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Role of Pain Medications, Consultants, and Other Services in Improved Pain Control of Elderly Adults with Cancer in Geriatric Evaluation and Management Units

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Abstract

OBJECTIVES—To determine whether pain medication use and inpatient consultations and services were associated with significantly better pain control.

DESIGN—Secondary data analysis from a randomized two-by-two factorial trial. Hospitalized, frail individuals aged 65 and older were randomized to receive care in a geriatric inpatient unit, a geriatric outpatient clinic, both, or neither.

SETTING—Eleven Veterans Affairs Medical Centers.

PARTICIPANTS—Ninety-nine individuals with a diagnosis of cancer, excluding nonmelanoma skin cancer; 44 received geriatric evaluation and management unit (GEMU) care and 55 usual care.

MEASUREMENTS—Pain medications were measured at baseline and discharge; consultations and other services were quantified for the entire admission.

RESULTS—Participants receiving GEMU care had a significantly higher number of consultations than those in usual care. Participants in GEMU care received psychiatry, endocrinology, and psychology consultations 12.7% ($P = .004$), 9.1% ($P = .04$), and 21.8% ($P = .05$) times more, respectively, and occupational and physical therapy 27.3% ($P = .004$) and 18.2% ($P = .04$) more, respectively. There were no significant differences in pain medication use between intervention and usual care.

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CONCLUSION—Significantly greater use of psychology, psychiatry, physical and occupational therapy in the GEMU participants may have improved the effectiveness of pain management in individuals in inpatient GEMUs. Although analgesic use was not significantly different between the GEMU and usual care groups, small sample size may have limited the ability to detect these differences.

Keywords

cancer; pain control; geriatric units

The number of older adults continues to increase in the United States. According to the Census Bureau's projections, nearly one in five Americans will be aged 65 and older in 2030, compared with approximately one in eight in 2010.¹ The majority of individuals with cancer are elderly. Projections suggest that approximately 60% of cancer incidence and 70% of cancer-related mortality will occur in individuals aged 65 and older.^{2,3}

The burden of pain in individuals with cancer is well documented.⁴ Fatigue, pain, and distress are the most commonly reported symptoms, according to multiple studies, and this has been poorly studied in elderly adults.^{5–7} Inadequately controlled pain can adversely affect individuals and their families. The World Health Organization (WHO), international and national professional organizations, and governmental agencies have stressed the importance of pain management as part of routine cancer care.^{4,8} Limited attention has been paid to the management of cancer pain treatment with a focus on the elderly population. Although older adults are less likely to report pain, there are no data supporting a change in pain perception. Depression, cognitive impairment, and other comorbidities may play a part in this underreporting.⁹ Pain severity directly correlates with basic and instrumental activity of daily living disability.¹⁰

Comprehensive geriatric assessment has been shown to aid in care management, with some evidence of applicability to the care of elderly adults with cancer.^{11,12} A geriatric evaluation and management unit (GEMU) is a specialized program of services provided by an interdisciplinary team of healthcare professionals usually consisting of a geriatrician, a social worker, and a nurse. These services are targeted for older adults who have geriatric conditions that benefit from geriatric evaluation and management, such as problems with functional status, gait balance and risk for falls, polypharmacy, cognitive status, affective status, nutritional status, pain, and social function. Such services may be provided in an inpatient or out-patient setting and include evaluation and management components. It has been demonstrated that inpatient GEMUs positively influence bodily pain, mental health, and functional status.¹³

A previous study of a subset of individuals with cancer from the above-mentioned randomized controlled trial comparing inpatient GEMUs with usual inpatient care showed a substantial improvement in pain control that was sustained at 1 year regardless of the type of outpatient care.¹⁴ The reasons for this positive effect are unknown, but it was hypothesized that it might be related to better pain assessment and management, better interdisciplinary care, and more-effective use of physical and occupational therapy and other supportive services.

METHODS

Study Design

The parent trial for the current study was the Veterans Affairs (VA) Cooperative trial “A Controlled Trial of Inpatient and Outpatient Geriatric Evaluation and Management.” The

results and details of the study have previously been published.¹³ The current study is a secondary data analysis of all of the participants with cancer identified within this trial.¹⁴

The study sample and intervention and outcome follow-up data for this cohort have been previously reported.^{13,14} Bodily pain was measured using the Medical Outcomes Study 36-Item Short-Form general health survey (SF-36) at baseline and discharge.¹⁵ Information on baseline bodily pain was obtained at the time of randomization to the usual care or GEMU arm of the study. A normalized bodily pain score was obtained using the bodily pain items in the SF-36: “How much bodily pain have you had during the past 4 weeks?” “During the past 4 weeks, how much did pain interfere with your normal activities (including both inside and outside your home)?”

Other secondary outcomes were health services use and costs, measured according to information collected from the decentralized hospital computer program at each site, centralized VA databases, and Medicare databases.¹⁶

Data on inpatient and outpatient medications were collected as previously described.^{17,18} Baseline medications were the medications that participants were taking during the hospital admission at the time that they were randomized to the usual care or GEMU arm of the study. Baseline medication use and the change in medication use from baseline to discharge were assessed. Data were analyzed for inpatient consultant usage to assess the difference between the GEMU group and the usual care group. Similarly, data were assessed regarding other inpatient services available to each arm of the study.

Data Analysis

The primary data analysis strategy in this study explored potential reasons why participants with cancer randomized to the GEMU group reported better pain scores at discharge than the usual care group in a previous study.¹⁴ The primary source data allowed potential differential medication use, consultations, and other services to be queried according to randomization group.

Baseline Characteristics

The descriptive characteristics of the groups were compared using chi-square or Student *t*-tests, as appropriate.

Pain Medications

The use of analgesics and adjuvant agents with effects on pain was obtained at baseline and discharge.^{17,18} Individual medications at baseline and discharge were grouped into therapeutic classes according to the VA Medication Classification System.¹⁹ Participants were then categorized at each time as to whether they were receiving any drug in each of the pain medication groups. The therapeutic classes included salicylates, nonsteroidal anti-inflammatory drugs (NSAIDs), opiates, corticosteroids, tricyclic antidepressants, benzodiazepines, antipsychotics, selective serotonin reuptake inhibitors (SSRIs), sedatives and hypnotics, and amphetamines. The rationale for including tricyclic antidepressants, benzodiazepines, antipsychotics, SSRIs, and sedatives and hypnotics is that these are considered adjuvant medicines that aid in cancer pain relief.^{4,8} To assess the differences for each therapeutic class in the change between randomization groups (GEMU vs usual care), the McNemar odds on change were first calculated separately for each of the two randomization groups. The difference in the odds between randomization groups was then calculated according to the ratio of the relative McNemar odds. This odds ratio can be interpreted as the greater odds of a positive effect in the GEMU group than in the usual care

group. The significance of the resulting odds ratio was computed using the Pearson chi-square statistic.

In addition, the number of drug groups that a participant was taking was calculated at each time point, and the difference was calculated between discharge and baseline. The groups (GEMU vs usual care) were evaluated for this difference using the Student *t*-test.

Inpatient Consultations and Services

Inpatient use of consultations and services for the entire hospitalization were analyzed as cross-sectional data. Chi-square analysis was used to evaluate the difference between randomization groups for the proportion of consultations and services that a participant was using.

The number of consultations and other services that a participant was using was calculated, and the groups (GEMU vs usual care) was evaluated for this difference using the Student *t*-test. All analyses were conducted using SAS version 9.2 (SAS Institute, Inc., Cary, NC).

RESULTS

Ninety-nine individuals with cancer were identified; 44 were in the inpatient GEMU group and 55 in the usual care group. As previously reported, the demographics of the participants with cancer collected at baseline did not differ between the groups except for greater frequency of retired people in the usual care group.¹⁴ Of these 99 participants, 25 had prostate cancer, 16 lung cancer, 11 hematologic malignancies, 10 colon or other gastrointestinal tumors, 10 ill-defined malignancies (including metastatic adenocarcinoma of unknown primary), six head and neck cancer, and six bladder or renal cancer. Fifteen participants had a diagnosis of secondary cancer with bony metastasis. All of the 99 participants with cancer were tracked successfully for 1 year or until death.¹⁴ Of all potential follow-up telephone interviews at 6 and 12 months, 99% were obtained successfully.

There was no difference in pain occurrence according to tumor type, although data were not available on cancer stage or duration. The 15 participants who were reported to have bony metastases were well distributed between the study groups (GEMU: *n* = 5, 11.4%; usual care: *n* = 10, 18.2%; *P* = .35). Of the 99 participants with cancer, 52 (53%) reported severe to very severe pain, and another 20 (20%) reported moderate pain; 56 (57%) participants reported that the pain interfered with their activities quite a bit or extremely. The proportion of participants with severe pain decreased (from baseline to discharge) 55% in the GEMU group and 19% in the usual care group (*P* = .04), consistent with the decrease in overall pain score previously reported.¹⁴ The proportion of participants with moderate pain decreased (from baseline to discharge) 42% in the GEMU group and 34% in the usual care group (*P* = .42).

Pain Medication Use

There were no significant differences in pain medication use (baseline to discharge) between the GEMU and usual care groups (Table 1). There was a trend toward greater use of NSAIDs in the GEMU group (9.1% increase) than in usual care (0% change, *P* = .16). There was no change (baseline to discharge) between the two groups in the percentage of participants who used opioids. The mean number of prescribed analgesic groups (NSAIDs, benzodiazepines, narcotics, tricyclic antidepressants, corticosteroids, salicylates, acetaminophen, and hypnotics and sedatives) was assessed (Table 1). There was no significant change (baseline to discharge) in the mean number of prescribed analgesic groups in the GEMU or usual care groups (*P* = .14) (Table 1).

Consultations and Services

GEMU inpatients had a significantly higher mean number of consultations than the usual care inpatient group ($P = .002$) (Table 2). GEMU inpatients received significantly more endocrine (9.1%, $P = .04$), psychology (21.8%, $P = .05$) and psychiatry (12.7%, $P = .004$) consultations than those in usual care. The mean number of inpatient services used was significantly higher in the GEMU group ($P = .02$) (Table 3). GEMU participants used several inpatient services more frequently: occupational therapy, 27.3% ($P = .004$); physical therapy, 18.2% ($P = .04$); and speech therapy, 13.2% ($P = .04$). Significantly more of the GEMU participants had at least one social work visit (35/45, 77.2% vs 3/54, 5.5%, $P < .001$). Chaplaincy use was not significantly different (GEMU 10/45, 22.7% vs 15/55, 27.3%, $P = .61$).

DISCUSSION

The magnitude of pain and its implications in frail elderly adults with cancer are substantial. Numerous studies have highlighted the prevalence of pain in individuals with cancer.^{5–7,20} Other studies have demonstrated that proper measures of treating pain can alleviate a large amount of suffering.^{4,21,22} Quality of life is a fundamental aspect of healthy aging, as is freedom from pain.

As previously reported in this cohort, and further substantiated here, there was a positive effect of comprehensive geriatric inpatient care on bodily pain.¹⁴ The effects on bodily pain were notable and were sustained for 1 year. The reasons for this effect were unclear, but it was hypothesized that there may have been better interdisciplinary care, characterized by better use of analgesics; more physical and occupational therapy use; and better management of depression, anxiety, and functional decline in elderly adults with cancer.¹⁴

There was not a significant difference in use of pain medications, although there was a strong trend toward greater use of NSAIDs in the GEMU group. NSAIDs are part of the WHO ladder for treating cancer pain and are effective for bone pain in particular.^{8,23} Moreover, although there was no difference in opioid use between the two arms, there was a trend toward fewer participants using no pain medicine. Thus, it is possible that pain medication use may play a role, but this study was underpowered to determine this, and a larger study would be needed to address this possibility.

The mean total number of consultations used was significantly higher in the GEMU group. Although data were not available on the specific questions addressed in the consultations, this may reflect a more-attentive approach to this groups' pain-related needs. Several consultant groups saw more GEMU than usual care participants with cancer. Of particular interest was the greater use of psychology and psychiatry consultation for the GEMU participants. Data exist to support the fact that treating an individual's mental health problems can have a large effect not just on their pain status, but also on their overall outlook.²⁴ Likewise, the greater use of social work services could have had a similar effect. Geriatric psychiatrists and other mental health professionals can contribute meaningfully to the provision of optimal care during the final phases of life. Their conversations with individuals and families about end-of-life care include the evaluation and treatment of suffering, including pain, depression, suicidality, anxiety, delirium, and end-of-life planning.²⁴ A study of methylphenidate versus placebo for cancer-related fatigue has also demonstrated the positive effect of such conversations. Participants in both groups received a daily telephone call from a nurse, and improvement in fatigue was noted in both groups. The authors concluded that this telephone call was a powerful intervention, enhancing participants' overall symptom relief and comfort.²⁵

Occupational therapy, physical therapy, and speech pathology were all used more extensively in the GEMU arm. The mean total number of these services used also was significantly higher. Physical therapy is helpful for maintaining gait, strength, and overall physical performance. Physical therapists can address pain using range-of-motion and strengthening strategies and modalities such as massage and transcutaneous electrical nerve stimulation units. Occupational therapy likewise has been shown to have positive outcomes in studies of its effect on pain and quality of life.²⁶

The GEMU interdisciplinary approach might improve discharge planning, but data were not available on this point, although even if this were so, it would not explain the improvement in pain scores occurring during hospitalization. Discharge planning might have, through a more-coordinated discharge plan, contributed to the maintenance of the effect sustained for 1 year.

Data were not available on the specific source of pain, and the pain reported may or may not represent pain directly due to cancer. In older adults with multiple comorbidities, the exact source of pain is often unclear, and it is probably fair to think of this as pain in elderly adults with cancer rather than cancer pain in elderly adults. In older adults with cancer, such as those in this study, multimorbidity is common, and thus, while seeking specific sources of pain is appropriate, control of symptoms such as pain will likely require a holistic approach.^{27,28} There are multifactorial contributions to symptoms, and as such, the interdisciplinary approach of the GEMU makes it a powerful resource for individuals with uncontrolled severe pain. Geriatricians' approach and the approach of others on the GEMU in this study might be akin to that of palliative care specialists. Palliative care interventions have been shown to be effective in managing pain,²⁹ although it is unknown whether the results reported herein would be achievable using a palliative care program specifically for an older population. There were no formal palliative care pain teams in operation at these VA Medical Centers at the time.

Limitations of this study include that it is a secondary analysis of participants from an investigation of a subset of frail elderly adults with cancer in a comprehensive geriatric assessment study. Data were not available to assess stage of cancer, its active treatment, length of time with disease, and response to therapy, all factors that may affect quality of life and, more specifically, pain. Information was not available on medication dosage, so change in dosing of analgesic medications could not be assessed. The medication database included as-needed and standing orders, but the as-needed orders represented <3% of the medications. The timeliness with which participants' needs were addressed cannot be shown based on the data available, but this too might have affected their care. Furthermore, this study was conducted solely within the VA system, so most of the participants were men. The inability to blind the clinicians providing care and the participants to the assigned treatments limited the original study from which the subset analysis comes, but the interviewer who assessed outcomes was unaware of the treatment assignments. The use of the SF-36 for assessing pain in this group of frail elderly adults with cancer has not been validated, to the knowledge of the authors, but data support the use of the SF-36 survey in diverse populations.³⁰

In conclusion, this analysis suggests that better pain control for individuals with cancer using GEMUs may be related to an interdisciplinary approach and engaging inpatient consultations and other services that could help alleviate suffering to a greater extent than medications. The benefit of GEMU interdisciplinary care may lie in its attention to emotional, social, and spiritual concerns and in addressing goals of care, all of which palliative care programs have now also adopted. Despite there being significantly more consultants and services used, there was no overall difference in hospitalization or cost of

care between study groups over the year of the index study.¹⁴ This study suggests that the GEMU and other approaches to geriatric evaluation and management may be tools in the armamentarium of clinicians managing symptoms in older adults with cancer. Future studies are needed, with prospective randomized controlled trials, to substantiate these findings and seek other approaches to improving cancer pain management in older people.

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Table 1

Pain Medication Use

Pain Medication	Usual Care (n = 55)%		GEMU (n = 45)%		Change (Discharge-Baseline)		P-value
	Baseline	Discharge	Baseline	Discharge	Usual Care	GEMU	
Nonsteroidal anti-inflammatory drugs (non-aspirin and cyclooxygenase 2 inhibitors), %	5.6	5.6	4.5	13.6	0	9.09	.16
Benzodiazepines, %	14.8	5.6	9.1	11.4	-9.2	2.3	.11
Atypical antipsychotics, %	0	0	0	0	0	0	N/A
Typical antipsychotics, %	1.8	0	2.3	0	-1.8	-2.3	.99
Sedatives and hypnotics, %	5.6	1.8	4.5	2.3	-3.7	-2.3	.95
Tricyclic antidepressants, %	7.4	9.3	6.8	4.5	1.8	-2.3	.32
Narcotic analgesics, %	33.3	33.3	43.2	43.2	0	0	>.99
Corticosteroids, %	3.7	7.4	6.8	9.1	3.7	2.3	.97
Amphetamine, %	0	0	0	2.3	0	2.3	.99
Aspirin, %	33.3	35.2	18.2	29.5	1.9	11.4	.49
Acetaminophen, %	18.5	31.5	31.8	54.5	13.0	22.7	.91
Selective serotonin reuptake inhibitors, %	5.6	11.1	4.5	4.5	5.5	0	.48
Number of pain medication groups, mean $\pm$ SD	1.22 $\pm$ 0.98	1.29 $\pm$ 1.02	1.25 $\pm$ 1.01	1.68 $\pm$ 1.16	0.07 $\pm$ 1.06	0.43 $\pm$ 1.19	.14

GEMU-geriatric evaluation and management unit.

Table 2**Inpatient Consultations**

Consultation	Usual Care (n = 55)	GEMU (n = 45)	Difference (GEMU–Usual Care)	P-value
Cardiology, %	7.3	9.1	1.8	.76
Endocrinology, %	0	9.1	9.1	.04
Gastroenterology, %	5.4	13.6	8.2	.17
Geriatrics, %	1.8	9.1	7.3	.17
Hematology–oncology, %	25.4	22.7	–2.7	.71
Infectious disease, %	9.2	11.4	2.3	.73
Nephrology, %	1.8	2.3	0.4	.99
Neurology, %	14.5	13.6	–0.9	.86
Podiatry, %	7.3	9.1	1.8	.76
Pulmonology, %	3.6	6.8	3.2	.65
Rheumatology, %	1.8	2.3	0.4	.99
General surgery, %	16.4	27.3	10.9	.2
Cardiothoracic surgery, %	1.8	4.5	2.7	.58
Neurosurgery, %	1.8	2.3	0.4	.99
Oral-maxillofacial, %	1.8	2.3	0.4	.99
Plastic surgery, %	0	0	0	—
Orthopedics, %	7.3	9.1	1.8	.76
Urology, %	9.1	15.9	6.8	.19
Vascular surgery, %	7.3	0	–7.3	.13
Otolaryngology, %	0	4.55	4.5	.20
Psychology, %	5.4	27.3	21.8	.05
Psychiatry, %	5.4	18.2	12.7	.004
Use of consultants, %				
None	58.2	18.2	–40.0	
Any 1	18.2	47.7	29.5	
Any 2	20	22.7	2.7	
Any 3	3.6	2.3	–1.4	
Any 4	0	4.5	4.5	
Any 5	0	2.3	2.3	
Any 6	0	2.3	2.3	
Total number of consultations, mean ± SD	0.68 ± 0.93	1.43 ± 1.30		.002

GEMU-geriatric evaluation and management unit.

Table 3**Inpatient Services**

Service	Usual Care (n = 55)	GEMU (n =45)	Difference (GEMU–Usual Care)	P-value
Audiology, %	5.4	9.1	3.6	.49
Chaplaincy, %	27.3	22.7	–4.5	.57
Occupational therapy, %	27.3	54.5	27.3	.004
Physical therapy, %	63.6	81.8	18.2	.04
Podiatry, %	9.09	13.6	4.5	.50
Speech pathology, %	7.27	20.4	13.2	.06
Use of services, %				
0	25.4	9.1	–16.4	
Any 1	34.5	31.8	–2.7	
Any 2	21.8	27.3	5.4	
Any 3	12.7	18.2	5.4	
Any 4	3.6	6.8	3.2	
Any 5	1.8	6.8	5.0	
Total number of services, mean $\pm$ SD	1.38 $\pm$ 1.21	2.02 $\pm$ 1.34		.02

GEMU-geriatric evaluation and management unit.