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Recognizing Delirium Superimposed on Dementia:

Assessing Nurses' Knowledge Using Case Vignettes

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Abstract

Delirium is a serious and prevalent problem that occurs in many hospitalized older adults. Delirium superimposed on dementia (DSD) occurs when a delirium occurs concurrently with a pre-existing dementia. DSD is typically under-recognized by medical and nursing staff. The current study measured nursing identification of DSD using standardized case vignettes, and the Mary Starke Harper Aging Knowledge Exam (MSHAK). Results revealed that the nurses in this study had a high level of general geropsychiatric nursing knowledge as measured by the MSHAK, yet had difficulty recognizing DSD compared to dementia alone and delirium alone. Only 21% were able to correctly identify the hypoactive form of DSD, and 41% correctly identified hypoactive delirium alone in the case vignettes. Interventions and educational programs designed to increase nursing awareness of DSD symptoms could help to decrease this gap in nursing knowledge.

Delirium superimposed on dementia (DSD) occurs when a person with pre-existing dementia develops delirium. Though much research has been conducted on delirium alone, until recently little attention has been given to DSD. Delirium is common among hospitalized older adults and leads to poor outcomes (Cole & Primeau, 1993; Inouye, 2006; O'Keeffe & Lavan, 1997). Delirium is also known to be prevalent in persons with dementia (Voyer, Cole, McCusker, & Belzile, 2006). Delirium superimposed on dementia ranges from 22% to 89% in hospitalized and community-dwelling older adults (Fick, Agostini, & Inouye, 2002). Previous studies have found DSD may lead to increased rates of rehospitalization within 30 days (Fick & Foreman, 2000), an increased risk of admission to a nursing home compared to older adults with dementia or delirium alone, increased health care cost and increased health care utilization (Fick, Kolanowski, Waller, & Inouye, 2005), and higher mortality rates (Leslie, Zhang, Bogardus, et al., 2005; Leslie, Zhang, Holford, et al., 2005; Voyer et al., 2006). As increasing numbers of older adults are diagnosed with dementia, attention to preventable conditions like delirium will be crucial. The problem of DSD remains a neglected area of research.

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Despite the high incidence of delirium in the elderly population and the substantial mortality rate associated with it, it is frequently unrecognized or misdiagnosed. In several studies, delirium in approximately half of the patients went unrecognized by nurses and physicians (Inouye, Foreman, Mion, Katz, & Cooney, 2001; Laurila, Pitkala, Strandberg, & Tilvis, 2004). Nurses are at the bedside and are often the first health professionals to observe changes in mental status. When patients with a dementia do have an acute change, it may be missed, misattributed to dementia alone, or labeled as sundowning.

Recognition and early detection of delirium is a key component of delirium care and prevention. However, both the presence of dementia and the motoric subtype of hypoactive delirium have been found to be factors contributing to the under-recognition of delirium in previous studies (Inouye et al., 2001; Peterson et al., 2006). Nurse recognition and detection of delirium has been studied mostly in acute care using chart documentation or comparison with nurse researcher ratings in prospective studies (Inouye et al., 2001; Laurila et al., 2004). Present methods for assessing nurse recognition and understanding of DSD are inadequate, and the authors could find no published studies of recognition of DSD.

The purpose of this study was to assess nurse knowledge and recognition of DSD and delirium motoric subtypes using standardized case vignettes and a general test of geropsychiatric knowledge. The specific aims were:

- To describe the rate of nurse recognition of delirium and DSD including different motoric subtypes of delirium using case vignettes.
- To investigate the factors associated with nurse recognition of DSD.
- To describe nurse knowledge and management of delirium based on answers to case vignettes and a test of geropsychiatric knowledge.

The authors hypothesized that nurses would be less likely to recognize delirium in persons with dementia, and that nurse geropsychiatric knowledge of aging would correlate with correct responses on the vignettes.

METHODS

Sample

The authors used a convenience sample of nurses recruited from two medical–surgical units of an academic medical center (AMC) in the southeast United States. The AMC was a Level-1 trauma center with 478 adult beds, 154 pediatric beds, and 80 outpatient clinics that covered a 13-county area. The AMC nurse work force consisted of 996 registered nurses (325 with a bachelor's degree, 45 master's prepared), 139 licensed practical nurses, and 116 certified nurse aides and patient care assistants.

Nurses were included in the study if they worked on one of three shifts, were RNs, and attended the in-service introducing the study. Registered nurses were recruited from all three shifts and each shift was provided with food for their participation. Informed consent was obtained from all participants. One participant was excluded because of missing data, and three were later found to be telemetry technicians and thus did not meet the inclusion criteria. The results of the 29 RNs who completed the survey are presented in this article.

VIGNETTE EXAMPLE FOR DELIRIUM SUPERIMPOSED ON DEMENTIA SCENARIOS

The Case of Elizabeth: Elizabeth is a 74-year-old woman who has been in the hospital for 3 days. According to her family, she has had increasing memory problems during the past

year, and has gotten lost while driving to many familiar places where she has driven numerous times. She has also experienced increased difficulty in completing activities of daily living. Elizabeth does not seem to notice when she is spoken to and is much sleepier than usual, and falls asleep while you try to assess her. She is disoriented to time and place, and does not recognize you at all. She will not eat or take her medicines. On the fourth morning, Elizabeth will not get out of bed. She is awake, although very sleepy, and is staring blankly at the wall. She will not eat, nor does she show any interest in her food. When you attempt to assess her status, you notice that she is once again sleepier than usual, and will not remain awake during your assessment. Vital signs, physical examination, and electrocardiogram have been normal, and all lab values were within normal limits.

Design

The authors used a cross-sectional survey design and administered two measures to assess nurse knowledge of delirium in persons with dementia. Delirium identification was assessed by the use of standardized case vignettes of delirium and DSD. The case vignettes were designed to assess staff ability to identify different subtypes of delirium and DSD in a standardized format, and to gather qualitative data from the staff related to how they would manage delirium. Basic demographic data were also collected. Both the Mary Starke Harper Aging Knowledge Exam (MSHAK) and the case vignettes took less than 20 minutes to complete during pre-testing.

MEASURES

Case Vignettes: Development and Validation

The authors measured dementia and delirium recognition with five standardized case vignettes that depicted five different hospitalized patients experiencing dementia, hypoactive delirium, hyperactive delirium, hyperactive DSD, and hypoactive DSD (see Sidebar for sample vignette). The case vignettes were intended to assess staff ability to identify different subtypes of delirium and DSD in a standardized format, as well as to gather qualitative data from the staff related to how they would assess and manage delirium. This vignette approach has been applied successfully to measure variation in each health professional's approach to the recognition and management of problems including depression and other comorbid conditions (Buist et al., 2005; Veloski, Tai, Evans, & Nash, 2005).

The investigators developed the vignettes using a literature review of motoric subtypes of delirium, and they were reviewed by a geropsychiatrist. To assess feasibility (i.e., duration for completion and understandability of questions) and face validity, the vignettes were administered to four nurses. Two of the nurses were prepared above the master's degree level and had more than 10 years of direct nursing experience and advanced education in gerontology, one was an RN with fewer than 5 years' experience and no formal geriatric training, and one was a student nurse with no experience.

To assess construct validity, the vignettes were reviewed by an expert panel of four physicians and nurses who were nationally and internationally recognized experts in the field of delirium. All four experts had advanced training in geriatrics, worked with peer review publications, and had clinical expertise in geriatrics and clinical research. The four experts were sent mailed surveys and asked to independently rate the diagnosis and delirium motoric subtype (where appropriate) in each of the delirium case vignettes.

All four expert panelists completed all case vignettes. Their overall agreement on the cases was 84%, with a kappa of 0.69. For identification of delirium, motoric subtype agreement was 100% with a kappa of 1.0. Landis and Koch (1977) indicate that a kappa of 0.40 to 0.75

represents intermediate to good agreement, and greater than 0.75 represents excellent agreement beyond chance. The areas of disagreement involved one case of hyperactive DSD where two of the panelists identified the case as having a dementia but did not identify it as also having a delirium. One of the panelists stated that he did not have enough information on the acuity and fluctuation of symptoms for this case to say whether the behaviors were the acute symptoms of delirium or more chronic behaviors associated with dementia. This case was refined after the panel review to insert the wording “suddenly she is more confused...” and “this is not her usual behavior” and will undergo further validation and testing.

Case Vignettes: Application

For each vignette, the individual case symptoms and behavior were presented and the nurse respondents were asked to answer nine multiple choice and open-ended questions related to the patients’ mental status, the type of change (acute/chronic), what was happening to the patient (diagnosis or identification of delirium/dementia), whether or not they would call the physician to tell them about the behavior, and whether or not they would call the physician to request a medication. They were also asked open-ended questions related to the cause of the patient symptoms, how they would manage the problem, and what if any medications they would administer for the problem.

Geropsychiatric Knowledge

The MSHAKE tool was used as a measure of general geropsychiatric knowledge. The MSHAKE is a 25-item true–false questionnaire. It was originally developed and tested prior to the opening of the Mary Starke Harper Geriatric Psychiatry Center in Tuscaloosa, Alabama (Santo-Novak, Duncan, Grissom, & Powers, 2001). The tool asks true–false questions about dementia and complicated interactions between medical and psychiatric diseases. There are no specific questions on DSD. There were 2 of the 25 questions on delirium (i.e., “Delirium is typically an irreversible condition” and “Delirium usually has an abrupt onset”). In prior testing, the standardized alpha for internal consistency was 0.7206 on pretest and 0.7084 on posttest. Content validity was verified by gaining the opinions and suggestions of 12 nationally recognized geriatric and mental health experts (Santo-Novak et al., 2001). MSHAKE scores range from 0 to 25, with higher scores indicating better knowledge.

Statistical Analysis

Descriptive and exploratory analyses were performed to describe recognition of delirium and to assess for relationships between the case vignettes, the MSHAKE, and subject characteristics. The Cohen’s kappa was used to determine agreement between the expert panels on the DSD vignettes. Statistical significance was assessed at an alpha level of 0.05 and all statistical analyses were performed using The R Foundation for Statistical Computing Version 2.1.1 (R Core Team, 2005). Qualitative data was analyzed using content and thematic analysis (Streubert Speziale & Carpenter, 2006).

RESULTS

Nurse Characteristics

Eighty-six percent of the RN sample were women with a mean age of 40 years (range 21 to 58). Seventy-two percent of the nurses were White, 14% were African American, 3.4% were Asian, 3.4 % were Hispanic, and 6.9% indicated Other as their race/ethnicity. The majority (16 of 29, or 55%) had a bachelor’s degree (BSN), 34% had an associate’s degree (ADN), and 10% had a master’s degree. They had a mean of 14.3 years of experience (range 1 to 32 years) as a nurse. Only six nurses indicated a specialty, and none of the respondents specialized in geriatric or psychiatric nursing.

Case Vignette Recognition of Delirium

The authors found that 83% of the nurses were able to correctly identify dementia in the dementia vignette, but had difficulty correctly identifying delirium versus DSD, as well as identifying the hypoactive form of delirium and DSD. Only 21% were able to correctly identify the hypoactive form of DSD, and 41% correctly identified hypoactive delirium alone in the case vignette (Table 1).

Qualitative data related to knowledge and management of dementia and delirium were gathered from open-ended questions in the vignettes. Each vignette contained the questions: “What do you think you need to do about the problem?” and “What do you think may be causing it?” Table 2 lists several quotes representative of the most commonly occurring content areas and themes. Responses for the suspected cause in Table 2 reveal that the nurses had a good idea of some of the causes of delirium (e.g., metabolic derangement, medications, alterations in surroundings, infection), despite that they did not necessarily label the problem as delirium. Notably, in some of the responses, nurses were still attributing both dementia and hypoactive DSD to normal aging (6 of 29, or 21%).

MSHAKE Results

The MSHAKE scores ranged from 14 to 24, with a mean score of 20.4 (*SD* 2.5). The most frequently missed question (26 of 29, or 89.7%) on the MSHAKE was “Reorienting an agitated dementia patient is helpful.” There was no relationship between overall MSHAKE scores and vignettes responses ($p > 0.05$). In addition, no relationship was found between correct responses on the vignettes and either years of experience as a RN, specialty, or education. This is likely caused by a small sample size resulting in inadequate numbers in the categories for education and specialty. Although not statistically significant, a greater proportion of nurses with a BSN correctly identified the case vignettes relative to nurses with an ADN on each case except hyperactive delirium.

DISCUSSION

Nurses were most likely to correctly identify dementia and hyperactive delirium, and least likely to recognize the hypoactive form of DSD or hypoactive delirium alone. Previous studies have shown that delirium is frequently unrecognized by nurses and physicians and that the hypoactive form of delirium is associated with increased difficulty in detection of delirium. A study by Inouye et al. found that nursing staff correctly identified patients with delirium only 31% of the time. When delirium subtypes were examined, patients with hypoactive delirium were seven times less likely to be recognized by the nursing staff. The presence of dementia, vision impairment, hypoactive delirium, and being older than age 80 were all associated with under-recognition of delirium (Inouye et al., 2001).

This study is the first to examine recognition of DSD compared to delirium alone and dementia alone and is novel in the use of case vignettes to assess nurse recognition of delirium. Early recognition of delirium is needed before the problem can be managed and treated. This is particularly important in persons with dementia who are hospitalized. Immediate evaluation for underlying contributors is of paramount importance to ameliorate delirium and its complications. The use of case vignettes may increase nurse detection of this important and under treated problem.

With clinical problems as complex as DSD, nursing experience and knowledge alone may not be sufficient to predict detection.

The study results related to the lack of relationship found with the MSHAKE scores and the vignette responses, though somewhat surprising, is similar to another study of 107 RNs in

Australia which showed no significant level of relationship between nurses level of geropsychiatric knowledge and their age and length of practice (Hsu, Moyle, Creedy, & Venturato, 2005). The vignettes did show a trend towards improved vignette response with increasing educational level in the current sample of nurses.

The small sample was likely inadequately powered to test the a priori hypothesis correlating geropsychiatric knowledge and experience with vignette interpretation. Although the MSHAKE scores are comparable to the scores obtained from the original validation sample mean score of 20.87 ($SD = 2.98$), it is possible that the MSHAKE is not an effective measure of nursing geropsychiatric knowledge (particularly with regard to delirium and dementia) and additional measures should be used in future studies (Santo-Novak et al., 2001). Another possible reason for these results is that these variables do not adequately capture the nurses' attitude toward delirium.

A study by McCarthy (McCarthy 2003a, 2003b) found that recognition of acute confusion was influenced by the philosophical orientation of the nurse. Nurses who believed good health in aging is normal were more likely to be able to differentiate between delirium and chronic confusion. Specifically, with clinical problems as complex as DSD, nursing experience and knowledge alone may not be sufficient to predict detection.

NURSING IMPLICATIONS

Delirium carries significant risk for those who experience it, especially older adults who also suffer with dementia. Early detection is the key to managing delirium. Nurses are in a particularly powerful position to recognize and manage delirium. Nurses are at the bedside observing the key delirium symptoms (attention, fluctuation, altered level of consciousness), they are interacting with family members who are able to give information about baseline mental status, and are often the first professionals to contact the physician to assess for causes of the symptoms and discuss a plan for management. The qualitative responses given by nurses related to causes and management of the problems reflect that even though nurses may have identified the problem incorrectly they still appeared to recognize that there was a change in status requiring further investigation, either through notifying the physician or taking actions such as assessment of glucose levels and vital signs.

KEYPOINTS

1. Delirium is common in persons with dementia and leads to poor outcomes.
2. Delirium is often unrecognized and mislabeled as sundowning, especially in persons with dementia. Instruments to help nurses recognize delirium are important in assessing this condition.
3. Nurses are at the bedside and in a key position to recognize delirium. Medicating the patient or behavior inappropriately without recognizing the delirium may make the problem worse or further delay its recognition.

The nurses in this study had a high level of general geropsychiatric knowledge in caring for older persons as evidenced by their high MSHAKE scores. However, they did not have the same level of knowledge related to DSD recognition. In this study, experience and education were not related to detection of delirium; therefore, this area may represent a major gap in gerontological and geropsychiatric education.

Nurses are often in a position to call the physician or other provider to suggest a medication to control behaviors in persons with dementia. The number of medications available for treating

patients with dementia and behavioral disturbances is on the rise. Often, patients with dementia may be prescribed antipsychotic medication without recognition or treatment of the underlying cause of the behavior. In many instances, disruptive dementia behaviors both at home and in the hospital may be due to an underlying delirium.

Given the recent evidence for increased risk of death for persons with dementia using these medications (Kuehn, 2005; Schneider, Dagerman, & Insel, 2005; Wang et al., 2005), it is vital that community and hospital nurses recognize delirium and use nonpharmacologic interventions as the first line of management. Medicating the patient inappropriately may worsen the condition or further delay recognition of the problem.

Prompt nurse recognition and management of this problem may allow the patient and caregiver to avoid additional cost and suffering. Educational programs designed to increase awareness of delirium in persons with dementia are needed to fill this critical gap in nursing education. Ways the vignettes could be used by hospital educators and nursing instructors, in tandem with assessment instruments and mental status examinations, include:

- To assist in teaching nurses to assess for acute changes.
- To help detect the presence of delirium in patients who are hospitalized when little is known about prior impairment and the acuteness of their presentation.
- To illustrate the different clinical presentations of DSD.
- To increase awareness of DSD.
- To assess the outcomes of educational programs and interventions.

LIMITATIONS

Several caveats should be acknowledged. First, further refinement of the vignettes may be necessary to improve agreement. Secondly, vignettes do not assess true clinical recognition. It may be more difficult to correctly diagnose a condition, especially one as complex as delirium, from a brief written description versus direct bedside observation. It is possible that this same group of nurses would score higher if observing actual patients. However, the standardization with case vignettes is an important method for comparing individual variation in a complex and varied clinical problem such as delirium.

Case vignettes offer many advantages for studying delirium. They can be completed more quickly and more cost effectively than other methods, and can be used to isolate responses to cases and improve decision-making in the management of complex clinical problems (Veloski et al., 2005). Secondly, the sample was limited to a convenience sample of one hospital in the Southeast, and the results may not necessarily be generalizable to other settings.

CONCLUSION

Nurses play a key role in detection of delirium in a growing population of persons with dementia. These findings should be used to plan and test interventions to increase nursing recognition of DSD. Further refinement of the case vignettes is needed to improve their validity. Future studies should assess nursing attitudes and detection of DSD.

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TABLE 1
RN RESPONSES TO DELIRIUM AND DEMENTIA CASE VIGNETTES (N = 29 NURSES)

Vignette Type	Identification of Case N (%)	What do you think is happening here? (Diagnosis) N (%)	Type of Change Seen N (%) †	Have you cared for similar patients?	Would you call MD? N (%)	Would you medicate? N (%)
Dementia	Correct: 24 (83) Incorrect: 5 (17)	Dementia: 24 (83) DSD: 2 (7) Normal Aging: 3 (1)	Somewhat confused: 27 (93) Very confused: 2 (7)	Yes = 28 (97) No = 1 (3)	Yes = 12 (41) No = 17 (59)	Yes = 9 (33) No = 18 (67)
Hypoaffective Delirium Only	Correct: 12 (41) Incorrect: 17 (59)	Delirium: 12 (46) DSD: 5 (19) Normal Aging: 1 (4) None of Above: 6 (23)	Somewhat confused: 3 (1) Very confused: 2 (7) Acute change: 24 (83)	Yes = 23 (79) No = 6 (21)	Yes = 25 (86) No = 4 (14)	Yes = 8 (32) No = 17 (68)
Hyperactive Delirium Only	Correct: 15 (52) Incorrect: 14 (48)	Delirium: 15 (54) DSD: 11 (39)	Somewhat confused: 1 (4) Very confused? 0 (0) Acute change: 27 (96)	Yes = 25 (86) No = 4 (14)	Yes = 29 (100) No = 0	Yes = 28 (97) No = 0
Hyperactive DSD	Correct: 17 (59) Incorrect: 12 (41)	Dementia: 7 (25) Delirium: 4 (14) DSD: 17 (61)	Somewhat confused: 12 (43) Very confused: 5 (18) Acute change: 11 (39)	Yes = 26 (93) No = 2 (7)	Yes = 27 (96) No = 1 (4)	Yes = 17 (63) No = 10 (37)
Hypoaffective DSD	Correct: 6 (21) Incorrect: 23 (79)	Dementia: 11 (39) Delirium: 3 (11) DSD: 6 (21) Normal aging: 2 (7) None of the above: 6 (21)	Somewhat confused: 14 (48) Very confused: 4 (14) Acute change: 11 (38)	Yes = 19 (66) No = 10 (34)	Yes = 17 (65) No = 9 (35)	Yes = 7 (26) No = 20 (74)

* Correct diagnosis for vignette is in bold font.

† Some data missing due to non-response to question.

DSD = delirium superimposed on dementia; MD = physician

TABLE 2
RN RESPONSES TO OPEN-ENDED QUESTIONS RELATED TO CAUSES AND MANAGEMENT OF DELIRIUM

Vignette	Action to Take	Suspected Cause
Dementia	<ul style="list-style-type: none"> • Reorientation. • Monitor patient frequently to ensure safety, reorient patient as needed. • Notify physician, reorient patient often. 	<ol style="list-style-type: none"> 1 Early Alzheimer's. 2 Being in a strange environment. 3 Possibly medications. <ul style="list-style-type: none"> • Dementia. • Aging. • Possibly infection, early Alzheimer's disease.
Hypoactive Delirium	<ul style="list-style-type: none"> • Inform the physician. • Call the physician. • Notify the physician. 	<ul style="list-style-type: none"> • Overmedication, dehydration, constipation. • Delirium. • Could be sundowners syndrome or medication related.
Hyperactive Delirium	<ul style="list-style-type: none"> • Call family to stay with patient instead of restraining. • Call physician. • Possibly restrain if in danger of hurting self. Take vital signs and check pulse oximeter. 	<ul style="list-style-type: none"> • Possible mental disorder, or sleep deprivation. Could be alcohol withdrawal. • Infection. • Sundowners.
Hyperactive DSD	<ul style="list-style-type: none"> • Call physician, try to calm patient, restrain prn [as needed]. • Reorient her, phone family and physician. • Safety measures, observation." 	<ul style="list-style-type: none"> • Change in health, sleep disturbance. • Change in surroundings. • Worsening Alzheimer's disease or dementia.
Hypoactive DSD	<ul style="list-style-type: none"> • Check patient's blood sugar or electrolytes. • Call physician, check vital signs. • Reorient, notify physician, patient safety, hydration/ nutrition/hygiene. 	<ul style="list-style-type: none"> • Aging, could be infection. • Gradual changes which occur with Alzheimer's type patients. • Depression, too many medications.