HHS Public Access

Author manuscript

Am J Hosp Palliat Care. Author manuscript; available in PMC 2018 September 01.

Published in final edited form as:

Am J Hosp Palliat Care. 2017 September ; 34(8): 744–747. doi:10.1177/1049909116658468.

Effectiveness of the Delirium Observation Screening Survey at Identifying Delirium in Home Hospice Patients

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Abstract

Background—Delirium is common in home hospice patients and conveys significant morbidity to both patients and caregivers. The Delirium Observation Screening Scale (DOS) was developed to improve delirium recognition but has yet to be validated in the home hospice setting.

Objectives—This pilot study aimed to explore the accuracy of the DOS for identifying delirium in home hospice patients.

Design—Prospective delirium evaluation using a convenience sample.

Setting/Subjects—Community hospice patients were approached for study inclusion.

Measurements—Participants were assessed using the Delirium Rating Scale-Revised-98 (DRS-R-98), with results being categorized as “delirium” or “no delirium.” DOS scores, completed by hospice nurses during weekly patient assessment visits were compared to the DRS-R-98 results.

Results—Within this population, 30/78 (38%) assessments were categorized as delirious. In the majority of assessments, 69/75 (92%), the DRS-R-98 and DOS provided congruent results. There were 5 false positives and 1 false negative, demonstrating the DOS to be a clinically useful tool with a sensitivity of 0.97 and specificity of 0.89.

Conclusion—The DOS appears to be an accurate way to screen for delirium in home hospice patients. Validation of the DOS may help to improve delirium recognition and treatment and has the potential to increase quality of life in this vulnerable population. This input will also be taken into consideration in the development of a systematic screening procedure for delirium diagnosis at our local hospice which we hope will be generalizable to other hospice agencies.

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Conflicts of Interest:
The study authors had no disclosures or conflicts of interest.

Introduction

Delirium is a rapidly developing, fluctuating disturbance in awareness and attention, caused by an underlying medical condition. Delirium involves disturbances in cognition, such as memory deficits, disorientation, language, visuospatial ability, or perception.[1–3] Patients who have experienced delirium often have worse physical and cognitive recovery and may recall disturbing and unpleasant events associated with the delirious state.[4]

Delirium is most common in patients experiencing advanced illness, occurring in up to 85% of patients in their last weeks of life.[5] Within the hospice setting, delirium is believed to be prevalent, challenging to assess, under-recognized, and undertreated. In addition to being associated with significant morbidity[8–11] and mortality,[12,13] when delirium is not recognized, lack of treatment can result in increased suffering for the patient, their family, and caregivers.[1,3] This can be of utmost importance as patients experience their last weeks of life.[1]

The ability to identify patients with delirium can help reduce negative outcomes.[1] Screening tools, such as the Delirium Observation Screening Scale (DOS), have been developed to improve delirium recognition. The DOS is based on observation and does not require specific cognitive testing, making it ideal for bedside use.[14] The DOS has been shown to be accurate in an inpatient palliative care population[15] but its validity in an outpatient palliative care population has not been determined.

This pilot study aimed to determine if the DOS is a valid screening tool for delirium identification in home hospice patients. If the DOS proves effective, implementation will improve delirium recognition and diagnosis, which in turn may increase treatment in home hospice patients and thus decrease suffering in this vulnerable population.[1,3]

Methods

Participants

Institutional Review Board (IRB) approval was obtained to recruit patients from a local outpatient community hospice (Iowa City Hospice). A convenience sample was used. Participants were enrolled from 5/10/13 to 8/9/13. All English speaking patients admitted to hospice, who were not comatose, were approached for study inclusion. If participants were unable to consent (e.g. dementia, delirium), consent was given by the participant's legally authorized representative.

Delirium Observation Screening Scale (DOS)

The DOS is a 13-item screen for delirium, based on DSM-IV criteria, designed to be completed based on nurses' observations during care. Results of the DOS were categorized as "delirium" or "no delirium" based on the recommended cut-off of 3.[14]

The Delirium Rating Scale – Revised-98 (DRS-R-98) (Reference Standard)

The Delirium Rating Scale – Revised-98 is a validated,16-item clinician rating scale of delirium severity based on all available information from patient interview, family and

nurses' reports, cognitive tests, and medical reports, evaluated over a 24 hour period.[16] It takes 20–30 minutes to complete and has been successfully used to diagnose delirium in palliative care patients.[17,18,19] Scores ≥15 are indicative of delirium in a general population; however, we used a higher recommend cutoff of ≥18 because we anticipated enrolling participants with dementia.[20]

Data Collection

Home hospice nurses were trained to administer the DOS during a 1 hour educational session on delirium. Each participant was assessed weekly. The nurses completed the DOS during routine weekly visits. A trained medical student administered the DRS-R-98 within 24 hours of the DOS assessment. All visits were completed at the patient's residence. The DRS-R-98 resultant classifications were compared to the DOS results.

Additional data was collected from the electronic medical record which included: age, gender, hospice admission diagnosis, time on hospice, and location of care (personal residence or nursing home).

Statistical Analysis

Statistical analysis was completed using SPSS and SAS for Windows (SAS 9.3, SAS Institute, Inc., Cary, NC). Descriptive statistics were calculated for participant characteristics. Screening tools were compared to the DRS-R-98 as the reference standard, and validity statistics were calculated for delirium. Due to the small sample size Fisher exact tests were used to evaluate whether care location or diagnosis category was associated with delirium and Wilcoxon rank sum test was used to examine the association of age with delirium, categorizing any patient with at least one DRS-R-98 score ≥18 as delirious.

Results

Participant Characteristics

Twenty four participants enrolled in the study. Twenty three participants completed at least one DRS-R-98 and comprise the study sample. The mean age was 82 years (SD 10.3) and 58% were male. The majority received hospice services for 30–90 days. Participant demographics are listed in Table 1. Participants were seen from 1–9 times (mean 3.4, median 3, SD 1.85) over the course of 12 weeks. Of the 78 delirium assessments completed, 75 had a corresponding DOS score charted within 24 hours. No significant differences in baseline characteristics between patients who experienced delirium and those who did not were identified, though there was a trend toward a higher risk of delirium in patients residing in a nursing home compared to those residing in a personal residence (p=0.09).

Delirium Prevalence

Nine of the 23 participants (39%) had at least one DRS-R-98 assessment positive for delirium. Overall, 30 of the 78 delirium assessments (38%) diagnosed delirium (DRS-R-98 ≥18).

DOS Validity

In the majority of assessments, 69/75 (92%), the DRS-R-98 and DOS provided congruent results. The DOS had a sensitivity of 97% (95% CI 81%–100%) and specificity of 89% (95% CI 75%–96%). Of the incongruent DOS results, 5 were false positives (positive predictive value of 85%, 95% CI 68%–94%) and 1 was a false negative (negative predictive value of 98%, 95% CI 86%–99%). Three false positives met criteria for subsyndromal delirium (DRS-R-98 score 8–17).

Discussion

Delirium is a common and distressing problem, which can cause a host of negative outcomes for hospice patients.[24] Early screening and intervention have shown to increase delirium recognition and decrease negative outcomes, but delirium continues to be under-recognized in the hospice population.[1] A previous study examining home hospice patients simply asked the hospice nurse if the patient was more confused than in the previous week (similar to the single question in delirium [SQiD] screen).[24,25] They reported an estimated delirium prevalence of 50% but a confirmatory delirium assessment was not done. The Confusion Assessment Method (CAM)[23] has been used to diagnose delirium both retrospectively (chart review)[1] and prospectively in nursing home and hospitalized patients at the end of life.[24,25]. Unfortunately, the results are mixed as to the usefulness of the CAM in this population. In a nursing home population, nurses using the CAM only identified half of delirium events compared to trained research assistants.[26] While the CAM has been shown to be both sensitive and specific, the reliability is dependent on the training and experience of the user and it requires the performance of cognitive testing.[24,27,28] This makes the CAM more burdensome for patients and less feasible for nursing staff.

The DOS has the benefit of being observation based and does not require cognitive testing. Because examples for specific behaviors are provided as part of the screening, it can be quickly taught to healthcare personnel. While it has not been trialed in a home hospice population, it demonstrated good accuracy and was well received by nurses in an inpatient palliative care population.[15] Detroyer et al reported that the DOS demonstrated a high sensitivity (97%) and specificity (89%) in detecting delirium in palliative care inpatients. It appears to be as effective as the CAM. While the DOS had a number of false positives, the majority scored in the sub-syndromal range for delirium which may indicate that the DOS is actually more sensitive as a screening tool, including patients who are showing signs of being at a very high risk for delirium, but are not yet delirious.

Strengths of the study include: strong evaluator consistency (one evaluator for all DRS-R-98 screenings); demonstration in a real life practice environment with 10 RNs using the DOS; and enthusiastic support from the hospice. Limitations include: small population size; one screening site (one hospice agency), difference in the DRS-R-98 and DOS evaluations of up to 24 hours; and validity analysis based on 75 paired observations in 23 patients, the results of which are weighted toward performance in participants with larger numbers of observations. In addition, consenting of patients was limited by preexisting delirium and dementia. It was difficult to consent delirious patients, and some patients did not have a legally authorized representative present to obtain the required consent; therefore, these

patients were excluded from participation. Based on previous estimates of delirium in hospice and palliative care patients we expected a prevalence of about 50%.[29,30] Our prevalence of 39% was likely lowered since patients with delirium were less likely to enroll. Future studies may wish to include additional provisions to acquire consent from delirious patients.

Improved delirium assessment is needed in order to minimize the impact of delirium on patients living with advanced illness and their caregivers.[1] The DOS appears to be a potentially useful way to screen for delirium in home hospice patients with reasonable accuracy; however, further studies are needed to further validate the DOS in this setting.

Acknowledgments

This study was funded by the Summer Research Fellowship program (T35 HL007485 31) sponsored by the University Of Iowa Carver College Of Medicine. Drs. Weckmann and Carnahan were supported by the Health Resources and Services Administration (UB4 HP19054, Iowa Geriatric Education Center) as well as US DHHS, Agency for Healthcare Research and Quality (AHRQ 1 R18 HS022666-01).

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Table 1

Participant Demographics

Characteristic	Delirium (N=9)	No Delirium (N=14)	P-value
Mean Age (years)	88 (SD 6.7)	78 (SD 11)	P=0.23
Gender:			P=0.67
Male (n=13)	6	7	
Female (n=10)	3	7	
Location of care			P=0.09
Home (n=8) *	1	7	
Nursing Home (n=16)	8	7	
Time on Service			P=0.53
0–30 days (n=4)	1	3	
31–90 days (n=10)	3	7	
>90 days (n=9)	5	4	
Diagnosis			P=0.24
Cancer (n=7)	1	6	
Solid organ (Liver, cardiac, lung) (n=8)	3	5	
Neurologic/Dementia (n=8)	5	3	

* one subject was in assisted living