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Original Article

Prevalence, characteristics and treatment of chronic pain in elderly patients hospitalized in internal medicine wards

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ABSTRACT

Background: Chronic pain is a frequent characteristic of elderly people and represents an actual and still poorly debated topic.
Objective: We investigated pain prevalence and intensity, and its pharmacological therapy in elderly patients hospitalized in 101 internal medicine wards.
Methods: Taking advantage of the "REgistro POliterapie Società Italiana Medicina Interna" (REPOSI), we collected 2535 patients of whom almost a quarter was older than 85 years old. Among them, 582 patients were affected by pain (either chronic or acute) and 296 were diagnosed with chronic pain.
Results: Patients with pain showed worse cognitive status, higher depression and comorbidities, and a longer duration of hospital stay compared to those without pain (all $p < .0366$). Patients with chronic pain revealed lower level of independency in their daily life, worse cognitive status and higher level of depression compared to acute pain patients (all $p < .0156$). Moreover, most of them were not treated for pain at admission (73.4%) and half of them was not treated with any analgesic drug at discharge (50.5%). This difference affected also the reported levels of pain intensity. Patients who received analgesics at both admission and discharge remained stable ($p = .172$). Conversely, those not treated at admission who received an analgesic treatment during the hospital stay decreased their perceived pain ($p < .0001$).
Conclusions: Our results show the need to focus more attention on the pharmacological treatment of chronic pain, especially in hospitalized elderly patients, in order to support them and facilitate their daily life after hospital discharge.

1. Introduction

The elderly population is progressively increasing worldwide and chronic pain represents a characteristic among 66% of people aged over 65 years old [1]. Women are generally more likely affected by chronic pain than men [1–3]. Management of chronic pain in the elderly is still challenging, due to several age-related physiological changes causing pharmacokinetic and pharmakodynamic issues [4], and to the wide spectrum of primary diseases and comorbidities that usually include such chronic conditions as impaired sensory and cognitive capacities, abnormal kidney and cardiovascular functioning [5–7], diabetes mellitus, hypertension [8], depression, hip fracture, stroke, colorectal and lung cancer [9]. Among the risk factors affecting mortality, comorbidities are considered equally important as the main disease, being present in approximately 89% of the discharged patients and in approximately 97% of those who died during the hospital stay [8]. Many of these comorbidities are themselves causes of pain. There is a wide agreement on the multidisciplinary approach necessary to assess and relieve pain in the elderly [10–14], since its inadequate recognition and treatment lead to a high probability of adverse negative outcomes such as functional impairment, falls, slower rehabilitation, mood alterations (e.g. depression and anxiety), reduction of socialization, deterioration of nutritional status, sleep disorders and overall a reduced quality of life [15,16]. Generally, from a pharmacological perspective, opioids are considered as the most powerful painkillers. An Italian study [17] based on the "REgistro POliterapie Società Italiana Medicina Interna" (REPOSI) showed that patients with chronic pain were prescribed with a rate of opioids prescription that increased from 3.8% to 5.8% when

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comparing admission with discharge. Moreover, more than 50% of patients were administered with five or more different drugs, highlighting that the prescription of opioids is often associated with polypharmacy. These co-treatments may induce new clinical issues due to drug-to-drug interactions or drug-related adverse events. For instance, sedation and respiratory depression might occur when opioids are administered together with anticonvulsants, benzodiazepines, antipsychotics, selective serotonin reuptake inhibitors and antidepressants. These interactions highlight a potential relation between opioid-related mortality and medicines commonly used for chronic pain [18]. Considering the need to increase knowledge on pain in the hospitalized elderly, we chose to analyze the data from REPOSI with the goal to investigate pain prevalence and intensity, and its pharmacological management in elderly patients hospitalized in internal medicine and geriatric wards, with a special focus on the subset of those with chronic pain.

2. Materials and methods

From January 2012 to December 2014, 101 centers (86 from Italy and 15 from Spain) participated in the REPOSI register, a collaborative network between the Italian Society of Internal Medicine (SIMI, Societa` Italiana di Medicina Interna), the IRCCS Mario Negri Institute of Pharmacological Research and the IRCCS Ca′ Granda Maggiore Policlinico Hospital Foundation. The design of REPOSI was previously described [19]. This network aims to assess the prevalence of multiple diseases and pharmacological treatments of elderly people hospitalized in internal medicine wards in order to describe the relation between the clinical characteristics of the patients and the appropriateness of prescribed drugs. Additionally, it aims to evaluate the clinical status and drug prescription at admission, discharge and 3-month follow-up, the latter being verified by phone calls. The REPOSI network enrolled patients consecutively admitted to the participating hospital wards during a period of 4 weeks, 3 months apart from each other (in February, June, September, December 2012 and 2014). Inclusion criteria were age ≥ 65 years old and acceptance to sign the informed consent. Exclusion criteria included seriousness of patient's clinical condition and admission in terminal state. Participants signed the informed consent approved by the ethics committee of the IRCCS Ca′ Granda Maggiore Policlinico Hospital Foundation, Milan. 2535 patients were enrolled (2366 Italian and 169 Spanish). Among them, 5 were excluded because of missing information on the main outcome (pain), and 19 because they had post-operative pain, that is different in nature and treatment compared to chronic pain. Table 1 shows the social, educational, and clinical characteristics of the examined sample, distinguishing the general participants from those with pain, acute or chronic. Additionally, with the goal to evaluate the evolution of chronic pain from admission to discharge, we further excluded 63 patients because death occurred during hospitalization, transfer or missing data, and 124 patients who reported pain at admission but not at discharge.

All the collected data were monitored by a central institution (Mario Negri Institute) for consistency, accuracy (with contacts of the peripheral clinical centers if necessary) and statistical analysis.

2.1. Data collection

All data obtained during the visits were entered into a standardized web-based case report form by the physician who attended the assessment. All the personnel involved in data collection was trained prior to the starting date in order to standardize the procedure of patient inclusion and evaluation. The following data were recorded for each patient: socio-demographic characteristics, body mass index, risk factors, severity and comorbidity index, cognitive functioning assessment, duration of hospital stay, state of patients at discharge and pharmacological therapy. Moreover, we recorded both the intensity and nature (acute vs. chronic) of pain. The evaluating tools and diagnosis classifications are described elsewhere [19].

The pharmacological therapy was encoded according to the Anatomical Therapeutic Chemical (ATC) classification system and gathered into different categories of prescribed drugs: nonsteroidal anti-inflammatory drugs (NSAIDs, such as aspirin, ibuprofen, ketorolac, ketoprofen, COX2-inhibitors), paracetamol, opioids (WHO step 2, weak opioids such as codeine and tramadol; WHO step 3, strong opioids such as morphine, hydromorphone, methadone, fentanyl, oxycodone) adjuvant analgesics (such as tricyclic antidepressants, anticonvulsants, corticosteroids, bisphosphonates).

The nature of pain (acute vs. chronic) was first assessed by the physician and then patients were asked to rate the level of perceived pain on a numeric rating scale (NRS), ranging from 0 (no pain) to 10 (the worst imaginable pain).

2.2. Statistical analysis

Characteristics of patients with or without pain, and those with acute or chronic pain were compared using univariate analysis by means of chi-squared tests for categorical variables, and *t*-tests or analysis of variance (ANOVA) for continuous variables. The odds ratio (ORs) for patients administered with analgesic treatment compared to those not treated were analyzed using logistic regression models adjusting for age, sex, type of pain, functional and cognitive status, and depression. Analyses were performed using JMP Pro 13 (SAS Institute Inc. Cary. NC. USA) and Stata 13.0 (Stata Corp LP, College Station, Texas, USA). *P*-values < .05 were considered statistically significant.

3. Results

Results showed that among 2511 patients eligible for the analysis, 659 suffered from pain and 1852 did not (see the flow-chart, Fig.1).

Among those with pain, 54.2% were women and pain patients differed from those without pain for living arrangements ($p < .0001$) and sex distribution ($p = .0061$). Patients suffering from pain showed worse cognitive status ($p = .0366$), higher levels of depression ($p = .0004$) and number of comorbidities ($p = .0004$), and a longer duration of hospital stay ($p = .0026$) compared to those who did not report pain (Table 1). Among 582 patients with pain, those with acute pain were comparable in number to those with chronic pain (286 and 296, respectively). There were lower level of independency in the activities of daily life ($p < .0001$), worse cognitive status ($p = .0156$) and higher level of depression ($p = .0112$) in the chronic pain compared with the acute pain population (Table 1).

The multivariate analysis to check any possible influencing role of geriatric assessment variables in the administration of analgesic treatment showed that the worse the cognitive status, the lower the probability to be administered with WHO2 opioids ($p = .005$), and that the better the functional status, the higher the probability to be administered with WHO3 opioids ($p = .020$). However, no additional significances were found (Supplementary Data, Supplementary Table).

By focusing on chronic pain patients who reported pain at both admission and discharge ($N = 109$), most of them were not treated for pain at the time of admission (73.4%). The remaining patients were already treated at admission with one analgesic drug (i.e. monotherapy, 22%) or with two or more drugs (i.e. polytherapy, 4.6%). At discharge, half of the chronic pain patients received no analgesic prescription (50.5%), the other half received a monotherapy (33.9%) or polytherapy (14.7%) analgesic prescription.

By analyzing the type of analgesics, most chronic pain patients were treated with WHO-step 3 drug at admission (11.9%) but with WHO-step 2 during the hospital stay (19.2%) and at discharge (17.6%) (Fig.2).

Our analysis on pain intensity showed a slight decrease in pain reports comparing admission (NRS pain average 4.9) with discharge (NRS pain average 4.7), although the difference was not statistically significant ($p = .1532$). Those patients who received an analgesic