Model Predicts Pain in Patients With Dementia

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Many nursing home residents with dementia are at risk for undiagnosed, underestimated, and undermanaged pain because of their difficulty in communicating, but ongoing study suggests that objective assessment of a resident's health status can identify those with dementia who are in pain but can't report it themselves.

For the study, Christie Teigland, Ph.D., and her team at the New York Association of Homes & Services for the Aging first identified risk factors for pain in more than 500,000 cognitively intact residents of 670 nursing homes throughout New York state by applying logistic regression analysis to Medicare Minimum Data Set (MDS) data on these residents.

In keeping with a 2008 position statement by the American Society of Pain Management Nurses, the researchers assumed that the factors causing pain in these residents also would cause pain in dementia residents

The investigators found that being older and male decreased the likelihood that any person would report pain (odds ratios of 0.72-0.45, depending on the age group, and 0.67, respectively). Higher body mass index emerged as a risk factor for more pain (odds ratio of 1.09-1.29).

Many diseases, conditions, and treatments correlated directly or inversely with pain. For example, arthritis, hip fractures, and asthma were associated with increased likelihood of pain. Infections and skin conditions increased the risk for pain, whereas preventive skin treatments decreased risk. (See box, page 41)

The researchers used the data to apply a predictive risk model to pain reported by cognitively intact residents and estimate undetected or underreported pain in residents with dementia. Dr. Teigland found a difference of 16 percentage points between observed pain in the residents with dementia (19% of residents) and expected pain in that population (35% of residents). Because the researchers adjusted the model for diseases and conditions that can cause pain, the 84% difference indicates the underassessment of pain in residents whose dementia prevents full communication about their pain, Dr. Teigland asserted.

Overall, 42% of residents free of dementia had observed pain, compared with 19% of residents with dementia, a 23-point difference. When the researchers used their model to assess dementia patients' pain, the differences in expected pain rates between cognitively intact residents and dementia residents were much smaller, with rates of 45% versus 35% overall. Thus, after risk adjustment for conditions that cause pain, the expected rates of pain for dementia residents are 84% higher than rates actually reported.

This difference is further confounded by the finding that after risk adjustment, the older the resident, the lower the likelihood of reporting pain. There is disagreement in the literature about why this is the case.

Some studies suggest the threshold for and sensitivity to pain decreases with advancing age, so older residents experience less pain. Other studies state that pain is reported less with age because of attitudes (i.e., old people expect to have pain; or they are afraid of taking the medications).

If the latter is true, the difference between expected and reported pain is even higher than the risk adjusted data show because dementia residents tend to be older on average, said Dr. Teigland. "What is clear from this analysis is that pain is significantly underassessed in residents with dementia as compared to residents without dementia but with similar characteristics and risk factors for pain," she said.

Dr. Teigland reported the findings at a conference on dementia sponsored by the Alzheimer's Association.

The new model isn't the only way to assess pain in nursing home residents, including those with dementia, she said. In those able to communicate their pain, self-reporting is the most reliable. Numeric rating scales, verbal descriptor scales, pain-thermometer scales, and faces scales can all be useful in assisting residents with self-reports, said Dr. Teigland. Assessments in those with dementia should include a review of potential causes of pain, observation for both verbal and nonverbal pain behaviors, and observation for behavior changes such as acting out or withdrawing. Surrogate reporting, done by nursing home staff, family members, and clergy, is also important, as are analgesic trials to test for response, she said.

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1. Wortmann RL, Kelley WN. Gout and hyperuricemia. In: Harris ED Jr, Budd RC, Genovese MC, et al, eds. *Kelley's Textbook of Rheumatology*. 7th ed. Philadelphia, Pa: Elsevier Saunders; 2005:1402-1429. 2. Roberts LJ, Morrow JD. Analgesic-antipyretic and antiinflammatory agents and drugs employed in the treatment of gout. In: *Goodman*

Pain detection has been shown to improve with the use of a combination of these tools in residents with dementia.

For the study, which was funded by the Alzheimer's Association, dementia residents were defined as those with a diagnosis of dementia or Alzheimer's disease or as those with a cognitive performance score (CPS) of 4-6, indicating moderately severe to very severe cognitive impairment. The CPS is a validated measure of cognitive status and was used because about 10% of nursing home residents with dementia do not have a diagnosis coded on the MDS. About 60% of nursing home residents in the study met these criteria.

Dr. Teigland said the findings have important implications for residents with dementia, who could receive better pain treatment and thus have a better quality of life if more caregivers were to use the new model to assess pain.

For residents with dementia, improved pain assessment and treatment have been shown to be associated with less depression, fewer negative behaviors, and slower functional decline, she said. The result for nursing homes could be more accurate reporting on quality of care measures, including those reported to Nursing Home Compare, the Centers for Medicare and Medicaid (CMS) Web site for the public.

Scores on quality measures can be skewed by the underdiagnosis and undertreatment of pain in dementia residents, Dr. Teigland noted. The findings in the current study reveal that CMS quality measures offer "a highly skewed snapshot of facility pain rates," she said in an interview.

These hidden problems with quality measures tend to multiply, Dr. Teigland added. Dementia residents are up to 5 times as likely as others to have pain-related outcomes such as agitation and depression, which lead to higher use of antipsychotics in a facility, she explained. Better quality measures would ensure that serious quality of life issues are not missed for the growing dementia population, she said.

The study indicates that these problems can be circumvented by using the wealth of resident information readily available in every nursing home's MDS, Dr. Teigland concluded. Such data on medial conditions and behavioral issues can identify cognitively impaired residents who are suffering from undetected or undertreated pain.

The New York Association of Homes & Services for the Aging, a nonprofit association, has incorporated Dr. Teigland's model into a Web-based informatics software tool, EQUIP for Quality. The decision-support tool includes other MDS-based predictive risk assessment models. It is available to nursing homes nationwide and is already being used by more than 400 facilities in 22 states. More information is available at www.equipforquality.com. ■

Predicting Pain In the Elderly

Dr. Christie Teigland noted that men and older residents are less likely to report pain; obese individuals and those with arthritis are more likely to experience pain. Fractures increase the risk of pain by 100%.

Numerous risk factors related to incontinence are related to pain. For example, residents on bladder training were more than 50% more likely to have pain, and those with a scheduled toileting plan were less likely to have pain. Surgical wounds increased the likelihood of pain by more than 100%.

Dr. Teigland's study assessed the following risk factors for their association with pain in residents without dementia in New York nursing homes. For each factor, the odds ratio indicates the likelihood that a patient has pain.

Aged 65-75 years	0.72
Aged 95+ years	0.45
Male gender	0.67
BMI greater than 40	1.29
Arthritis	1.82
Hip fracture	1.42
Other fracture	2.06
Pathologic bone fracture	1.60
Asthma	1.13
Allergies	1.15
Constipation	1.37
Bladder training program	1.54
Scheduled toileting plan	0.90
Wound infection	1.25
Physical therapy	1.58
Abrasions, bruises, skin tears, cuts	1.13
Burns	1.50
Open lesions (cancer)	1.26
Surgical wounds	2.24
Preventive or protective skin and/or foot care	0.85
Dizziness, vertigo	1.35
Edema	1.31
Fever	1.43
Vomiting	1.39
Fall	1.43
End-stage disease	1.72
Advanced-stage pressure ulcers, stage 2-4	1.63
Stasis ulcer	1.85