ORIGINAL RESEARCH

Chronic Pain and Related Factors in Patients Aged ≥80 Years

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Abstract

Objective: Chronic pain ranks among one of the most common, costly and incapacitating conditions in later life. The prevalence of chronic pain in the adult population ranges from 20% to 50%. Pain among older persons is almost always the result of pathology involving a physical or psychological process. In this study, we aimed to assess the prevalence of chronic pain in older adults and factors associated with chronic pain.

Materials and Methods: A total of 215 patients aged ≥80 years were included in the study. In addition to the demographic characteristics of the patients, geriatric syndromes were assessed and comprehensive geriatric assessment of frailty and functional and nutritional status was performed to detect chronic pain prevalence and its associated factors in older adults. SPSS 21 for Windows program was used for statistical analysis.

Results: Of the patients included in the study, 145 were female (67.4%) and 70 were male (32.6%). The mean age of the patients was 83.9±3.5 years. Chronic pain was present in 124 patients (57.7%) and was more common in females (p=0.006). When the relationship between chronic pain and geriatric syndromes was evaluated, falls in the past year, urinary incontinence, frailty and depressive mood were found to be associated with chronic pain (p=0.04, p=0.001, p=0.000 and p=0.04, respectively). Female gender and frailty were independently associated with chronic pain with odds ratios of 2.07 and 4.78, respectively.

Conclusion: We found a high rate of chronic pain and geriatric syndromes as well as an association between them. To effectively address chronic pain in later life, a multimodal approach to treatment must involve a comprehensive assessment of pain in the older adult and management including pharmacologic and nonpharmacologic treatments that incorporate the functional, cognitive and comorbidity status of the patient.

Keywords: Chronic pain, frailty, urinary incontinence, depression, falls

Introduction

Pain is a common and debilitating problem among older adults. In the definition of chronic pain, authors have used various durations of painful sensation, including pain longer than 3 months, 6 months or more (1). The prevalance of chronic pain in the adult population ranges from 20% to 50%, depending on the study population, the definition of "chronicity" and the definiton of the site of pain (2). Researches consistently show the prevalence of pain rising to a peak of 30-65% in the age group of 55-65 years and then declining somewhat to around 25-55% among those aged 85 years or over (3,4). Although there is a minor reduction in pain prevalence in the very old age group due to the survivor effect (i.e., persons with less favorable health conditions would have had early mortality), it is estimated that 25-55% of very old adults have at least one pain problem (5).

Despite the high prevalance of pain and its related negative effects on later life, pain is often underreported in older people. There is a common misconception about pain as if it is something inevitable to feel and should be tolerated, a stoic approach. Whereas, chronic pain does not constitute part of the normal aging process (6). It is almost always the result of pathology involving a physical or psychological process. Worldwide, the most common pain disorders reported by older people include arthritis (e.g., rheumatoid arthritis, osteoarthritis), back pain, and fibromyalgia (7,8). The ever-growing worldwide proportion of older people and lifespan show that chronic pain in older adults is an important issue and should be taken into account,

as it causes burden to not only patient's self, but to health employee, caregivers and also economically.

Identification of risk factors associated with development and persistence of chronic pain is important, as it would enable targeting of preventive interventions and improve clinical management. Factors associated with chronic pain are relatively well defined among the general population and include younger age, female gender, lower social class, socio-economic status and psychological factors (e.g. anxiety and depression) (9). Actually, chronic pain rarely occurs solely as a single symptom during old age. Instead, previous cross-sectional studies have shown that chronic pain is generally accompanied by other symptoms and limitations of old age such as mood disturbance, sleep and mobility disorders (10,11). Therefore, this data brings to mind that there would be a relationship; may be common underlying risk factors and mechanisms between chronic pain and those common limitations known as geriatric syndromes.

Geriatric syndromes are prevalant especially in very old age group, but the relationship between persistent pain, one of the most incapacitating entities of senior life, with the geriatric giants are not well demonstrated in this population. Thus, our aim is to detect the prevalance of chronic pain, and assess relationship between chronic pain and geriatric syndromes among individuals aged ≥80 years.

Materials and Methods

This study is retrospectively designed. The patients older than 80 years old, admitted to our geriatric outpatient clinic for any complaint were included in the study. Patients who were questioned for presence of chronic pain (pain in any site of the body that persists more than 3 months) are included in the study. Exclusion criteria were age <80 years and patients with missing data on chronic pain.

Age, gender, presence of chronic pain and geriatric syndromes are derived from the patient files. Geriatric syndromes are assessed in every patient during "comprehensive geriatric assessment" visits in our outpatient clinic. Patients were asked if they had experienced any fall during the last year. Sleep disturbance is questionned as if the patient had experienced difficulty in falling asleep and/or maintaining sleep at least three times a week and this difficulty had been a problem for at least one month (12). Constipation is questionned as if the patient had experienced unsatisfactory defecation as infrequent stool, difficult stool passage or both at least for previous 3 months. Dependence in activities of daily living (ADL) and instrumental activities of daily living (IADL) were assessed with Katz and Lawton ADL Scales. Maximum score of Katz index is 6 points, which means person is totally independent in basic ADL; and maximum score of Lawton scale is 8, which means person is totally independent in IADL. Therefore, patients were

divided as totally independent; or dependent if he/she needs assistance in any activities questionned. Frailty was assessed by FRAIL scale which includes five components; fatigue, resistance, ambulation, illness and loss of weight. Frail scale scores range 0-5; ≥3 represents frail, 1-2 pre-frail and 0 for robust health status (13). In our study FRAIL score ≥3 was accepted frail and scores <3 non-frail. Cognitive state was assessed by questionning if patient had any complaint about their memory and also mini-mental state examination (MMSE) was applied. MMSE point <24 considered as impairment in cognitive functions (14). For assessment of depressive mood, patients were asked if they felt depressed or sad in the past month. Polypharmacy was defined as the use of ≥4 medications (15). Malnutrition is evaluated with mini nutritional assessment-short form (MNA-SF); ≤11 points considered as malnutrition (16). Because this is a retrospective study and the data were collected from patient files, no ethical committee approval was obtained.

Statistics

A descriptive analysis was performed with means and standard deviations for continuous variables and frequencies for categorical variables. The two independent groups were compared by Mann-Whitney U test. Chi-square test with Yates's correction and Fisher's exact test was used when appropriate for nonnumeric data. Logistic regression analysis was used to find associations among chronic pain and GS. Statistical significance was determined at $p<0.05$. SPSS version 21 (IBM corporation, Armonk, NY, USA) was used for all statistical analysis in this study

Results

Two hundred and fifteen patients aged ≥80 years were included in the study. One hundred and forty-five were female (67.4%). Mean age was 83.93±3.55 years. One hundred and twenty-four patients (57.7%) reported chronic pain. The prevalance of geriatric sydromes are shown in Table 1. The most common geriatric syndromes were polypharmacy (82.2%), dependence in IADL (64.2%) and sleep disturbances (56.3%). There was no significant relationship between age and chronic pain in adults older than 80 years (p=0.70). The relationship between chronic pain and gender and geriatric syndromes are given in Table 2. Chronic pain was significantly more common in female patients (p=0.006). When the relationship between chronic pain and geriatric syndromes were assessed, we found that patients who had falls in the past year, urinary incontinence, frailty and depressive mood were experiencing chronic pain more common (p values were; 0.04, 0.001, 0.000 and 0.04, respectively).

We found no significant relationship between chronic pain and malnutrition with MNA-SF cut-off point of ≤11, which not only includes patients with malnutrition, but also the ones with malnutrition risk. Therefore, we set the cut-off to ≤7 and

included only the patients with malnutrition according to the test. However, the result did not change and no significant relationship was found between two (p=0.77).

We performed regression analysis in order to detect independent factors associated with chronic pain. Chronic pain was our dependent variable, and the independent variables were female gender, frailty, falls, depressive mood and urinary incontinence. A statistically significant relationship was found between chronic pain and female gender and frailty, in regression analysis (p values were 0.02 and 0.00, respectively). The Odds ratios of chronic pain in female gender and frailty were 2.07

and 4.78 (95% confidence interval: 1.08-3.97 and 2.99-11.4), respectively.

Discussion

The data about chronic pain prevalance and pain related factors among very old population is limited and heterogenous, because of high variability mainly due to the differences across the studied populations, the methodology of the studies and variable definitions of pain chronicity (17,18). Therefore, our study is important in regards of contribution to the literature about this specific population. Our results suggest that chronic pain is prevalant in very old people and being female and frail seem to be significantly associated with suffering chronic pain.

Chronic pain was seen in 57.7% of our patients and seen more common in female ones. PolSenior study conducted in Poland among older adults showed that 41.8% of community dwelling individuals older than 80 years suffered from chronic pain (19). Blyth et al. (20) found that the prevalance of chronic pain was 55% for those aged above 85; which is similar to our finding. A Sweden study searched for the prevalance of chronic pain among oldest old and found that the percentage of mild or severe pain in individuals over 85 years was 68 (21). These differences in prevalance rates stem from lack of uniformity among these studies in terms of age, setting, and definition of chronic pain.

Female predominance in terms of chronic pain is an expected finding; as in the literature, it is often reported to be more common among women (22,23). Also, in logistic regression analysis, we have found that female gender is independently associated with chronic pain among oldest adults. There have been reported different risk factors for developing chronic pain, and female sex is one of the most prominent (24). The reason why female adults have a tendency to suffer chronic pain more than males is unclear. In fact, underlying biological differences in pain mechanisms may predispose women to have more pain but sociological and psychological factors also influence pain perception and behavior (25).

Frailty was significantly associated with chronic pain in our study. Also, in multivariate analysis, we found that frail older adults suffer chronic pain almost five times more than non-frail ones. There are many validated tools for assessment of frailty. We used FRAIL index and the questionnaire that seeks for individuals having more than five chronic comorbidities, weight loss and who are easily fatigued and have reduced capacity for ambulation and resistance. Therefore, it can be predicted that the profile this index offers as ''frail'' would be more prone to suffering pain than healthy and fit older adults. Current studies also support our findings (26,27). In addition, Lohman et al. (28) found that the inclusion of persistent pain as an additional criterion for frailty led to a potentially better prediction of

Table 1. Geriatric syndrome data of the participants

Geriatric Syndromes	N out of total (%)
Falls in the past year	102/214 (47.7%)
Sleep disturbances	121/215 (56.3%)
Urinary incontinence	118/215 (54.9%)
Constipation	79/213 (37.1%)
Dependence in ADL	109/215 (50.7%)
Dependence in IADL	138/215 (64.2%)
Frailty	58/214 (27.1%)
Cognitive dysfunction (yes or no)	81/213 (38%)
Cognitive dysfunction (MMSE)	29/102 (28.4%)
Depressive mood	67/199 (33.7%)
Polypharmacy	176/214 (82.2%)
Malnutrition	43/126 (34.1%)

ADL: Activities of daily living, IADL: Instrumental activities of daily living, MMSE: Mini-mental state examination, N: Number of the patients

Table 2. Univariate analysis for chronic pain related factors

Variables	Chronic pain (+)	Chronic pain (−)	p value
Age	83.85±3.48	84.03±3.67	0.70
Female gender	93 (64.1%)	52 (35.8%)	0.006
Falls in the past year	66 (64.7%)	36 (35.2%)	0.04
Sleep disturbances	71 (58.6%)	50 (41.3%)	0.78
Urinary incontinence	80 (67.7%)	38 (32.2%)	0.001
Constipation	52 (65.8%)	27 (34.1%)	0.06
Dependence in ADL	69 (63.3%)	40 (36.6%)	0.09
Dependence in IADL	81 (58.6%)	57 (41.3%)	0.77
Frailty	47 (81%)	11 (18.9%)	0.000
Cognitive dysfunction (yes or no)	46 (56.7%)	35 (43.2%)	0.88
Cognitive dysfunction (MMSE)	15 (51.7%)	14 (48.2%)	0.26
Depressive mood	45 (67.1%)	22 (32.8%)	0.04
Polypharmacy	105 (59.6%)	71 (40.3%)	0.20
Malnutrition	28 (65.1%)	15 (34.8%)	0.56

ADL: Activities of daily living, IADL: Instrumental activities of daily living, MMSE: Mini-mental state examination

incident adverse outcomes. In addition, chronic pain among community-dwelling older adults is a risk factor for worsening frailty (29). Therefore, the development of an effective prevention strategy for frailty and effective management of chronic pain are crucial.

In the study population, chronic pain and fall history was significantly associated. However, fall history was not an independent risk factor for chronic pain. In fact, pain contributes to functional decline and muscle weakness, and is associated with mobility limitations that could predispose to falls (30). Falls on the other hand can be the major cause of pain experience and are strongly associated with a number of other poor health outcomes such as cognitive impairment, hip fracture, institutionalization and death (31). Multiple studies show that patients with chronic pain are more likely to have fallen in the previous year (32,33); but whether fall history is an independent risk factor for chronic pain seems to be unclear. Therefore, more studies on this spesific population, oldest adults, are needed about this issue.

There was a significant association between urinary incontinence and chronic pain in our study group. In fact, urinary incontinence was not an independent risk factor for chronic pain. There are studies showing strong associations between chronic pain and urinary incontinence (34,35) and urinary incontinence was found to be strongly associated with musculoskeletal disorders and back problems. Not only disk disease can affect bladder function, also mobility disorders related to arthritis and back problems can interfere with reaching the toilet. Furthermore, central sensitization, which is an induced state of spinal hypersensitivity and centrally amplified pain perception, is postulated to underlie the pathophysiology of a range of chronic pain and somatic conditions and show some similarities with pathophysiologic mechanisms believed to contribute to overactive bladder (36).

In univariate analysis, there was a significant association between depressive mood and chronic pain. However depressive mood was not an independent risk factor for chronic pain according to our logistic regression analysis. Many studies demonstrated that there is a strong association between both geriatric syndromes and it is an expected finding. Depression can lead patients to a negative and pessimistic perception and can have a negative effect on the patient's capacity to cope with pain (37,38). In neurobiologic terms, the main noradrenergic and serotonergic nuclei in the central nervous system are responsible for the chronicity of pain and development of depression (39). Actually, the result we obtained from regression analysis might be affected from examining depression with only one simple question. Using validated depression examining questionnaires (for example; geriatric depression scale) might change the result.

Our study does not suggest an association between dependence in ADL and chronic pain. There are studies showing relationship between disability in ADL and chronic pain (40,41); but those were not specifically carried out on "oldest" people. We know that the prevalence of dependence in ADL increases with old age; and our study population consists of individuals older than 80 years who already had increased rates of comorbidities and baseline functional limitations, independent of pain factor. Therefore, this may be the cause of the result we found.

There was no significant association between chronic pain and cognitive dysfunction. There are studies showing association between pain and cognitive dysfunction (42). Pain perception can affect patients' cognitive performance. In addition, analgesic therapies can either cause cognitive impairment; or according to another theory, they can improve cognitive abilities by alleviating pain (43). Therefore, this finding can be explained with the possibilities that: (i) the ones with chronic pain might have been taken optimal pain treatment or (ii) their pain intensity might not be enough to affect cognitive abilities. In fact, further analysis is needed about this.

More patients were experiencing sleep disorders in chronic pain group than the others; but this result was not statistically significant. One may expect a relation between pain and sleep disturbance; as Jank et al. (44) found that 45.5% of the patients suffering from chronic pain were experiencing sleep disorders and chronic pain and older age were significantly associated with sleep problems. In fact, the assessment of sleep disturbance is completely subjective and prone to inacurate recall and memory bias; therefore, studies with more objective diagnostic measures (like polysomnography) are needed.

There were more constipated patients in pain group; but this result was not statistically significant. Chronic pain and constipation can be companions to each other under the title of central sensitization (36). Also, taking opioids can induce constipation in chronic pain sufferers (45). We know that irritable bowel syndrome can present both with chronic abdominal pain and constipation and it is expected to be diagnosed more in younger population (46). Also, in our daily practice, we do not easily start opioid treatment otherwise we encounter severe pain that does not answer to other less strong treatment choices. Further analysis with assessment of pain location, severity and treatment choices for pain is needed. In fact, the p value we obtained was 0.067; and with a larger study group, a significant relation may be found.

There were more malnourished patients in chronic pain group, as predicted by MNA-SF; but this result was not statistically significant. Chronic pain is associated with poor appetite, and since as many as half of all community dwelling older people suffer from chronic pain, this may contribute significantly to loss of appetite in older people (47). Actually, mini nutritional

assessment (MNA) evaluates not only appetite, but also psychological status, acute illnesses and body mass index (BMI) of individuals. Therefore, all items seperately can affect the results. Furthermore, obesity is a great cause of knee and back pain in older adults, but BMI more than 30 does not cause a reduction in MNA scores, as if patient is healthy in terms of nutrition. Therefore, anthropometric measurements may give more objective and accurate results on relationship between nutrition and chronic pain.

Polypharmacy was the most common geriatric syndrome in our study and was more prevalent in chronic pain sufferers; but this result was not statistically significant. Actually, patients dealing with chronic pain demand and use more medication than healthy individuals, and it can be expected to find a significant association between these two issues. In a Turkish study with 1000 community dwelling older adults, Ersoy and Engin (48) found that chronic pain was an independent risk factor for daily drug consumption in older patients. In fact, our study group consists of solely individuals older than 80 years. Also, our institution is a tertiary healthcare center and in our daily practice, we meet so many inappropriate medication use and prescription cascades. There are probably stronger factors associated with polypharmacy, rather than chronic pain in this population. Further detailed studies are needed.

Study Limitations

Our study has a few limitations. First of all, the sample size is small and consists of patients referred to a tertiary healthcare institution. Therefore, it does not represent the whole population. Secondly, evaluation of geriatric syndromes might be made in a more detailed way. For example, depression might be evaluated with geriatric depression scale and malnutrition with mini nutritional assessment long form. One other limitation is the fact that there is no objective way of detection of chronic pain. Patiens might not remember the pain experience and furthermore neglect it. Therefore, the results might be affected by subjective or recall bias. On the other hand, our study is important because it works on a special population, oldest old adults and contributes to the literature about a special topic in a comprehensive way.

Conclusion

In this study evaluating chronic pain and related factors in patients older than 80 years, we found a high prevalence of chronic pain and we suggest that female gender and frailty are independent factors associated with chronic pain experience in oldest adults. Indeed, further detailed studies are needed about this issue on this special age group. Chronic pain should not be seen as an inevitable part of ageing and should be taken into routine geriatric assessment and managed properly.

Ethics

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