

Treatment Retention in Older Versus Younger Adults with Opioid Use Disorder: A Retrospective Cohort Analysis from a Large Single Center Treatment Program

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ABSTRACT

OBJECTIVE: To compare treatment retention in a Medication for Opioid Use Disorder program between older and younger adults with opioid use disorder.

METHODS: This retrospective cohort study was conducted from 2015 to 2018 at an urban academic hospital's opioid and drug treatment center. Participants were adults, 18 and older, diagnosed with Opioid Type Dependence. Older adults were defined as age 50 and older. Poisson and logistic regression analyses examined whether older age was associated with treatment retention.

RESULTS: Overall, 288 individual charts were reviewed; 123 were aged 18-49, and 78 were aged 50 and older. Older adults were more likely to stay in treatment for six months or longer (OR=1.73, [1.02, 2.96], P-value = 0.04) and have a higher number of treatment visits overall (RR=1.06, [0.98, 1.16] [P-value=0.16]).

CONCLUSIONS: Older adults are more likely than younger adults to be retained in long-term treatment in a Medication for Opioid Use Disorder program.

KEYWORDS: opioid use disorder, buprenorphine, older adults, comorbidity, chronic pain

size of the baby boomer cohort, i.e. those born between 1946–1964, and their higher prevalence of substance use.² In addition to having a substance use disorder, older adults with OUD are more likely than their younger counterparts to be diagnosed with medical and psychiatric comorbidities.^{3,4} Over 60% of older adults with OUD are expected to be diagnosed with chronic pain, presenting a paradoxical challenge for patients seeking recovery.⁵ This is further complicated by a patient's increased age and rise in comorbidities, due to the pathologic changes associated with aging and long-term medication use – especially within the context of opioids.

Over the last 15 years, there has been a considerable rise in primary heroin-use related hospital admissions for older adults, as well as admissions seeking treatment for OUD.⁶ However, a recent systematic review concluded that little is known about treatment outcomes in older adults.⁷ Additional work is needed to investigate differences in treatment retention for older and younger adults to determine how best to retain these patients in life-saving treatment programs, as untreated substance use disorders may worsen medical and psychiatric comorbidities.³

This study examines the relationship between older age and MOUD treatment retention in adults with OUD, attending a large treatment program affiliated with an academic medical center. We also sought to compare characteristics of younger versus older adults in treatment.

INTRODUCTION

Medication for Opioid Use Disorder (MOUD), which includes Methadone, Buprenorphine-Naloxone, and Injectable Naltrexone, is the standard of care for adults with Opioid Use Disorder (OUD) in the United States.¹ MOUD is associated with fewer emergency room visits, hospitalizations for opioid-related care, and overdoses; overall it reduces opioid-related morbidity and mortality, and improves the patient's quality of life.¹ Unfortunately, there is a gap between MOUD use and older adult populations. For older adults with OUD, less than 10% use medication-based treatment,² but mostly silent, epidemic among older adults. We sought to analyze the trends in admissions for substance abuse treatment among older adults (aged 55 and older).

Although MOUD remains underutilized by older adults with OUD, there is an increasing number of older adults seeking treatment. This is believed to be largely due to the

METHODS

This retrospective cohort study was conducted among participants attending an outpatient treatment center over a three-year period from May 1, 2015 to May 1, 2018. The treatment center was affiliated with an urban academic medical center that provides MOUD, specifically buprenorphine-naltrexone, behavioral therapy, and social services. De-identified data was extracted from electronic health records (EHR) and included patients over the age of 18 who were diagnosed with Opioid Type Dependence (ICD 9: 304.00; ICD 10: F11.20). Although there is no standard definition of an older adult, we defined this population as someone aged 50 years or older in accordance with prior studies.^{7,8} The study was approved by the hospital's institutional review board.

Descriptive and inferential statistics were performed using RStudio version 1.0.136 statistical software (RStudio, Inc.,

Boston, MA). Bi-variate assessment of sociodemographic variables, median visit length, duration of treatment, and average number and type of comorbid conditions were performed to assess the relation amongst older and younger adults. To compare characteristics, P-values were calculated using either Chi-Square or Kruskal-Wallis test by ranks depending on the form of data. Unadjusted and adjusted Poisson and logistic regressions were used to assess the relationship between older age and MOUD retention, defined as attending a greater number of treatment visits or being in treatment for six months or longer.

RESULTS

Overall, the study sample identified as male (49.0%), white (81.6%), and non-Hispanic/Latino (91.0%). Amongst older adults, the age ranged between 50–77 years, with an average age of 58.7. The median number of treatment visits was 6.5 and the median duration of treatment was 79.5 days. In those aged 50 or older, there was a higher median number of visits (7) and a longer treatment duration (113 days) compared to younger adults – 6 visits and 63 days, respectively. Older adults were significantly more likely to be

retained in treatment for six months or longer compared to younger adults (P-value=0.05). Older adults were diagnosed with more medical comorbidities (P-value<0.001), while younger adults were diagnosed with more behavioral health conditions (P-value=0.005). A greater, but non-significant, proportion of older adults were diagnosed with chronic pain (P-value=0.12). There were no significant differences between age groups for having a history of alcohol or cannabis use disorder, but younger adults were more likely to have a history of cocaine, amphetamine, or benzodiazepine use disorder (P-value<0.001).

Number of Treatment Visits

Although age was not statistically significantly, the unadjusted Poisson rate ratio for age was 1.06 [0.98, 1.16]; that is, among the study population, adults aged 50 years or over had 6% more MOUD treatment visits during the study period compared to those under the age of 50 (Table 1). When adjusting for gender, race, and comorbidities, the adjusted rate ratio was 1.03 [0.94, 1.13] (P-value = 0.49). In the adjusted Poisson model, female (RR=0.86 [0.80, 0.94]), Black or African American (RR=0.93 [0.89, 0.97]), non-Hispanic/Latino (RR=1.27 [1.19, 1.35]), chronic pain (RR=0.72

Table 1. Unadjusted and Adjusted Rate Ratios of MOUD Treatment Visits and Odds Ratios of Long-term Retention in MOUD Treatment

	Unadjusted RR [95% CI]	P-Value	Adjusted RR [95% CI]	P-Value	Unadjusted OR [95% CI]	P-Value	Adjusted OR [95% CI]	P-Value
Age ≥ 50 years old	1.06 [0.98, 1.16]	0.16	1.03 [0.94, 1.13]	0.49	1.73 [1.01, 2.96]	0.04*	1.51 [0.82, 2.79]	0.19
Female	0.86 [0.79, 0.93]	<0.001***	0.86 [0.80, 0.94]	<0.001***	0.90 [0.55, 1.47]	0.67	0.91 [0.52, 1.60]	0.75
Black or African American	0.96 [0.91, 1.0]	0.08	0.93 [0.89, 0.97]	0.002**	0.87 [0.63, 1.16]	0.35	0.75 [0.53, 1.04]	0.09
Not Hispanic or Latino	1.28 [1.2, 1.36]	<0.001***	1.27 [1.19, 1.35]	<0.001***	2.17 [1.41, 3.46]	< 0.001***	2.11 [1.3, 3.57]	0.003**
Comorbid Medical Diagnosis ^a	0.78 [0.67, 0.90]	0.001**	0.88 [0.86, 0.91]	0.85	0.24 [0.07, 0.66]	0.01*	0.53 [0.14, 1.64]	0.30
Chronic Pain	0.65 [0.57, 0.73]	<0.001***	0.72 [0.63, 0.82]	<0.001***	0.31 [0.13, 0.67]	0.005**	0.43 [0.17, 1.03]	0.07
Comorbid Behavioral Health Diagnosis ^b	0.75 [0.69, 0.82]	<0.001***	0.83 [0.75, 0.92]	<0.001***	0.24 [0.13, 0.43]	<0.001***	0.34 [0.17, 0.68]	0.003**
History of Comorbid Substance Use Disorder Diagnosis								
Alcohol Use Disorder	0.75 [0.65, 0.86]	<0.001***	0.84 [0.72, 0.98]	0.03*	0.25 [0.07, 0.68]	0.01*	0.53 [0.14, 1.64]	0.31
Cannabis Use Disorder	0.40 [0.22, 0.64]	<0.001***	1.38 [1.07, 1.79]	0.01*	0.0 [0.0, 0.0]	0.98	0.0 [0.0, 0.0]	0.99
Other Substance Use Disorders ^c	0.77 [0.69, 0.85]	<0.001***	0.67 [0.52, 0.85]	0.001**	0.22 [0.10, 0.45]	<0.001***	0.35 [0.15, 0.78]	0.01*

a. "Comorbid Medical Diagnoses" includes Hepatitis C Virus, Chronic Heart Failure, Chronic Kidney Disease, Chronic Pulmonary Disease, and Diabetes.

b. "Comorbid Behavioral Health Diagnoses" includes Depression, Anxiety, Bipolar Disorder, Post-Traumatic Stress Disorder, and Schizophrenia.

c. "Other Substance Use Disorders" includes Cocaine Use Disorder, Amphetamine Use Disorder, Benzodiazepine Use Disorder.

d. *P-value <0.05

e. **P-value <0.01

f. ***P-value <0.001

[0.63, 0.82]), behavioral health comorbidities (RR=0.83 [0.75, 0.92]), alcohol use disorder (RR=0.84 [0.72, 0.98]), cannabis use disorder (RR=1.38, [1.07, 1.79]), and other substance use disorders (RR=0.67 [0.52, 0.85]) were all significant predictors of the number of treatment visits.

Six-month Treatment Retention

Looking at long-term treatment retention, older adults are 1.73 ([1.01, 2.96], P-value=0.04) times more likely to stay in MOUD treatment six months or longer compared to younger adults per the unadjusted logistic regression model (Table 1). In the multivariate model, age is not statistically significant, but non-Hispanic/Latino (OR=2.11 [1.3,3.57]), behavioral health comorbidities (OR=0.34 [0.17, 0.68]), and other substance use disorders (OR=0.35 [0.15, 0.78]) are significantly associated with long-term treatment retention.

DISCUSSION

Since untreated substance use disorders can worsen prognosis of comorbidities, and older adults are more likely to have comorbid diagnoses, it is important to retain patients with OUD in MOUD treatment to prevent further morbidity and mortality. This study investigated the relationship between older age and MOUD treatment retention, using two definitions for treatment retention. Older age was significantly associated with retention in MOUD treatment for greater than six months, but not significantly associated with a higher number of treatment visits overall. Consistent predictors across both measurements of retention were ethnic group, behavioral health comorbid diagnoses, and history of cocaine, amphetamine or benzodiazepine use disorder. These findings align with current literature showing older patients have better OUD-related treatment outcomes than their younger counterparts.^{7,9}

One of the main concerns with treating older adults through MOUD programs is pre-existing comorbid diagnoses, as the number of comorbidities and subsequent rate of mortality typically increases with age.⁷ However, younger adults in this cohort shared a greater burden of comorbid conditions compared to older adults, and were more likely to be diagnosed with a behavioral health or substance use disorder. Younger patients with more medical, behavioral health, and substance use comorbidities were less likely to be retained in MOUD treatment, which may indicate that younger patients with more comorbidities are less adherent or need less treatment visits to complete a MOUD program. It may also indicate that younger patients with MOUD feel they are managed appropriately by their primary care physician or other specialist, or older adults with behavioral health and substance use conditions are underdiagnosed.

Another issue for MOUD programs is accommodating therapy regimens for patients with comorbid OUD and chronic pain, as many pain diagnoses have been historically

treated with opioid analgesics.⁵ Older adults in our cohort were more likely to be diagnosed with chronic pain compared to younger adults, but not significantly. This may be a result of underdiagnosing older adults with chronic pain or indicates that our treatment center sees a large number of younger adults with chronic pain conditions.

Older adults face several barriers to accessing substance use treatment, including stigma, limited number of treatment providers, comorbid medical conditions, and private treatment programs not accepting Medicare.¹⁰ Nationally, there are multi-disciplinary treatment programs for older adults that combine care for medical comorbidities with MOUD in order to address these barriers.¹¹ In Rhode Island, the University of Rhode Island's Geriatric Education Center provides an online educational seminar for recognizing and managing opioid use disorder in older adults, but to our knowledge there are no dedicated treatment programs for older adults.¹² Future work might explore the effectiveness of dedicated programs for older adults.

Several limitations should be noted within the context of this research. The sample population is solely representative of MOUD patients from a single urban healthcare facility, with the majority identifying as non-Hispanic, Caucasian males under the age of 50. As many older adults with multimorbidity may be managed by a variety of long-term care physicians, this research may be missing a key subset of the population. Additionally, all records were obtained via EHR of one treatment center. This limits the data by lacking study participant self-report, and missing information from other treatment centers used per person. Additionally, study participants received MOUD treatment solely with buprenorphine-naltrexone. Different treatment outcomes may be observed in patients receiving alternative therapies.

CONCLUSIONS

In this single center study, age was associated with long-term treatment retention, meaning older adults were likely to remain in lifesaving MOUD programs once they enroll. In order to reduce possible mortality from an untreated OUD, older adults should continue to be recruited at a comparable rate to the younger adult population. This study prompts the need to increase engagement of older adults, as it appears that they are as likely as younger adults to remain in long-term MOUD treatment.

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