Pain Management in Frail, Community-Living Elderly Patients

Francesco Landi, MD, PhD; Graziano Onder, MD; Matteo Cesari, MD; Giovanni Gambassi, MD; Knight Steel, MD; Andrea Russo, MD; Fabrizia Lattanzio, MD, PhD; Roberto Bernabei, MD; for the SILVERNET-HC Study Group

Background: Pain is a common problem among older people living in different community settings. As indicated by the World Health Organization (WHO), pain can be relieved using pharmacologic agents. However, pain continues to be addressed inadequately.

Objectives: To describe the prevalence of pain in frail elderly people living in the community and to evaluate the adequacy of pain management.

Methods: We analyzed data from a large collaborative observational study group, the Italian Silver Network Home Care project, that collected data on patients admitted to home health care programs. Twelve home health care agencies participated in the project evaluating the implementation of the Minimum Data Set for Home Care instrument. We enrolled 3046 patients, 65 years and older, in the present study. The main outcome measures were the prevalence of daily pain and analgesic treatment.

Results: A total of 1341 individuals (39%, 49%, and 41% of those aged 65-74, 75-84, and ≥85 years, respectively) reported daily pain. Of patients with daily pain, 25% received a WHO level 1 drug; 6%, a WHO level 2 drug; and 3%, a WHO level 3 drug (eg, morphine sulfate). Patients 85 years or older were less likely to receive analgesics compared with the younger patients (univariate odds ratio, 0.73; 95% confidence interval [CI], 0.60-0.89). Another independent predictor of failing to receive any analgesic was low cognitive performance (adjusted odds ratio, 0.80; 95% CI, 0.69-0.93).

Conclusions: Daily pain is prevalent among frail elderly patients living in the community and is often untreated, particularly among older and demented patients.

Arch Intern Med. 2001;161:2721-2724

Pain is a common problem among older people, with studies reporting a prevalence ranging from 45% to 80%, depending on age, the population studied, and the site of residence.1-5 Despite the widespread dissemination of the 3-level ladder of the World Health Organization (WHO)6 and the demonstration that pain can be alleviated in more than 90% of cases,5,6 pain continues to be inadequately addressed.7,8 Even patients with cancer, in whom pain might be most readily recognized, frequently receive poor treatment for pain.9 Furthermore, the needs of persons in some settings appear to be addressed especially inadequately, even when medical staff recognize that the patients are in pain. A recent study among residents of nursing homes with cancer found that one quarter of the patients did not receive any analgesic despite daily pain, and those older than 85 years were even less likely to receive analgesics.10

Although no physiological basis exists for a decrease in the sensation or intensity of pain with increasing age, pain is believed to be less prevalent among the elderly. Thus, pain is historically underreported and undertreated in this group. The aims of the present study were to ascertain the prevalence of pain in a frail, older population living in the community and to determine how their pain was addressed.

Results: A total of 1341 individuals (39%, 49%, and 41% of those aged 65-74, 75-84, and ≥85 years, respectively) reported daily pain. Of patients with daily pain, 25% received a WHO level 1 drug; 6%, a WHO level 2 drug; and 3%, a WHO level 3 drug (eg, morphine sulfate). Patients 85 years or older were less likely to receive analgesics compared with the younger patients (univariate odds ratio, 0.73; 95% confidence interval [CI], 0.60-0.89). Another independent predictor of failing to receive any analgesic was low cognitive performance (adjusted odds ratio, 0.80; 95% CI, 0.69-0.93).

Conclusions: Daily pain is prevalent among frail elderly patients living in the community and is often untreated, particularly among older and demented patients.

Arch Intern Med. 2001;161:2721-2724

The principal characteristics of the study population are shown in Table 1. Patients were white and predominately female (59%), with a mean age of 78.3 ± 8.9 years. More than 67% of the individuals were 75 years or older. Overall, patients had a moderate-to-severe impairment in...
SUBJECTS AND METHODS

ASSESSMENT OF PAIN AND ANALGESIA

We conducted this study using the database of the Silver Network Home Care project (SILVERNET-HC), a national home health care program based in Italy. The database is population based, longitudinal, and multilinked and consists of data collected using the Minimum Data Set for Home Care (MDS-HC) instrument from more than 3000 patients in more than 12 home health care agencies in Italy, and data on all medications used by each patient at the time of the MDS-HC assessment. Drugs were coded using the Anatomical Therapeutic and Chemical codes.

The MDS-HC contains more than 350 data elements, including sociodemographic variables, numerous clinical items about physical and cognitive status, and all clinical diagnoses. The MDS-HC also includes information about an extensive array of signs, symptoms, syndromes, and treatments being provided. A variety of different, multi-item summary scales are embedded in the MDS-HC that measure, eg, physical function (activities of daily living and instrumental activities of daily living) and cognitive status (Cognitive Performance Scale). The MDS-HC items have been found to have excellent interrater and test-retest reliability when completed by nurses performing usual assessment duties (average weighted \( \kappa = 0.8 \)).

The study population consisted of all patients admitted to home health care programs in 12 home health care agencies from January 1, 1997, through December 31, 1999, who participated in the SILVERNET-HC project (n=3312). Patients younger than 65 years (n=130) and those who were admitted to the home health care programs before the implementation of MDS-HC (n=156) were excluded. As a result, the final analysis sample included 3046 patients.

A multidisciplinary team of professionals (general practitioners, nurses, and a geriatrician) evaluated signs and symptoms of pain. Daily pain was defined as any type of physical pain or discomfort in any part of the body that was manifest daily during the 7 days preceding the assessment. The assessors were instructed to ask simple and direct questions about whether the patients experienced pain. Because some patients had limited verbal communication, the assessors were also instructed to observe such persons for indications of pain, including moaning, crying, wincing, frowning, other facial expressions, or posturing, such as guarding or protecting an area of the body. Independent, dual assessments of pain items in a diverse sample of patients in nursing homes during the testing and revision of the MDS-HC showed an average weighted \( \kappa \) exceeding 0.7, and similar \( \kappa \) values were obtained when the MDS-HC was studied for reliability.

We collected data about use of analgesics, directly from general practitioners. Analgesics were classified into 3 different groups according to the WHO 3-step ladder, including nonopioids (level 1; eg, salicylates and nonsteroidal anti-inflammatory drugs), weak opioids (level 2; eg, codeine phosphate, pentazocine hydrochloride, and butorphanol tartrate), and strong opioids (level 3; eg, morphine sulfate, hydromorphone hydrochloride, fentanyl citrate, and methadone hydrochloride).

STATISTICAL ANALYSIS

Data were analyzed first to obtain descriptive statistics. Continuous variables are presented as means±SD. We evaluated age trends of sociodemographic variables and indicators of disease severity using the Fisher exact test. Differences between continuous variables were assessed by means of analysis of variance comparisons for normally distributed variables; otherwise, we adopted the Kruskal-Wallis test. We chose the \( P < .05 \) level for statistical significance.

To identify predictors of analgesic use, we selected a sample of patients with daily pain and constructed a multiple logistic regression model, with use of analgesics as the dependent variable of interest. Potential predictors included age, sex, functional and cognitive status, and comorbidity. These were adjusted for confounding by a number of possible contraindications to pharmaceutical treatment. The instrumental activities of daily living score was excluded from the multivariate analysis to limit the confounding effect of collinearity with the activities of daily living score. We have not considered socioeconomic factors because the Italian National Health Plan provides universal coverage, including drugs. In fact, the health budget is funded by general tax income and a special tax. From the final model, we derived odds ratios (ORs) and corresponding 95% confidence intervals (CIs).

Statistical analyses were performed using commercially available software (SPSS; SPSS Inc, Chicago, Ill).

basic and instrumental activities of daily living; similarly, cognitive function was compromised in many patients (<35% showed a Cognitive Performance Scale score of >2, indicating moderate to severe cognitive impairment). An explicit terminal prognosis was indicated in 5% of patients. Daily pain was recorded in 40% of patients aged 65 to 74 years, 49% in those aged 75 to 84 years, and 41% in those 85 years and older.

Of the 1341 individuals who reported having daily pain, 27% received analgesics. Level 1 analgesics were used by 25% of patients in pain. Levels 2 and 3 opiates were administered to only 6% and 3% of patients in pain, respectively. The Figure shows the relationship between age and analgesic use. As age increased, a lower proportion of patients in pain received analgesic drugs (33%, 26%, and 21% of patients aged 65-74, 75-84, and ≥85 years, respectively; \( P < .001 \) for age trend). This trend was evident for the 3 different classes of analgesics. The use of morphine or other strong opiates was relatively uncommon in all age groups. In particular, only 1% of patients 75 years and older received this class of drugs compared with 5% of patients aged 65 to 74 years (\( P < .001 \)).

Table 2 shows predictors of analgesic use among persons with daily pain. Patients 85 years or older were less likely to receive analgesics, compared with the younger patients (OR, 0.73; 95% CI, 0.60-0.89). This association remained significant in a multivariable model adjusting for several variables, including sex, functional and cognitive status, indicators of disease severity (eg, explicit terminal prognosis and comorbidity), and pos-
Many explanations have been offered to explain poor assessment of pain and inadequate treatment in this age group. Some authors have suggested that older patients have less knowledge about pain management and a disproportionately fear of addiction. A recent study among patients with cancer in nursing homes found that as many as 37% had unrelieved pain. One quarter of patients did not receive any analgesics, despite daily pain; and patients older than 85 years and nonwhite patients were even less likely to receive analgesics. Age per se seems to be a predictor of poor pain management. Cleeland et al reported that even outpatients 70 years or older with cancer were less likely to receive analgesic treatment when compared with younger populations. Although cultural differences might be invoked to explain some of our results, other factors certainly contributed to such striking findings. Thus, some special characteristics of home health care patients, payment mechanisms, state regulation, and restriction on prescription of opioids likely are factors in so large a sample of frail elderly patients receiving inadequate care.

Inadequate attention to pain control is unethical, clinically unacceptable, and wasteful in terms of cost. Phillips has reported that appropriate pain management results in quicker clinical recovery, shorter hospital stays, fewer readmissions, and improved quality of life. As indicated by the WHO, almost all patients with daily pain can be adequately treated by means of simple oral regimens that usually do not produce adverse effects.

To begin to address this problem in the United States, the Joint Commission on Accreditation of Healthcare Organizations has issued pain management guidelines. They emphasize the importance of a collaborative and interdisciplinary team in pain management and the need to perform a reliable assessment and reassessment of each patient’s pain with subsequent planning of an individualized pain control program. Such a program would include the use of pharmacologic and nonpharmacologic strategies. Finally, experts agree that a need exists to educate individual clinicians and even patients to influence their behavior with respect to pain.

We recognize some limitations of our study. Although the MDS-HC is a standardized, comprehensive assessment instrument, the recording of pain is not a specific focus. Pain was assessed by the home health care general staff (including the general practitioner), and this process might have been complicated, especially for patients who are not able to self-report. Furthermore, many factors may contribute to inadequate pain management, including limited assessment tools, clinician fear of addiction, and limited access to effective analgesics.

The results of the present study show that more than 40% of elderly patients living in the community experienced daily pain. Only one quarter of these individuals received analgesics of any kind. Patients 85 years or older were even less likely to receive analgesics than the younger elderly population. Individuals with cognitive impairment were also at greater risk for receiving no analgesics than were the nonimpaired population. Elderly subjects and patients with cognitive impairment may receive inadequate analgesia in part due to an underestimation and underreporting of pain. However, the observation that older and demented persons were at greater risk for undertreatment is especially concerning, since it has been documented in previous studies.

Many explanations have been offered to explain poor assessment of pain and inadequate treatment in this age group. Some authors have suggested that older patients have less knowledge about pain management and a disproportionately fear of addiction. A recent study among patients with cancer in nursing homes found that as many as 37% had unrelieved pain. One quarter of patients did not receive any analgesics, despite daily pain; and patients older than 85 years and nonwhite patients were even less likely to receive analgesics. Age per se seems to be a predictor of poor pain management. Cleeland et al reported that even outpatients 70 years or older with cancer were less likely to receive analgesic treatment when compared with younger populations. Although cultural differences might be invoked to explain some of our results, other factors certainly contributed to such striking findings. Thus, some special characteristics of home health care patients, payment mechanisms, state regulation, and restriction on prescription of opioids likely are factors in so large a sample of frail elderly patients receiving inadequate care.

Inadequate attention to pain control is unethical, clinically unacceptable, and wasteful in terms of cost. Phillips has reported that appropriate pain management results in quicker clinical recovery, shorter hospital stays, fewer readmissions, and improved quality of life. As indicated by the WHO, almost all patients with daily pain can be adequately treated by means of simple oral regimens that usually do not produce adverse effects.

To begin to address this problem in the United States, the Joint Commission on Accreditation of Healthcare Organizations has issued pain management guidelines. They emphasize the importance of a collaborative and interdisciplinary team in pain management and the need to perform a reliable assessment and reassessment of each patient’s pain with subsequent planning of an individualized pain control program. Such a program would include the use of pharmacologic and nonpharmacologic strategies. Finally, experts agree that a need exists to educate individual clinicians and even patients to influence their behavior with respect to pain.

We recognize some limitations of our study. Although the MDS-HC is a standardized, comprehensive assessment instrument, the recording of pain is not a specific focus. Pain was assessed by the home health care general staff (including the general practitioner), and this process might have been complicated, especially for patients who are not able to self-report. Furthermore, many factors may contribute to inadequate pain management, including limited assessment tools, clinician fear of addiction, and limited access to effective analgesics.

The results of the present study show that more than 40% of elderly patients living in the community experienced daily pain. Only one quarter of these individuals received analgesics of any kind. Patients 85 years or older were even less likely to receive analgesics than the younger elderly population. Individuals with cognitive impairment were also at greater risk for receiving no analgesics than were the nonimpaired population. Elderly subjects and patients with cognitive impairment may receive inadequate analgesia in part due to an underestimation and underreporting of pain. However, the observation that older and demented persons were at greater risk for undertreatment is especially concerning, since it has been documented in previous studies.

Many explanations have been offered to explain poor assessment of pain and inadequate treatment in this age group. Some authors have suggested that older patients have less knowledge about pain management and a disproportionately fear of addiction. A recent study among patients with cancer in nursing homes found that as many as 37% had unrelieved pain. One quarter of patients did not receive any analgesics, despite daily pain; and patients older than 85 years and nonwhite patients were even less likely to receive analgesics. Age per se seems to be a predictor of poor pain management. Cleeland et al reported that even outpatients 70 years or older with cancer were less likely to receive analgesic treatment when compared with younger populations. Although cultural differences might be invoked to explain some of our results, other factors certainly contributed to such striking findings. Thus, some special characteristics of home health care patients, payment mechanisms, state regulation, and restriction on prescription of opioids likely are factors in so large a sample of frail elderly patients receiving inadequate care.

Inadequate attention to pain control is unethical, clinically unacceptable, and wasteful in terms of cost. Phillips has reported that appropriate pain management results in quicker clinical recovery, shorter hospital stays, fewer readmissions, and improved quality of life. As indicated by the WHO, almost all patients with daily pain can be adequately treated by means of simple oral regimens that usually do not produce adverse effects.

To begin to address this problem in the United States, the Joint Commission on Accreditation of Healthcare Organizations has issued pain management guidelines. They emphasize the importance of a collaborative and interdisciplinary team in pain management and the need to perform a reliable assessment and reassessment of each patient’s pain with subsequent planning of an individualized pain control program. Such a program would include the use of pharmacologic and nonpharmacologic strategies. Finally, experts agree that a need exists to educate individual clinicians and even patients to influence their behavior with respect to pain.

We recognize some limitations of our study. Although the MDS-HC is a standardized, comprehensive assessment instrument, the recording of pain is not a specific focus. Pain was assessed by the home health care general staff (including the general practitioner), and this process might have been complicated, especially for patients who are not able to self-report. Furthermore, many factors may contribute to inadequate pain management, including limited assessment tools, clinician fear of addiction, and limited access to effective analgesics.

Table 1. Descriptive Analysis of Baseline Sociodemographic, Functional, and Clinical Variables by Age*  

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total (N = 3046)</th>
<th>65-74 (n = 994)</th>
<th>75-84 (n = 1175)</th>
<th>≥85 (n = 777)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>1810 (59)</td>
<td>519 (52)</td>
<td>706 (60)</td>
<td>585 (67)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>1372 (45)</td>
<td>355 (36)</td>
<td>603 (51)</td>
<td>234 (29)</td>
</tr>
<tr>
<td>Widowed</td>
<td>1265 (42)</td>
<td>300 (30)</td>
<td>455 (39)</td>
<td>510 (58)</td>
</tr>
<tr>
<td>Never married</td>
<td>409 (13)</td>
<td>159 (16)</td>
<td>117 (10)</td>
<td>133 (15)</td>
</tr>
<tr>
<td>Living alone</td>
<td>559 (18)</td>
<td>122 (12)</td>
<td>243 (21)</td>
<td>194 (22)</td>
</tr>
<tr>
<td>Explicit terminal illness</td>
<td>149 (5)</td>
<td>64 (6)</td>
<td>51 (4)</td>
<td>34 (4)</td>
</tr>
<tr>
<td>ADL score, mean ± SD†</td>
<td>4.3 ± 2.5</td>
<td>3.8 ± 2.6</td>
<td>4.2 ± 2.5</td>
<td>5.0 ± 2.0</td>
</tr>
<tr>
<td>IADL score, mean ± SD‡</td>
<td>4.8 ± 2.1</td>
<td>4.5 ± 2.1</td>
<td>4.8 ± 2.1</td>
<td>5.0 ± 2.0</td>
</tr>
<tr>
<td>CPS score, mean ± SD§</td>
<td>2.3 ± 2.2</td>
<td>1.7 ± 2.1</td>
<td>2.3 ± 2.1</td>
<td>3.1 ± 2.1</td>
</tr>
<tr>
<td>No. of diseases, mean ± SD</td>
<td>3.2 ± 2.3</td>
<td>2.7 ± 1.9</td>
<td>3.3 ± 2.3</td>
<td>3.5 ± 2.5</td>
</tr>
<tr>
<td>No. of medications, mean ± SD</td>
<td>3.5 ± 2.5</td>
<td>3.6 ± 2.9</td>
<td>3.6 ± 2.5</td>
<td>3.3 ± 2.4</td>
</tr>
<tr>
<td>Daily pain****</td>
<td>1341 (44)</td>
<td>397 (40)</td>
<td>581 (49)</td>
<td>363 (41)</td>
</tr>
</tbody>
</table>

*Data are given as number (percentage) unless otherwise indicated. ADL indicates activities of daily living; IADL, instrumental ADL; and CPS, Cognitive Performance Scale.  
†Indicates conditions with less than 6 months of expected survival.  
‡Indicates a range of 0 to 7. A higher number indicates higher impairment.  
§Indicates a range of 0 to 6. A higher number indicates higher impairment.  
****Patient complains of or shows evidence of pain daily.
patients with difficulty communicating. Furthermore, we did not attempt to identify the site of pain or make an attribution as to its specific cause.

Our data suggest that in the community, analgesics are infrequently prescribed to elderly patients. To identify patients in pain, the MDS-HC assessment tool can be used by home health care staff and general practitioners. After a specific intervention is instituted, a second assessment should be performed, thereby allowing observations to be made on the efficacy of the treatment plan. Furthermore, research is needed to explore the potential use of MDS-HC data to target diagnostic evaluation and to monitor the appropriateness of therapies for daily pain in community setting. A failure to make all reasonable efforts to treat pain successfully should be considered one of the most important indicators of poor quality of health care.

Accepted for publication April 18, 2001.

This study was supported by a grant from the Progetto Finalizzato Invecchiamento of the National Research Council, Rome, Italy, and from Pfizer Italiana SpA, Rome.

The SILVERNET-HC Study Group includes the following: Roberto Bernabei, MD, Pierugo U. Carbonin, MD, and Maria P. Ruffilli, MD (Steering Committee); Francesco Landi, MD, PhD, and Fabrizia Lattanzio, MD (Co-ordination); and Giovanni Gambassi, MD, Andrea Russo, MD, Matteo Cesari, MD, Luca Manigrasso, MD, Francesco Pagano, MD, Maria G. Di Niro, MD, Graziano Onder, MD, and Antonio Sgadari, MD (Writing Panel).

Corresponding author and reprint requests: Francesco Landi, MD, PhD, Istituto di Medicina Interna e Geriatria, Centro Medicina dell’Invecchiamento (C.E.M.I.), Università Cattolica del Sacro Cuore, Largo Agostino Gemelli, 8, 00168 Rome, Italy (e-mail: francesco_landi@rm.unicatt.it).

Table 2. Predictors of Receiving Analgesia Among Patients With Daily Pain*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Analgesia (n = 363)</th>
<th>No Analgesia (n = 978)</th>
<th>Univariate Odds Ratio (95% CI)</th>
<th>Adjusted Model Odds Ratio† (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65-74</td>
<td>153</td>
<td>317</td>
<td>1.00 (1.00)</td>
<td>1.00 (Referent)</td>
</tr>
<tr>
<td>75-84</td>
<td>139</td>
<td>390</td>
<td>1.01 (0.84-1.18)</td>
<td>1.01 (0.84-1.20)</td>
</tr>
<tr>
<td>≥85</td>
<td>71</td>
<td>271</td>
<td>0.73 (0.60-0.89)</td>
<td>0.78 (0.63-0.96)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>133</td>
<td>370</td>
<td>1.00 (1.00)</td>
<td>1.00</td>
</tr>
<tr>
<td>Female</td>
<td>230</td>
<td>608</td>
<td>1.02 (0.90-1.16)</td>
<td>1.08 (0.94-1.23)</td>
</tr>
<tr>
<td>Explicit terminal illness</td>
<td>48</td>
<td>37</td>
<td>1.96 (1.57-2.46)</td>
<td>1.88 (1.49-2.38)</td>
</tr>
<tr>
<td>Compromised activities of daily living function‡</td>
<td>288</td>
<td>810</td>
<td>0.89 (0.77-1.04)</td>
<td>0.98 (0.83-1.16)</td>
</tr>
<tr>
<td>Impaired cognitive performance§</td>
<td>95</td>
<td>365</td>
<td>0.76 (0.67-0.87)</td>
<td>0.80 (0.69-0.93)</td>
</tr>
</tbody>
</table>

CI indicates confidence interval.
†Adjusted simultaneously for all of the variables listed and for confounding by possible contraindications to pharmaceutical treatment (eg, gait problems, constipation, fecal impaction, hallucinations, vomiting, problems swallowing, dizziness, and chronic obstructive pulmonary disease).
‡Activities of daily living score is at least 2 (range, 0-7; a higher number indicates higher impairment).
§Cognitive performance scale score is at least 2 (range, 0-6; a higher number indicates higher impairment).

CONCLUSIONS