

Observational Report

Pain in Nursing Home Residents and Correlation with Neuropsychiatric Disorders

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Background: Pain is a common problem in older age and strongly interacts with neuropsychiatric disorders. In this paper we studied the prevalence of pain and the connection between pain and neuropsychiatric comorbidities among older nursing home residents.

Objective: To determine if data provided in 2004 National Nursing Home Survey supports connection between pain and neuropsychiatric comorbidities among older nursing home residents.

Setting: Medical university.

Design: Retrospective study of published reports

Methods: We used the results of the 2004 National Nursing Home Survey (NNHS) to determine the rates and correlations of pain parameters with the main neurodegenerative and psychiatric diagnoses in residents over 65 years of age including Alzheimer's and Picks dementia, schizophrenia, depression, bipolar disease, anxiety, and obsessive-compulsive disorder.

Results: Pain was reported by 22% of residents over 65 years of age. Patients with anxiety or depression had the highest prevalence of pain, 29.4% and 24.4%, respectively. Patients with dementia had the lowest rate of reported pain, 14.5%. All neurodegenerative and psychiatric diagnoses had significant correlations ($P = 0.000$) with pain rate, however, only anxiety ($r = 0.056$) and depression ($r=0.025$) positively correlated with the presence of pain. There were clear differences in the highest levels of reported pain in different neurodegenerative and psychiatric groups. We created the Disease-Specific Pain Intensity Scale (DSPI Scale) which can be calculated for each diagnostic entity. The DSPI was highest in patients with obsessive-compulsive disorder (721) and lowest in patients with bipolar disease (358). The average value of this scale in nursing home residents who reported pain in the last 7 days was 488.

Limitations: The overwhelming majority of patients had chronic somatic diseases that were not included in the analysis and could skew the results. In addition, pain perception could be affected by prescribed medications which were not taken into consideration. Moreover, neurodegenerative and psychiatric disorders could interact among each other and overlapped cases were not regarded in our research. Finally, the new instrument created for evaluating the spectrum of highest pain intensities in a group of patients with a specific diagnosis requires validation. It is a unidimensional scale that does not incorporate the length of time a person has experienced pain, an important parameter in pain chronicity.

Conclusion: It is important when assessing pain to consider the patient's neuropsychiatric status and especially communication abilities. The information above helps understand the variances in pain parameters in neuropsychiatric patients and may ultimately lead to better pain management in these difficult patients.

Key words: Pain, neurodegenerative, psychiatric, nursing home

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Pain coexisting with various neuropsychiatric disorders is a broad topic. Chronic pain has traditionally been linked with old age and viewed to be differently conditioned in elderly people

from pain in younger adults (1). In the physiology of "pain in the elderly" one cannot ignore the impact of parallel medical and mental diseases. With aging, there is an increase in the incidence of neurodegenerative

and psychiatric disorders, especially Alzheimer's disease and depression. These disorders often require institutionalization and a high percentage of nursing homes residents suffer from one or 2 neuropsychiatric disorders which may be the primary or secondary reason for their placement. Nonetheless, the interaction between neuropsychiatric disorders and pain has not been sufficiently studied from the aspects of pain prevalence and intensity. The reciprocal relationship between these illnesses and pain deserves a multifaceted approach, particularly examining how the presence of one may influence or be influenced by the other. In this paper, we studied the prevalence of pain and association with neuropsychiatric disorders among older nursing home residents.

METHODS

The 2004 National Nursing Home Survey (NNHS) is one in a continuing series of nationally representative sample surveys conducted by the National Center for Health Statistics (NCHS) about nursing homes, their services, their staff, and their residents. The total number of nursing home facilities that participated in the 2004 NNHS was 1,174. Data for the survey were obtained through personal interviews with facility administrators and designated staff who used administrative records to answer questions about the facilities, staff, services, and programs, and medical records to answer questions about the residents. The results of the 2004 NNHS are provided on the website of the Centers for Disease Control and Prevention (CDC) (2). The data includes information on 1,492,200 residents and 241 variables. We chose the main pain-related parameters, pain presence (Yes or No) and intensity (0–10 scale), and analyzed their percentages and associations with neurodegenerative and psychiatric diagnoses in residents over 65 years of age (88%). These included Alzheimer's and Picks dementia (ICD-9 331), schizophrenia (ICD-9 295 297 298), depression (ICD-9 311 296.2 296.3 300.4), bipolar disease (ICD-9 298), anxiety (ICD-9 300 300.1 300.2 300.5 300.8 300.9), and obsessive-compulsive disorder OCD (ICD-9 300.3). We calculated the percentages, equations, and correlation coefficients using Excel and SPSS. It is important to remember that correlation or association is not synonymous with causality.

RESULTS

Valid data show that pain was reported by 293,827 (22%) residents (in the past 7 days before the survey).

Table 1. *Prevalence of pain in nursing home residents and correlation with neurodegenerative and psychiatric disorders.*

	Number	Pain	Correlation
Dementia	283904	14.5%	-0.096
Schizophrenia	146462	17.4%	-0.048
Depression	459269	24.4%	+0.025
Bipolar Disorder	24206	18.1%	-0.016
Anxiety	153573	29.4%	+0.056
Obsessive-Compulsive Disorder	5063	18.3%	-0.007

Patients with anxiety or depression had the highest prevalence of pain, 29.4% and 24.4%, respectively, whereas patients with dementia had the lowest rate of reported pain, 14.5%. All neurodegenerative and psychiatric diagnoses had significant correlations ($P = 0.000$) with pain rate; however, only anxiety ($r = 0.056$) and depression ($r = 0.025$) positively correlated with the presence of pain (Table 1).

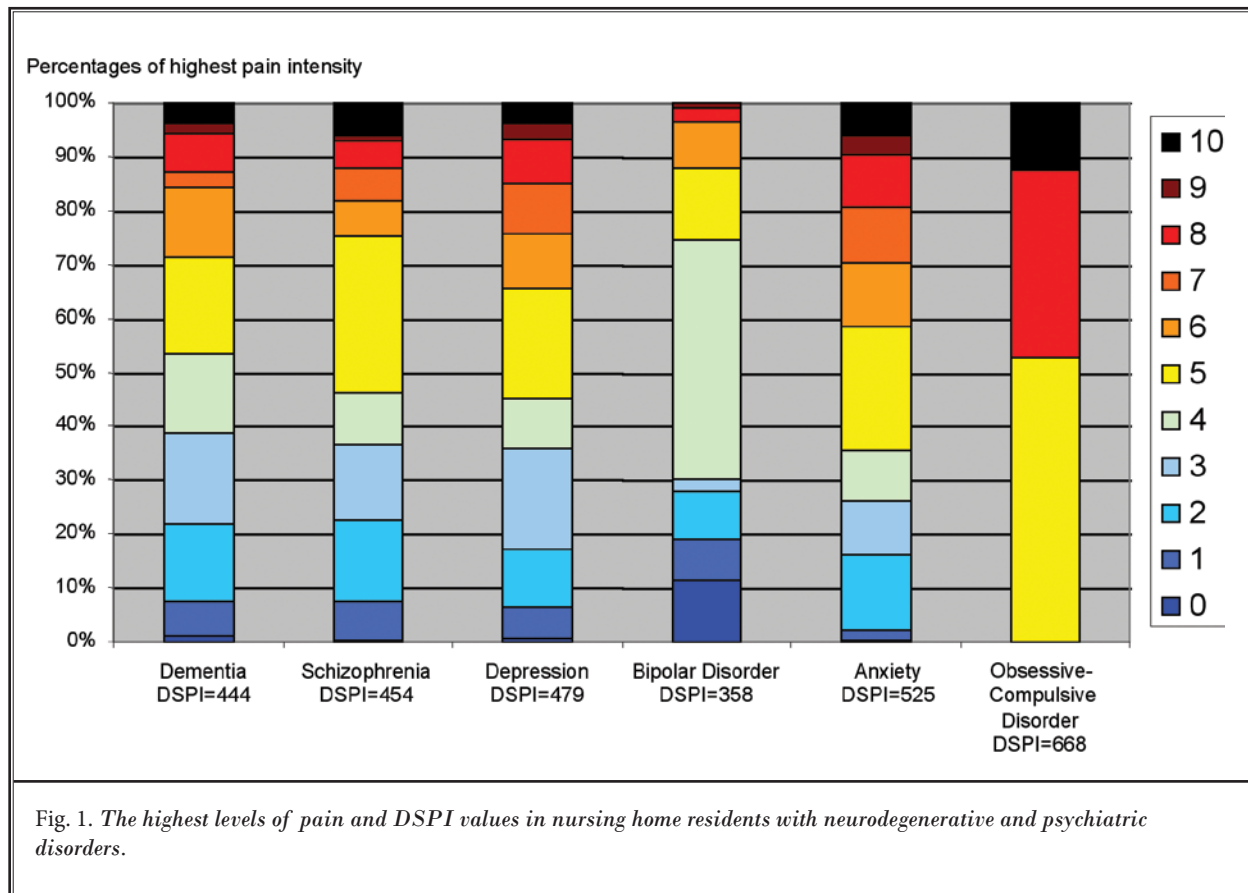
There were clear differences in the highest levels of reported pain among neurodegenerative and psychiatric groups. We created the Disease-Specific Pain Intensity Scale (DSPI Scale) which can be calculated for each diagnostic entity by the following equation:

$DSPI = (\sum X * Y) * 100$ where X is the highest pain level and Y is the percentage of this pain level in the group. Higher values of DSPI indicate higher levels and rates of maximum pain in the patient group. In other words, the higher the value of the index the more painful the disease is. The scale has a range from $(\sum 0 * 100\%) * 100 = 0$ to $(\sum 10 * 100\%) * 100 = 1,000$.

The DSPI is different from the simple numeric 0–10 scale in that it is measured for a group of patients with a specific diagnosis whereas the numeric 0–10 pain scale is administered individually. DSPI was uppermost in patients with obsessive-compulsive disorder, 668. On the contrary, it was lowest in patients with bipolar disease, 358 (Fig. 1). The average value of this scale in nursing home residents who reported pain in the last 7 days was 488.

DISCUSSION

Chronic pain is a common and difficult problem which is often comorbid with medical, surgical, and psychiatric conditions. Peculiarities of pain perception and experience frequently occur in patients with psychiatric disorders (3,4). Pain and psychiatric disorders may overlap and obscure each other due to shared neurochemical pathways. Pain and mood disorders,



for example, share the same neurotransmitters which constitute the physiological basis for the efficacy of antidepressant medications in chronic pain patients (4). Depression is known to be associated with abnormalities in serotonin and norepinephrine, neurotransmitters that also modulate the endogenous analgesic system. Agents that inhibit pain signals and support serotonin and norepinephrine levels, such as serotonin-norepinephrine reuptake inhibitors (SNRIs), may provide pain relief as well as alleviate mood symptoms.

Depressed patients have frequently been described as vulnerable to pain but paradoxical sensitivity to experimental pain has also been described in some reports. The absolute pain perception threshold may be increased in major depression patients, however, the relative pain perception threshold has been found to be significantly reduced (5-7). The physiological basis for this phenomenon remains elusive. The fact that the relative pain perception threshold in that study was negatively correlated with anxiety suggested that a reduction of pain perception thresholds in depressive patients might be attributed to anxiety and impaired

stress-coping (5,8). In our study, the prevalence of pain was highest among patients with anxiety then depression and the highest intensities of pain were perceived in patients with obsessive-compulsive disorder. .

Other reports suggest that depressed subjects are less likely to perceive a sensory stimulus as being painful compared with nondepressed controls (6,9). A recent study has confirmed hypoalgesia to heat and electrical pain in depressed patients but discovered hyperalgesia to ischemic muscle pain and significant increase in thermal and electrical pain tolerance on the right hand side confirming previous reports about lateralization of pain perception in depression (7). Painful stimuli might be processed differentially depending on the localization of pain induction in depression. On the other hand, in patients with obsessive-compulsive disorder a hypochondriac component dominates in their perception of their body stimuli producing the abovementioned result

The reasons why pain manifests itself differently in schizophrenia and bipolar disorder are not yet clear. Bipolar disease negatively correlates with

the presence of pain and, if present, is associated with the least severe pain. The best answer to that question can be found in the disease cyclicality. Just as depression and mania rotate in the same mind-soul, feelings of worthlessness and guilt alternate with states of elation causing distraction and lack of insight (10). The same mechanism can possibly apply to schizophrenia where mood oscillations and distortions in sensory perception contribute to pain apathy which may intrinsically be a different form of pain expression rather than real endogenous analgesia (11). This can explain the low association of schizophrenia and bipolar disorder with pain, an association that is not widely recognized.

Patients with dementia have the lowest prevalence of pain and lower-than-average pain intensity. This may be attributed to communication difficulties in patients with declining cognitive capacities characteristic of dementia. The level of awareness about pain in these patients also suffers with the progression of the disease.

CONCLUSION

This paper extends our understanding of the interaction between pain perception and neuropsychiatric disorders despite some limitations of which we should be aware. The overwhelming majority of these patients had chronic somatic diseases that were not included in the analysis and could skew the results. In addition, pain perception could be affected by pre-

scribed medications which were not taken into consideration. Moreover, neurodegenerative and psychiatric disorders could interact among each other and overlapped cases were not regarded in our research. Finally, the new instrument created for evaluating the spectrum of highest pain intensities in a group of patients with a specific diagnosis requires validation. It is a unidimensional scale that does not incorporate the length of time a person has experienced pain, an important parameter in pain chronicity.

It is important to note that this study is epidemiological in nature, and results may not be applied to individual patients. Despite this, the conclusion that older adults with neuropsychiatric disorders have problems with pain perception is significant as pain virtually becomes universal with aging. It is important when assessing pain to consider the patient's neuropsychiatric status and associated communication abilities. Analogous to pain levels, the reaction of these patients to painful impulses may range from indifference to panic with a wide spectrum of pain coping, communication, and adjustment skills. Therefore, the information above may help recognize and ultimately treat pain complaints in neuropsychiatric patients in a more directed fashion. Further research is needed to look into other factors affecting pain perception, the complex relationship between neuropsychiatric status and pain, and the role of psycho- and pharmacotherapies in the optimization of pain management in residents of nursing homes.

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