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Feature Articles

Prevalence and characteristics associated with high dose opioid users among older adults

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ABSTRACT

Our primary objective was to determine the prevalence and characteristics of high dose opioid users among older adults. Study populations included adults ≥65 years with: 1) 12-month continuous medical plan enrollment; and 2) at least 2 opioid prescriptions with a cumulative day supply ≥15 days. Opioid users were categorized as high dose >120 milligram morphine equivalents (MME) per day or lower dose ≤120 MMEs per day. Among eligible insureds, 3% (N = 7616) were identified as high dose opioid users. Compared to lower dose users, high dose opioid users were male, younger, depressed, in poorer health, had back pain, used benzodiazepines and/or sleep medications, and used 4 or more pharmacies. The prevalence of high dose opioid users was relatively small but users were characterized by a complex mix of physical and mental health issues. Interventions to reduce reliance on opioids may need mental health management to promote more effective pain management.

Introduction

Opioids are increasingly being used among older adults to manage both short term and chronic pain.[1,2] While opioid dosages vary widely, of particular concern are those individuals prescribed high daily doses of opioids, with increased risk for adverse events. These events could include opioid-related emergency room visits or hospitalizations, psychomotor impairment, falls, respiratory depression, sedation, substance abuse and/or overdose deaths.[3–12] Most research studies, however, include individuals 18 years and older[3,9–19] with few studies focused exclusively on older adults.[4–8,20,21] As large numbers of Baby Boomers age into the older age (i.e., 75 year and older) categories, drug utilization patterns are expected to change with prescribing trends promoting increased reliance on medications to manage medical conditions and increased likelihood of substance abuse issues.[1,2,13,14,21,22] To prepare for these changing trends, better understanding of older adult opioid use patterns, and specifically characteristics associated with high dose opioid utilization are necessary.

High dose opioid users in general populations are characterized as complex patients often with triple comorbidities of chronic pain, mental health issues, and substance use disorders.[3,12,14–17] The substance abuse issues, however, highlighted among younger adults with risks of overdose events requiring healthcare services and/or resulting in subsequent death are not as prevalent among older adults.[2,13,21,22] The origin of chronic pain among older adults is more diverse than among younger adults, often associated with medical conditions such as arthritis, chronic back pain, chronic obstructive pulmonary disease (COPD) or cardiovascular problems.[12,13,15,20] Pain and depression/anxiety appear to share a bidirectional relationship in all age groups: chronic pain may trigger mental health issues or depression/anxiety may manifest in physical symptoms of chronic pain.[12,18] Patients with comorbid pain and mental health issues may or may not experience greater pain severity, but certainly have fewer resources with which to tolerate all levels of pain.[3,15] Use of opioids as a first-line treatment to manage pain has shown efficacy for short-term pain, but evidence for effectiveness for chronic pain is less compelling.[17,19,23]

Conflicts of interest: This work was funded by the AARP Medicare Supplement Insurance Program. Shirley Musich, Shaohung S. Wang, Sandy Kraemer, and Luke Slindee are all employed by UnitedHealth Group and have stock with UnitedHealth Group. Charlotte S. Yeh is employed by AARP Services, Inc. However, their compensation was not dependent upon the results obtained in this research, and the investigators retained full independence in the conduct of this research. This research did not receive any specific grant or grant number from funding agencies.

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The complexity of managing chronic pain regardless of age is demonstrated in that, despite guidelines contraindicating use of opioids with sedative hypnotics (primarily benzodiazepines),[3,15,24] these drug classes, along with sleep medications, are often prescribed concurrently.[3,5,9,12,14–17,25] This may imply that even high dose opioids have not addressed the pain issues of these patients.[3,14,16] Those patients with mental health issues, particularly those already taking antidepressants and/or benzodiazepines, prior to their pain episode appear to be more likely to transition to chronic opioid use at higher doses, and for longer periods of time.[12,16,25] Thus, screening for psychiatric disorders prior to initiating opioids and closer follow-up may be vital to minimize progression to chronic high dose opioid use.[18]

To raise awareness for the risks associated with high dose opioids, in 2018, HEDIS (Healthcare Effectiveness Data and Information Set) added quality measures regarding opioid use, identifying high dose opioid criteria that put patients at high risk for adverse events associated with opioid use.[26] In the US, HEDIS is one of the most widely used sets of healthcare performance measures for monitoring quality of healthcare delivery across health plan carriers. While no definitive definition of "high dose" is generally utilized in the scientific literature, HEDIS set a daily dosage of >120 morphine milligram equivalents (MMEs) with the additional criteria of at least 2 opioid prescriptions for a total duration of at least 15 days as the criteria to raise concern, and highlighted those patients 18 years and older for additional follow-up.[26] They also added utilization of 4 or more prescribers and/or 4 or more pharmacies as sources for opioid prescriptions as red flags warranting attention.

No published research studies to date were found that considered the prevalence or characteristics of high dose opioid users among older adults with Medicare Supplement plans (i.e., Medigap).[27] In the US, government-funded Medicare covers adults age 65 and older, as well as those under 65 and disabled. Medicare fee-for-service plans (about 70% of all Medicare plans) pay about 80% of medical expenditures for these individuals but offer minimal prescription drug benefits. Those enrolled in these Medicare plans are personally responsible for obtaining additional insurance plans to cover the remaining 20% of medical expenses (i.e., Medicare Supplement or Medigap plans) and more inclusive prescription drug coverage (Medicare Part D plans). While most (about 90%) of those with original fee-for-service Medicare coverage have some type of supplemental insurance coverage, about 28% (currently about 10.2 million adults) have purchased Medigap coverage.[27] Since this population may differ in demographic, socioeconomic or health status characteristics from general older adult and/or specifically overall Medicare populations, it was of interest to determine the prevalence of high dose opioid users and to investigate characteristics associated with such use. This study adds to the literature in considering a 65 year and older Medicare Supplement study population in investigating both prevalence and characteristics associated with high dose opioid utilization based on the new HEDIS criteria.

Thus, our primary objective was to estimate the prevalence of high dose opioid use among insureds covered under AARP® Medicare Supplement plans. The secondary objective was to consider characteristics associated with high dose opioid use compared to those using opioids at lower dosages. This research was covered under the New England IRB #120160532.

It was hypothesized that older adult high dose opioid users would be more likely to be younger, male, in poorer health, suffer from back pain, be depressed, be more likely to use benzodiazepines and/or sleep medications and to have obtained their opioids from multiple providers and/or multiple pharmacies. We expected evidence of adverse effects associated with high dose opioids to be documented in an increased likelihood of injurious falls/hip fractures.

Methods

Study sample

In 2016, approximately 5 million Medicare insureds were covered by an AARP Medicare Supplement plan insured by UnitedHealthcare Insurance Company. These plans are offered in all 50 states, Washington DC, and various US territories. A sample of 2016 AARP Medicare Supplement insureds with AARP® MedicareRx plans insured through UnitedHealthcare (about 55% of insureds) who were at least 65 years of age was utilized to identify high and lower dose opioid users. Inclusion criteria for the study sample included: 1) 12-month continuous medical and drug plan enrollment during 2016; 2) at least 2 opioid prescriptions with a cumulative day supply ≥15 days during 2016; and 3) exclusion of all cancer and sickle cell patients. The study design was based on administrative medical claim and pharmaceutical drug databases maintained by UnitedHealthcare. No self-reported survey data was available. The final study sample that met inclusion criteria included 250,283 insureds; of these 7616 were high dose users and 224,667 were lower dose users.

High and lower dose opioid users

Opioid dosing was determined by converting to morphine milligram equivalents (MMEs) using the following formula: drug quantity*MME per dosing unit conversion factor, summed over all the opioid prescriptions filled during the one-year period of 2016.[28] Based on the HEDIS criteria (available from UnitedHealthcare), 120 MME/day was selected as the cut-point to define 1) high dose opioids (>120 MME/day) and 2) lower dose opioids (≤120 MME/day).

Covariates

Covariates were included to characterize high and lower dose opioid users and to adjust for other risk factors. These covariates included measures of demographics, socioeconomic factors, health status, and other characteristics taken from health plan eligibility and administrative medical claims.

Demographic questions included age and gender. Age groups were defined as: 64–69; 70–74; 75–79; 80–84; and ≥85 years. Low (less than 15% non-white), medium (15% to 59% non-white), and high (≥60% non-white) minority areas; and low (<$40,179), medium ($40,179 to <$ 57,199), and high (≥$57,199) median household income levels were geocoded from zip codes. AARP Medicare Supplement plan types were grouped by cost-sharing levels, including high-level coverage plans with minimal copayments or deductibles, and all other plans. Level of medical services utilization from medical claims was calculated as the Hierarchical Condition Category (HCC) score.[29] This score is used by Centers for Medicare & Medicaid Services (CMS) to risk adjust medical payments across various medical plans according to the health status of the different insured populations. HCC subgroups were defined as follows and utilized to control for health status: HCC scores <0.5; HCC scores 0.5 to <1.2; HCC scores 1.2 to <2.8; and HCC scores ≥2.8.

Prevalence of common chronic conditions

Ten chronic conditions identified using Evidence-Based Medicine (Symmetry EBM Connect® Version 8.3) software (asthma, chronic obstructive pulmonary disease (COPD), depression, diabetes, heart problems, hyperlipidemia, hypertension, obesity/overweight, osteoporosis and rheumatoid arthritis) were included in these analyses. This software program was developed to calculate utilization of care patterns from healthcare claims and medications from

pharmaceutical claims using a defined set of rules for evidence-based care associated with various chronic conditions.

Injurious falls/hip fractures and back pain

Injurious falls requiring medical services or hip fractures, as a combined measure, were defined from suggested HEDIS diagnoses codes (available from UnitedHealthcare).[26] Falls or hip fractures were documented from these selected diagnoses codes at any time during the 12-month study period.

Musculoskeletal back pain was defined from back pain diagnoses codes after excluding all back pain associated with cancer, trauma, and drug abuse as defined by the HEDIS code specifications.[26] Back pain diagnoses were documented at any time during the 12-month study period.

Benzodiazepine and prescription sleep medication use

Benzodiazepines were defined from National Drug Codes (NDCs) included in the drug class for general use benzodiazepines. Prescription sleep medication users were defined from NDCs for insomnia recommended by the Centers for Disease Prevention and Control (CDC).[30]

Opioid use patterns

The prevalence of opioid use by drug name categorized as long acting or short acting was utilized to determine prevalence of use by category. The average number of different opioids used during 2016 was calculated for high and lower dose users. Opioid dependence drug therapy was determined from NDCs. The number of different prescribers ordering opioids was determined and categorized as: 1, 2, 3, or ≥4. The number of different pharmacies dispensing opioids was determined and categorized as: 1, 2, 3, or ≥4.

Statistical models

Characteristics associated with high dose opioid users compared to lower dose users were determined using multivariate logistic regression models. Covariates included all of those variables listed in Table 1. Variables with high correlations (e.g., >0.5) were dropped from regression models. All analyses were completed using SAS Enterprise Guide Version 7.1 (SAS Institute Inc., Cary, NC, USA).

Sensitivity analyses

As a sensitivity analysis, the analyses described above were repeated with lower dose opioid users propensity matched[31,32] on the demographic, socioeconomic, and health status variables listed in Table 1 to the defined high dose users. Since the results were similar, we opted to show only the results using the full study population.

Results

Overall, among the study sample (N = 321,566), about 4% (N = 11,805) met the HEDIS criteria for high dose opioid use with 96% lower dose users (N = 309,761). Subsequently, 18% of the study sample (N = 54,521) were excluded due to cancer or sickle cell diagnoses according to the HEDIS rules; 5% (N = 16,762) were excluded for age <65 years or missing gender. After these exclusions, the final study populations included 7616 (3%) high dose opioid users and 242,667 (97%) lower dose opioid users (Table 1).

As a group, opioid users were mostly female (69%), 70–75 years of age (27%), white (48%) and high income (43%). High dose users often suffered from back pain (77%) and had concurrent opioid use with benzodiazepines (49%) or prescription sleep medications (32%). While generally the profile of chronic medical conditions for high dose users and lower dose users were similar, high dose users were more likely to have COPD.

On average, high dose opioid users were prescribed 2.3 different opioids during 2016 compared to 1.6 opioids for lower dose users. The most commonly used opioids for high dose users included: short acting oxycodone (42%); long acting fentanyl (38%); short acting oxycodone/acetaminophen (26%) and long acting oxycodone (24%). High dose opioid users were more likely to use long acting opioids compared to lower dose users (81% vs. 10%). High dose users more often obtained their opioids from multiple prescribers and pharmacies compared to lower dose users.

Characteristics associated with high dose opioid users

High dose opioid users were more likely to be younger, male, in poorer health (i.e., higher HCC scores), suffering from back pain, depressed, using benzodiazepines and/or sleep medications and to have obtained their opioids from multiple pharmacies. (Table 2) Multiple opioid prescribers were not highly predictive of high dose opioid use. Likewise, injurious falls/hip fractures were not positive predictors associated with opioid use (odds ratios <1.0).

Discussion

In this population of AARP Medicare Supplement insureds, 3% were identified as high dose opioid users. Although definitions of "high dose" opioids vary (e.g., ≥100 MME; ≥180 MME; or ≥200 MME)[3,11,12,15,17] and studies measuring high dose prevalence have focused on populations 18 years and older, the prevalence of high dose users in this study was in general agreement with previous publications (i.e., 2.9% to 4.0%).[12,15,17] The opioids used most frequently by high dose users were long acting opioids, commonly fentanyl and/or oxycodone.[11,15] As anticipated from research on younger adult populations, older adult high dose users frequently used 2 or more different opioids,[14–16] and were concurrently prescribed benzodiazepines and/or prescription sleep medications.[3,5,9,12,14–18,25] In contrast with younger adults, there was minimal evidence of opioid dependence, as determined from diagnosis codes (<1%).[2,13,21,22] This may reflect the reality of a low incidence of opioid dependence or that physicians are less likely to screen for opioid dependency in older adults.

Characteristics associated with high dose opioid users compared to lower dose users, as hypothesized, included being male, younger, depressed, in poorer health, suffering from back pain and using benzodiazepines and/or prescription sleep medications.[12–15,20] However, contrary to expectations, while obtaining opioids from multiple pharmacies was highly predictive and noteworthy, utilizing multiple opioid prescribers was not predictive of high opioid use,.[9,12] Generally, these characteristics are similar to those demonstrated for younger adult populations. Older adult high dose opioid use, however, is often complicated with polypharmacy, medications necessary in managing multiple chronic medical conditions, and age-related pharmacokinetic changes affecting absorption and/or clearance of the various medications.[1] Whereas younger adults are at risk for increased mortality rates due to overdose or accidents, older adults utilizing opioids do not demonstrate this trend; instead mortality continues to be associated with the same chronic medical conditions as those not using opioids, although at somewhat accelerated rates (e.g., heart problems and COPD).[4,6,7,20]

As in other studies, chronic opioid users often suffered from back pain.[12,14,17–19,22] In our study, over seventy-five percent of older high dose opioid users suffered from back pain; almost 60% of lower dose users also had back pain diagnoses. While opioids are commonly

Table 1
Unadjusted demographic characteristics associated with high and lower dose opioid users.

	Overall Sample % or Mean	High Dose Opioids % or Mean	Lower Dose Opioids % or Mean	p-value
Number	250,283	7,616	242,667	
Gender				
Male	31.5	37.5	31.3	<0.0001
Female	68.5	62.5	68.7	
Age				
65–69	20.3	32.1	19.9	<0.0001
70–74	27.2	32.8	27.1	
75–79	20.8	17.0	20.9	
80–85	13.6	8.7	13.7	
≥85	18.1	9.5	18.4	
Minority (from zip code)				
Low	47.7	46.4	47.7	0.02
Medium	46.4	48.0	46.3	
High	3.3	3.0	3.3	
Median income (from zip code)				
Low	17.8	16.1	17.9	<0.0001
Medium	37.6	37.0	37.6	
High	43.2	45.5	43.1	
Plan type				
High coverage	78.6	80.5	78.5	<0.0001
Other	21.4	19.5	21.5	
HCC Score				
<0.50	19.1	15.6	19.2	<0.0001
0.50 to <1.20	39.9	34.8	40.0	
1.20 to <2.80	32.5	36.4	32.4	
≥2.8	8.6	13.3	8.5	
EBM Conditions				
Asthma	10.0	10.9	10.0	0.01
COPD	16.3	23.0	16.1	<0.0001
Depression	11.2	17.4	11.0	<0.0001
Diabetes	28.4	26.9	28.5	0.002
Heart problems	36.7	34.0	36.8	<0.0001
Hyperlipidemia	64.1	53.6	64.4	<0.0001
Hypertension	85.9	81.5	86.0	<0.0001
Obesity/overweight	21.2	20.3	21.3	0.05
Osteoporosis	10.1	12.0	10.1	<0.0001
Rheumatoid arthritis	5.5	8.4	5.4	<0.0001
Injurious fall/hip fracture	12.1	10.9	12.1	0.001
Back pain	59.1	77.1	58.4	<0.0001
Benzodiazepine use	34.9	49.2	34.5	<0.0001
Prescription sleep medication use	22.7	31.7	22.4	<0.0001
Opioid dependence drug therapy	0.1	0.4	0.1	<0.0001
Average number of opioids used	1.6	2.3	1.6	<0.0001
Long-acting opioids	11.7	81.2	9.6	<0.0001
Opioid name (≥3%)				
Oxycodone – Short acting	11.8	42.0	10.9	<0.0001
Fentanyl – Long acting	3.9	37.6	2.8	<0.0001
Hydrocodone/acetaminophen – Short acting	50.8	27.0	51.5	<0.0001
Oxycodone/acetaminophen – Short acting	23.5	26.1	23.4	<0.0001
Oxycodone – Long acting	3.3	24.3	2.7	<0.0001
Morphine – Long acting	3.1	21.4	2.5	<0.0001
Hydromorphone – Short acting	3.0	11.0	2.7	<0.0001
Tramadol – Short acting	44.1	7.7	45.3	<0.0001
Codeine/acetaminophen – Short acting	9.4	2.3	9.6	<0.0001
Opioid prescribers				
1	38.2	37.5	38.2	<0.0001
2	35.0	28.8	35.2	
3	16.2	17.3	16.1	
≥4	10.6	16.5	10.4	
Opioid pharmacy providers				
1	68.2	55.2	68.7	<0.0001
2	24.4	27.6	24.3	
3	5.6	10.9	5.5	
≥4	1.7	6.4	1.6	

Notes: HCC = Hierarchical Condition Category; COPD = chronic obstructive pulmonary disease; EBM = Evidence-Based Medicine; Missing categories were deleted for brevity.

prescribed for chronic back pain, a recent meta-analysis concluded that long term efficacy (≥16 weeks) of such treatments is unclear.[23] There is some evidence that early treatment of back pain with physical therapy might reduce the dependence of these patients on opioids[33]; in addition, a recent study indicated that non-opioid medications may be as effective as opioids in managing this type of chronic pain.[19] Thus intervention programs to minimize back pain among older adults or offer non-pharmaceutical solutions for chronic back pain may be beneficial for reducing opioid use.

Table 2
Characteristics associated with high dose opioid users.

Variable	Model 1 (+Prescribers)		Model 2 (+Pharmacies)	
	Odds Ratio	p-value	Odds Ratio	p-value
Age 65–69	3.42	<0.0001	3.20	<0.0001
Age 70–74	1.57	<0.0001	1.54	<0.0001
Age 70–79	1.54	<0.0001	1.49	<0.0001
Age 80–84	1.15	0.009	1.14	0.02
Male	1.26	<0.0001	1.26	<0.0001
Low income	0.85	<0.0001	0.85	<0.0001
Middle income	0.93	0.004	0.93	0.004
Low minority	1.05	0.36	1.07	0.21
Middle minority	1.11	0.04	1.13	0.02
High coverage plans	0.99	0.60	0.98	0.54
HCC Score 0.50 to <1.20	1.36	<0.0001	1.35	<0.0001
HCC Score 1.20 to <2.80	1.84	<0.0001	1.83	<0.0001
HCC Score ≥2.8	2.49	<0.0001	2.46	<0.0001
COPD	1.20	<0.0001	1.20	<0.0001
Depression	1.26	<0.0001	1.24	<0.0001
Injurious falls/hip fractures	0.85	<0.0001	0.81	<0.0001
Back pain	2.21	<0.0001	2.14	<0.0001
Benzodiazepine use	1.50	<0.0001	1.47	<0.0001
Sleep medication use	1.26	<0.0001	1.23	<0.0001
Opioid prescriber = 2	0.76	<0.0001		
Opioid prescriber = 3	0.89	0.0009		
Opioid prescriber = ≥ 4	1.10	0.008		
Opioid pharmacy = 2			1.30	<0.0001
Opioid pharmacy = 3			2.03	<0.0001
Opioid pharmacy = ≥ 4			3.61	<0.0001

Notes: HCC = Hierarchical Condition Category; COPD = chronic obstructive pulmonary disease; Reference categories include: Age ≥85; female; high income; high minority; other plan types; HCC Score < 0.5; no COPD; no depression; no injurious fall/hip fracture; no back pain/back surgery; no benzodiazepine use; no sleep medication use; opioid prescriber = 1; opioid pharmacy provider = 1.

Opioid side effects of respiratory depression and cough suppression puts older adults at risk for complications and increased mortality associated with respiratory conditions, especially COPD.[4–7] A Canadian study utilizing a large study population with COPD demonstrated that as many as 70% of those with COPD were prescribed opioids for chronic pain, often with concurrent use of benzodiazepines to manage anxiety associated with breathlessness.[6] In our study, COPD was not strongly associated with high dose opioid use (Odds Ratio 1.20).

About 50% of high dose opioid users in this study sample were also prescribed benzodiazepines, with 30% receiving prescription sleep medications despite CDC guidelines to avoid these medication combinations.[24] Such prescribing patterns reflect the complexity of these patients and attempts by physicians to manage the needs of their patients. Use of concurrent benzodiazepines, however, is consistent with evidence of diagnosed mental health issues and similar prescription drug patterns utilized for younger adults. In these studies including all age groups, 32% to 60% received prescriptions for sedative hypnotic drugs augmenting opioids in the management of chronic pain.[3,5,9,12,14–18] Contrary to expectations, we found no evidence of increased falls among high dose users even with concurrent use of opioids and benzodiazepines.[34,35] This may be related to the higher prevalence of 65–74 year olds (65%) in our high dose population or that high dose users over long periods of time (e.g., one year in this study) had become acclimated to the drugs and were less likely to suffer this specific adverse effect. While we could not document increased adverse events including falls, emergency room visits, inpatient admissions and increased mortality rates (data not shown), other adverse effects, such as drug-drug interactions from polypharmacy, may have occurred. Nevertheless, if managed carefully and assuming high doses above 120 mg are avoided, opioids may provide a viable option for older adults' pain management.

While there was minimal evidence of substance abuse issues within this current older adult population, drug use trends indicate that as the Baby Boomers age, problems with substance abuse, overdose complications and/or deaths will become more prevalent.[1,2,14,21] Health services organizations are being warned to prepare for these changing trends. Physicians may need to become more aware of substance misuse (e.g., taking larger doses, shortening time between doses; requesting prescription refills earlier)[2] in their patients receiving opioids. Furthermore, interventions may need to be tailored for older adults whose substance use disorders may differ from those of younger adults.[2]

Interventions to reduce dependency on opioids may need to be multidimensional integrating mental health management (e.g., depression or anxiety) into pain management programs.[36] Weaning current high dose users to lower doses of opioids can be successful but requires cooperation between physicians and patients, multiple resources and a long term strategy for dose adjustment.[37] Despite evidence of success, most opioid interventions are small scale, research-oriented, focus on those <65 years and lack generalizability to older adult populations.[36–38] Little attention has been given to the importance of sleep management in the complexity of chronic pain and mental health issues; thus this dimension of pain management is largely unexplored.[39]

This study has some limitations. The study population of AARP Medicare Supplement insureds may not generalize to all older adults or other Medicare or Medicare Supplement beneficiaries. Opioids, benzodiazepines and sleep medications were identified from NDCs in pharmacy claims. Pharmacy databases confirm prescription purchases but we had no indication of whether patients actually consumed the drugs as directed. We had no record of prescription drug purchases outside of the specific Medicare Part D drug plan, although we expect that those types of purchases would be relatively minor. Cancer and sickle cell patients were excluded, however, we could not identify hospice and end-of-life opioid use; thus those patients were included in the study population. We had no measurements of pain severity or pain interference and minimal information (i.e., diagnosis codes) on the causes or sites of the pain being managed, which may have enhanced our results. Mental issues were identified from diagnosis codes and/or medication use, thus depression and anxiety were likely under reported. Income and minority status were geocoded from US Census zip code areas, thus may not necessarily reflect the actual income or minority status of an individual member. Strengths of the study include a large study population that identified high dose opioid users, as well as selected characteristics associated with these older adults.

Conclusion

Overall, in this population of Medicare Supplement insureds, 3% were identified as high dose opioid users. These patients were characterized by a complex mix of physical and mental health issues but no evident opioid substance abuse issues. Despite guidelines to the contrary, patients were often receiving concurrent benzodiazepines, antidepressants and/or sleep medications putting them at increased risk for adverse events. With predictions of changing drug use and abuse trends as Baby Boomers age, health professionals may need to increase their awareness of substance abuse issues and consider interventions that integrate mental health and sleep management to promote the effectiveness of their pain management strategies.

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