial burden for the healthcare system. More specifically, delirium is responsible for increased length of hospital stays, increased nursing care, decreased ability to function, delayed rehabilitation, and more frequent institutionalization (Fick and Foreman, 2000). While the majority of patients recover, full recovery by the elderly is estimated at only 4 to 40% by the time of discharge from a hospitalization per year (Practice Guideline, 1999). Although the data on health outcomes are of greatest concern, the financial implications are staggering. It has been reported that delirium involves more than 17.5 million inpatient days and over $4 billion (in 1994 dollars) of Medicare expenditures (Inouye et al., 1999). Improving the chance for full recovery relies on early detection and appropriate management of delirium.
Pathophysiology

The pathophysiology of delirium is poorly understood. According to Smith et al. (1995), delirium involves widespread metabolic cerebral dysfunction. It may be the result of a global, nonspecific disorder of brain function as the result of systemic processes such as acid-base imbalances, hypoxia, hypotension, or hypothermia. Another view proposes that delirium is caused by cerebral oxidative metabolism resulting in the reduction of acetylcholine synthesis (Mentes, 1995). This finding has been substantiated by Lipowski (Mentes, 1995) through studies that demonstrated the inducement of delirium following administration of anticholinergic agents. Still another theory hypothesized by Kral (Mentes, 1995) proposes delirium is the result of elevated plasma cortisol levels brought on by acute stress.

Causes and Risk Factors

Causes of delirium are usually multiple in origin. Mentes (1995) refers to categorizing causal factors of delirium by systemic, mechanical, and psychosocial-environmental factors. In this categorization, systemic causes are those that alter brain metabolic processes such as infections, drug toxicity, elimination problems, or electrolyte imbalances. Mechanical causes are conditions that block or restrict normal brain function such as vascular obstruction due to cardiac dysfunction, brain trauma, cardiovascular accident, or cancer. Psychosocial-environmental causes refer to external, non-biologic factors that impact a person’s well-being. This category includes factors such as sensory deprivation or overstimulation, personal losses, and age-associated physiologic and psychosocial changes. Chan and Brennan (1999) report that medications are the most common reversible cause of delirium, accounting for 22 to 39% of all cases. Schuurmans et al. (2001) corroborate this finding by noting that medication toxicity, dehydration, and other metabolic disturbances are the most frequent causes of delirium in older hospitalized patients. Inouye and Charpentier (1996) support the hypothesis that delirium is multi-factoral, resulting from the complex interrelationship between predisposing factors and precipitating factors.

It is commonly accepted that certain patient populations are more predisposed to the development of delirium. Advanced age is one of the most significant risk factors, with an age of 80 or older being at greatest risk (Weinberger and Carnes, 1997). Another significant risk factor is the presence of existing baseline cognitive impairment. A patient with dementia has a two to three times greater risk of developing delirium than a patient with normal mental status (Shua-Haim et al., 2000). Additional risk factors include hypothermia, low serum albumin, visual impairment, limited social interactions, and multiple prescription medications (Chan and Brennan, 1999).

Clinical Presentation

Essential clinical criteria for delirium are outlined by the American Psychiatric Association’s Diagnostic and Statistical Manual of Mental Disorders, DSM-IV. As outlined by Jacobson and Schreibman (1997), these criteria include:

- Disturbance of consciousness (i.e., reduced clarity of awareness of the environment) with reduced ability to focus, sustain, or shift attention;
- A change in cognition (e.g., memory deficit, disorientation, or language disturbance) or the development of a
perceptual disturbance that is not better accounted for by a pre-existing, established, or evolving dementia;

▲ A disturbance develops over a short period of time (usually hours to days) and tends to fluctuate during the course of the day; and

▲ Evidence from the history, physician examination, or laboratory findings that the disturbance is caused by the direct physiologic consequences of a general medical condition.

Most sources recognize two subtypes of delirium, those being the hyperactive type or the hypoactive type, while others also include a “mixed” delirium. According to the Practice Guideline for Treatment of Patients with Delirium (1999), the hyperactive type is characterized by hallucinations, delusions, agitation, and disorientation. In contrast, the hypoactive form is manifested by confusion and sedation with infrequent involvement of hallucinations, delusions, or illusions. Often, a patient may revert from one state to another within the course of a delirious episode. Hyperactive delirium is often linked with withdrawal syndromes and anticholinergic-induced onset, while hypoactive delirium is usually associated with metabolic and hepatic encephalopathies, acute intoxications, or hypoxia (Smith et al., 1995).

The clinical features of delirium cover a broad spectrum of signs and symptoms. Delirium occurs most commonly in the late afternoon and is characterized by a rapid onset of hours to days (Sandberg et al., 1999). However in a study by Sandberg et al. (1999), 315 out of 717 patients with delirium manifested the symptoms only 37% of the time in the afternoon, evening, or night and 47% experienced delirium in the morning. Weinberger and Carnes (1997) state that symptoms tend to fluctuate during the course of the day and are most severe at night. They additionally report that a high percentage of patients experience a prodromal period where sleep abnormalities in the form of vivid dreams, nightmares, and/or sleep-wake cycle disruptions occur.

In addition to the manifestations described previously, patients may suffer from impairment of memory in the form of registration, retention, and recall, with many of the patients remaining amnesic of the episode following recovery from the delirium (Weinberger and Carnes, 1997). Language almost always is abnormal with speech being slurred, rambling, and/or incoherent. Usually, the patient is disoriented to time and place, but rarely to person. Finally, psychomotor activity may be either reduced or increased. The hyperactive form is associated with diaphoresis, tachycardia, flushing, and tremors along with disruptive behavior. In contrast, patients with hypoactive delirium are often seen as depressed, uncooperative, or sleepy.

**Lack of Recognition by Caregivers**

Despite its life-threatening potential and frequent occurrence, delirium is often misdiagnosed or attributed erroneously to the aging process, dementia, or a normal progression of a preexisting illness. According to Inouye, Schlesinger, and Lydon (1999), delirium is unrecognized by the clinicians caring for the patient one-third to two-thirds of the time. Recognition of delirium when superimposed on dementia creates an even greater recognition problem. In a study by Fick and Foreman (2000), failure to recognize delirium in dementia patients was a recurrent problem for both physicians and nurses.
There are multiple reasons that healthcare providers fail to recognize delirium. Knowledge and awareness of delirium has been hindered by the use of vague terminology within the medical community, need for useful and uncomplicated diagnostic tools, and preconceived notions by healthcare providers about the aging process.

Because nurses are the front-line caregivers 24 hours a day, 7 days a week, they are in the best position to detect subtle changes in patient’s mental status. Schuurmans et al. (2001) cite numerous studies indicating that nurses are the most likely caregivers to recognize delirium. Yet, awareness and understanding of delirium by nurses is minimal at best. This fact is evidenced through the many studies reviewed by Schuurmans et al. These studies indicate disorientation is detected best by nurses, however detection of other symptoms such as sleep disturbances, abnormal psychomotor activity, perceptual problems, or language disturbances is inconsistent. In another cited study by McCarthy (Schuurmans et al., 2001), it was found that the ability to recognize acute confusion was influenced by the philosophical attitude of the nurse about healthy aging. Lastly, lack of a thorough patient assessment by both physicians and nurses contributes to the poor detection of delirium. One study (Fick and Foreman, 2000) found that observation and documentation of mental status by providers was minimal. The study revealed that providers spent little time with patients, failed to acknowledge family input regarding mental status, and did not recognize changing mental function. Hence, it appears that accurate detection of delirium is contingent on better education and training of caregivers. Educational emphasis should be given to the causes and risk factors of delirium, use of clear and consistent terminology regarding mental status, and knowledge of the normal aging process. Additionally, consideration should be given to the routine use of screening or evaluation instruments to assist in the detection and ongoing monitoring of delirium.

Screening Instruments

There are multitudes of screening or evaluation tools that are helpful in the assessment for delirium. Since tests vary in length, complexity of administration, and reliability and validity, discussion here will center on those identified as most valuable for identification of delirium. Instruments are primarily classified into cognitive screening tests, delirium rating scales, and diagnosis tools. Some of these instruments are more reliable in the detection of delirium than others and each type of instrument has its own benefits and limitations.

The most widely accepted and utilized cognitive screening instrument is the Mini Mental Status Exam (MMSE). It includes eleven simple questions, including two written answers that assess the patient’s orientation, instant recall, short-term memory, language, calculation, and constructional abilities (Smith et al., 1995). Its advantages are that it can be conducted in less than 10 minutes and is easily administered (Weinberger and Carnes, 1997). These authors identify the disadvantages as its relative insensitivity to mild cognitive impairments, its inability to distinguish between delirium and dementia, and its limited value with patients with minimal education (Smith et al., 1995). Other recognized cognitive instruments include the Cognitive-Capacity Screening Examination (CCSE), the Blessed Orientation-Memory-Concentration Test (BOMC) and the Short Mental-Status Test.
While utilized less frequently, these instruments offer essentially the same benefits and limitations as the MMSE.

Delirium rating scales are instruments that help in determining the severity and symptoms of delirium and can be used to follow the course of the syndrome. The Confusion-Rating Scale (CRS) is a three-point judgment instrument developed by and for nurses that evaluates patient behavior based on four domains (Smith et al., 1995). The instrument, which is utilized each shift, evaluates orientation, communication, behavior, and presence of perceptual disturbances. The pro is that the tool is both quick and easy. The con is that validity is unknown and administration requires trained raters. Another common rating scale instrument is the NEECHAM Confusion Scale which is a nine-item observation scale with good validity and reliability (Schuurmans et al., 2001). This rating scale is a nurse-oriented instrument that facilitates rapid bedside documentation of normal functioning. Its disadvantage is that it is long and requires measurement of physical parameters. Other less frequently utilized rating instruments are the Delirium Scale (D-Scale), Delirium-Rating Scale (DRS), and the Memorial Delirium-Assessment Scale (MDAS).

Common diagnostic instruments include the Confusion-Assessment Method (CAM) and the Delirium Symptom Interview (DSI). The CAM which is based on Diagnostic and Statistical Manual of Mental Disorders (DSM-III R), is helpful in differentiating between delirium, dementia, and depression (Shua-Haim et al., 2000). It is designed to detect the four cardinal elements of delirium: acute onset and fluctuating course, disorganized thinking, inattention, and altered level of consciousness. Advantages of this tool are that it can be administered quickly with excellent validity and reliability (Smith et al., 1995). Its disadvantage is that it requires trained interviewers and although it can be administered quickly, it is valid only after first completing a thorough mental status evaluation. The DSI is a fairly common alternative but is long, somewhat difficult to administer, and also requires rater training. According to Smith et al. (1995), it detects the presence or absence of the seven criteria of DSM-III and is probably the best choice to evaluate behavioral signs associated with delirium. In summary, screening tools are an important component of detecting, monitoring, and managing delirium. Particularly in the nursing home setting, consideration should be given to the length of the instrument, the ease of administration, and the amount of required rater training. It is important to consider the shortcomings of current assessment tools in the development of an effective intervention strategy.

**Interventions**

Once delirium is recognized, appropriate interventions are necessary. Interventions essentially can be categorized into those that treat the physical symptoms or underlying causes and those that are supportive in nature. Since delirium is an acute medical emergency, initial and prompt treatment of the cause is imperative. In addition, medical care should include maintaining hydration, nutrition, and avoidance of hypothermic or hypoxic states. Close observation and monitoring of physiologic and psychosocial status including vital signs, fluid intake and output, and oxygenation should be done. All current drugs that the patient is taking should be reviewed and discontinued unless deemed absolutely necessary (Weinberger and Carnes, 1997). Anticholinergics, narcotics, analgesics, antihistamines, cardiovascular drugs, antihypertensives, and
benzodiazepines can all precipitate confusion and should be suspect (Espino et al., 1998). If excessive agitation or psychotic behavior, pharmacologic therapy may be indicated.

Most physicians agree that Haloperidol is the drug of choice (Shua-Haim et al., 2000; Weinberger and Carnes, 1997; Jacobson and Schreibman, 1997; Chan and Brennan, 1999; Practice Guideline, 1999), although the use of risperidone is increasing in frequency. Loxapine is an older atypical anti-psychotic drug that may also be helpful in the management of agitation/anxiety in delirium (McElhaney, 2002). Use of low dose benzodiazepines is controversial and most practitioners recommend administration only when delirium is associated with alcohol or sedative withdrawal (Chan and Brennan, 1999; Weinberger and Carnes, 1997). Lorazepam, oxazepam, and diazepam are cited as the most frequently utilized agents (Shua-Haim et al., 2000; Jacobson and Schreibman, 1997; Chan and Brennan, 1999; Practice Guideline, 1999).

Supportive measures are an integral component of effectively helping the patient with delirium. Creation of an optimal environment is essential. Efforts should be directed at minimizing both overstimulation and understimulation, maintaining safety, maximizing the patient’s ability to perceive the environment correctly, and creating familiarity and consistency (Jacobson and Schreibman, 1997; Shua-Haim et al., 2000; Chan and Brennan, 1999; Weinberger and Carnes, 1997). Maintaining low levels of lighting and noise is important, however it is also important to simulate a normal day-night cycle. Familiar items should be incorporated such as pictures of loved ones, personal objects, and controlled family visits. From a professional standpoint, consistency of caregivers should be maintained. Avoidance of physical restraints is recommended by all sources. To foster accurate perceptual experiences, it is important to ensure that patients utilize their eyeglasses, hearing aids, and other assistive devices.

Other supportive measures are focused at managing cognitive impairments. Jacobson and Schreibman (1997) suggest that tactics of reorientation, verification, explanation, and repetition are extremely helpful. Reorientation can be accomplished both verbally and by displaying a clock or calendar in the patient’s room. Inouye et al. (1999) studied a multicomponent intervention strategy called the Elder Life Program that was found effective in the prevention of delirium in hospitalized older medical patients. This program established protocols that address many of the delirium risk factors identified thus far including orientation, sleep enhancement, dehydration, hearing and visual impairment, and cognitive activities. Finally, attention to preventive measures such as scheduled toileting, adequate hygiene, and regular exercise are important to minimizing the occurrence of delirium (Jacobson and Schreibman, 1997).

**Summary**

Delirium is a common, yet misunderstood syndrome in the elderly. Through preventive measures and increased education regarding the causes, signs, and treatment of delirium, caregivers in the long-term care setting have the potential to significantly impact patient outcomes and reduce patient/family suffering.
References


Diagnostic medical testing in psychiatric disorders; Delirium; UPCMD Home; Psychiatry testing; University Pathology Consortium, LLC, 1998-2002.


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