Impact of medications for opioid use disorder on discharge against medical advice among people who inject drugs hospitalized for infective endocarditis

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Abstract

Background and Objectives: The impact of medications for opioid use disorder (MOUD) on AMA discharges among people who inject drugs (PWID) hospitalized for endocarditis is unknown.

Methods: A retrospective review of all PWID hospitalized for endocarditis at our institution between 2016 to 2018 (n=84).

Results: PWID engaged with MOUD at admission, compared to those who were not, were less likely to be discharged AMA but this did not reach statistical significance in adjusted analysis (OR 0.22, 95%CI 0.033 to 1.41, p=0.11). Among out-of-treatment individuals, newly initiating MOUD did not lead to significantly fewer AMA discharges (OR 0.98, OR 0.98, 95%CI 0.26 to 3.7, p=0.98).

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Conclusion and Scientific Significance: PWID hospitalized for endocarditis are at high risk for discharge AMA but more research is needed to understand the impact of MOUD.

Introduction:

In the context of the growing opioid crisis, increasing numbers of people who inject drugs (PWID) are hospitalized for infective endocarditis.[1] Studies have consistently found that hospitalized PWID are discharged against medical advice (AMA) frequently, with prevalence ranging from 4.8% to 49%.[2-4] AMA discharges are associated with higher mortality rates, more frequent readmissions, and greater likelihood of future AMA discharges.[5] Reasons for the AMA discharge may include the desire to use drugs, opioid withdrawal, poor pain control, poor communication with staff, or feeling stigmatized.[6,7] In a study of 488 people who used illicit drugs with at least one prior hospitalization, almost half (43.4%) reported experiencing at least one AMA discharge.[7]

Prior studies have identified a number of factors that reduce AMA discharges among PWID, including the use of methadone during and prior to the hospitalization and the implementation of an addiction consultation service.[4,7] Medications for opioid use disorder (MOUD) have been shown to reduce opioid cravings, suppress illicit opioid use, and reduce mortality. However, limited research specifically examines the impact of MOUD on discharge AMA among PWID with endocarditis. Thus, a retrospective chart review was performed to examine the impact of MOUD on the prevalence of discharge AMA among hospitalized PWID.

Methods:

Setting:

The study was conducted at Brigham and Women's Hospital, Boston MA. The Partners Human Research Committee approved the study.

Participants:

The Research Patient Data Registry (RPDR) was used to identify medical records for inclusion. The RPDR includes data from all Partners Healthcare-affiliated hospitals and allows for searches of specific text terms in the medical record. Text searches of discharge summaries were conducted using the following terms: "endocarditis" in conjunction with any of the following: "opioid", "heroin", "injection", and "IVDU". Inclusion was limited to individuals with a diagnosis of an opioid use disorder admitted to Brigham and Women's Hospital for infective endocarditis due to injection drug use between January 1, 2016 and December 31, 2018. We excluded individuals who were not admitted for infective endocarditis, as well as individuals without any recent history of injection drug use. We identified 156 records for possible inclusion. After manual review, 72 were excluded for not meeting the inclusion criteria. Reasons for exclusion (multiple reasons for exclusion could apply for each excluded individual) were as follows: 37 had no recent history of intravenous opioid use, 34 did not have infective endocarditis, 39 had no diagnosis of opioid use disorder, 22 were diagnosed with endocarditis due to reasons other than injection drug use, 5

due to in-hospital mortality, and 2 were hospitalized at a hospital other than Brigham and Women's Hospital. In total, 84 individual patients met inclusion criteria.

Data extraction:

Chart review was conducted by the authors (MM, DR, BM) and discrepancies resolved through conference. Extracted data included: sociodemographic data, psychiatric and substance use histories, receipt of addiction psychiatry consultation, engagement with MOUD treatment at the time of admission, initiation of MOUD during the hospitalization, the type of MOUD initiated, hospital length of stay, discharge AMA, and 30-day readmission. The individual was deemed to be engaging with MOUD at admission if the admitting medical team confirmed the MOUD use by calling the methadone clinic or checking the state prescription monitoring program.

Analytic strategy:

Descriptive statistics were used to summarize the extracted data. Demographic and clinical variables between those who were and were not engaged in MOUD at the time of admission were compared using chi-square or Fisher's exact test for categorical variables, and student t-test for continuous variables. In addition, demographic and clinical variables of out-of-treatment individuals who did and did not initiate MOUD during the hospitalization were also compared.

Post-hoc analysis:

We conducted univariate analyses to identify predictors of discharge AMA, which were then entered as independent variables in a binary logistic regression model with discharge AMA as the dependent variable.

Results:

Engagement with MOUD at the time of admission:

The demographic and clinical variables of those 84 individuals hospitalized for infective endocarditis are summarized in Table 1. Overall, 34 individuals (40.5%) were actively engaged in MOUD treatment at the time of hospital admission. The specific MOUD used were buprenorphine (44.1%), methadone (50.0%), and extended-release naltrexone (5.9%). Individuals engaged in MOUD at the time of admission were significantly less likely to be discharged AMA (5.9% vs 24.0%, OR 0.20, 95%CI 0.041 to 0.95, p=0.029).

MOUD initiation among out-of-treatment individuals:

Of the 50 individuals who were out-of-treatment, 21 (43.4%) successfully initiated MOUD during the hospitalization (Table 1). Buprenorphine was most common (76.2%) followed by methadone (23.8%). Prevalence of discharge AMA of out-of-treatment individuals between those who did and did not initiate MOUD was not different (23.8% vs 24.1%, OR 0.98, 95%CI 0.26 to 3.7, p=0.98).

Post-hoc analysis:

In univariate analyses, the diagnosis of PTSD (42.9% vs 10.1%, p=0.007) and prior history of discharge AMA (92.9% vs 44.9% p=0.001) were significant predictors of discharge AMA. These were entered into a binary logistic regression model. When adjusted, the odds ratio of discharge AMA for those on MOUD was 0.22 (95%CI 0.033 to 1.41, p=0.11), for those with diagnosis of PTSD was 8.5 (95%CI 1.6 to 44.1, p=0.011) and for those with prior history of discharge AMA was 10.9 (95%CI 1.3 to 95.2, p=0.030).

Discussion:

There is a growing recognition that hospital treatment of infectious complications from injection drug use must also include the treatment of the underlying substance use disorder.[8] Although only a minority of discharges were AMA, it was still much higher than expected in a general patient population and largely concentrated among those who were not already engaged in MOUD at the time of admission, confirming prior studies.[7] Individuals not actively engaged in MOUD may be more ambivalent about their recovery, may be experiencing opioid withdrawal or cravings, and may have fewer psychosocial supports or coping skills to tolerate the hospitalization. However, even those engaged with MOUD were nevertheless admitted for an infection, raising the possibility of ongoing injection drug use. Results may also suggest that individuals who leave the hospital AMA utilize this strategy repeatedly, and that individuals with PTSD may find the stressful nature of prolonged hospitalizations particularly difficult. These results therefore suggest that discharge AMA is a frequent outcome among PWID with endocarditis, and those with a prior history of discharge AMA as well as a diagnosis of PTSD may be particularly vulnerable to discharge AMA.

The majority of those admitted were not actively engaged in MOUD treatment at the time of admission, but almost half successfully initiated MOUD during the hospitalization. These results reaffirm the importance of making MOUD available to hospitalized individuals. Nevertheless, the prevalence of discharge AMA did not significantly differ between those who did and did not newly initiate MOUD during the hospitalization. There are several possible reasons for this negative finding. While medications may be helpful in reducing cravings and withdrawal, many may not tolerate the loss of freedom, privacy, and autonomy that accompanies prolonged hospitalizations. While initiation of MOUD should still be made available, previous research has found that initiation of MOUD in the hospital for PWID did not improve injection behavior after discharge, suggesting that PWID may be particularly vulnerable to ongoing injection drug use during and after hospitalization.[9] Another possibility for our findings is that our study was underpowered to detect a small but still clinically important reduction in AMA rates associated with MOUD initiation. Of note, those who did initiate MOUD had a longer hospital length of stay (29.5 days vs 17.8 days, p=0.016). The longer hospital stay would allow for patients to receive a longer duration of the antibiotics, and therefore would be an important area of further investigation. Taken together, these findings point to the importance of using hospitalizations as opportunities to continue or initiate MOUD treatment, but out-of-treatment OUD patients may require more intensive interventions than MOUD alone. Additionally, these results may point to the need

to provide long-term comprehensive treatment to address the range of psychosocial issues that these individuals face. Further research is needed to identify optimal interventions during the hospitalization to improve clinical outcomes for PWID with serious infections.

Despite the availability of evidenced-based pharmacotherapies, the rate of adoption of MOUD in the hospital setting has been inadequate.[11] The implementation of addiction consultation services is an important innovation which can increase the use of MOUD, reduce AMA discharges, help avoid readmissions, and increase linkage to outpatient addiction treatment.[4] The receipt of an addiction psychiatry consultation by nearly all of the individuals in this study may have contributed to the high rates of MOUD initiation. In addition to helping to resolve ambivalence for treatment using motivational interviewing strategies, the addiction consultants helped evaluate each individual for the suitability of initiating MOUD and addiction treatment following discharge. Further research is warranted on the impact of addiction consultation services to help ensure hospitalized PWID are receiving optimal care for their underlying substance use disorder.

Similar to prior studies, the prevalence of 30-day readmission was high (30.0%) among the PWID included in our study. Additionally, 50% of the individuals who were discharged AMA were readmitted within 30-days. Prior studies have reported prevalence ranging from 20 to 30% for patients who are discharged AMA.[3] Our study failed to show any association between MOUD use before or during the hospitalization on 30-day readmission. The reason for this may be due to the severity of the individuals' underlying medical issues, and that hospitalizations can be extremely disruptive to their lives, regardless of engagement with MOUD. Efforts to reduce readmissions may need to be tailored to PWID who may require more intensive efforts to avoid readmissions. More research is needed to understand the contributors to hospital readmission among PWID hospitalized for serious infections, whether they were discharged AMA or not.

There are several limitations to our study. This was a retrospective study of a small sample size from a single academic institution. Searches using free text may not have identified all possible charts for inclusion due to errors in documentation. We were limited in identifying readmissions only from medical records of our own healthcare system, leading to an underestimation of these events. The availability of an addiction psychiatry consultation service likely had an impact on MOUD initiation, making it difficult to extrapolate our findings to hospitals that lack an addiction consultation service. Additionally, some of the individuals in this study could have been discharged to home with suboptimal treatment, but not formally discharged AMA, leading to an underestimation of those events. We did not differentiate whether the substance use disorder (other than opioids) and psychiatric diagnoses identified were either current or in remission, which could have been associated with the outcomes of interest. As noted above, our study may have been underpowered to detect a small reduction in AMA rates associated with MOUD initiation. We did not extract data on pain control nor the use of opioid analgesics, which could have been skewed our results. Finally, the study was limited to those individuals with endocarditis, and our findings may not generalize to other types of serious infections.

PWID admitted for infective endocarditis experience high rates of discharge AMA, which occurred more frequently, although not statistically significant, among those not engaged with MOUD at the time of admission. MOUD initiation occurred in almost half of the out-of-treatment PWID, but it was not associated with a significant reduction in AMA discharges. More research on the optimal strategies to treat hospitalized PWID is needed to reduce the prevalence of discharge AMA.

Acknowledgments

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Table 1:

Summary of demographic and clinical variables comparing those who were and were not on MOUD at admission (n=84) and out-of-treatment individuals who did and did not initiate MOUD during the hospitalization (n=50).

	Total (n=84)	On MOUD at admission (n=34)	Not on MOUD at admission (n=50)	p	Newly initiated MOUD (n=21)	Did not initiate MOUD (n=29)	p
Age, mean years (SD)	36.2 (10.3)	33.8 (8.1)	37.9 (11.3)	0.07	39 (10.5)	37.1 (12.0)	0.56
Male Sex, n (%)	45 (53.6%)	19 (55.9%)	26 (52.0%)	0.73	10 (47.6%)	16 (55.2%)	0.60
Marital status, n (%)							
Single	59 (70.2%)	25 (73.5%)	34 (68.0%)	0.60	16 (76.2%)	18 (62.1%)	0.57
Married	14 (16.7%)	4 (11.8%)	10 (20.0%)		3 (14.3%)	7 (24.1%)	
Divorced	11 (13.1%)	5 (14.7%)	6 (12.0%)		2 (9.5%)	4 (13.8%)	
Race, n (%)							
Non-Hispanic White	70 (83.3%)	28 (82.4%)	42 (84.0%)	0.45	18 (85.7%)	24 (82.8%)	0.74
Non-Hispanic Black	5 (6.0%)	1 (2.9%)	4 (8.0%)		1 (4.85%)	3 (10.3%)	
Hispanic	8 (9.6%)	4 (11.8%)	4 (8.0%)		2 (9.5%)	2 (6.9%)	
Native American	1 (1.1%)	1 (2.9%)	0 (0.0%)		0 (0%)	0 (0%)	
Insurance, n (%)							
Medicaid	63 (75.0%)	27 (79.4%)	36 (72.0%)	0.70	18 (85.7%)	18 (62.1%)	0.13
Commercial	16 (19.1%)	5 (14.7%)	11 (22.0%)		3 (14.3%)	8 (25.6%)	
Uninsured	5 (5.9%)	2 (5.9%)	3 (6.0%)		0 (0%)	3 (10.3%)	
Substance history, n (%)							
Opioid use d/o	84 (100.0%)	34 (100%)	50 (100%)	1	21 (100%)	29 (100%)	1
Alcohol use d/o	15 (17.9%)	5 (14.7%)	10 (20.0%)	0.53	3 (14.3%)	7 (24.1%)	0.39
Amphetamine use d/o	8 (9.5%)	2 (5.9%)	6 (12.0%)	0.35	2 (9.5%)	4 (13.8%)	0.65
Sedative/hypnotic use d/o	14 (16.7%)	6 (17.6%)	8 (16.0%)	0.84	4 (19.0%)	4 (13.8%)	0.62
Cannabis use d/o	31 (36.9%)	13 (38.2%)	18 (36.0%)	0.84	10 (47.6%)	8 (27.6%)	0.15
Cocaine use d/o	52 (61.9%)	18 (52.9%)	34 (68.0%)	0.16	16 (76.2%)	18 (62.1%)	0.29
Tobacco use d/o	61 (72.6%)	26 (76.5%)	35 (70.0%)	0.51	14 (66.7%)	21 (72.4%)	0.66
Prior history of MOUD, n(%)	67 (79.8%)	34 (100.0%)	33 (66.0%)	<0.0001	17 (81.0%)	16 (55.2%)	0.058
Psychiatric history, n(%)							
Any Psychiatric diagnosis	63 (75.0%)	28 (82.4%)	35 (70.0%)	0.20	16 (76.2%)	19 (65.5%)	0.42
Any Mood d/o	50 (59.5%)	23 (67.6%)	27 (54.0%)	0.21	14 (66.7%)	13 (44.8%)	0.13
Any Anxiety d/o	34 (40.5%)	14 (41.2%)	20 (40.0%)	0.91	11 (52.4%)	9 (31.0%)	0.13
Post-traumatic stress d/o	12 (14.3%)	5 (14.71%)	7 (14.0%)	0.93	5 (23.8%)	2 (6.9%)	0.09
Receipt of addiction consultation, n (%)	82 (97.6%)	34 (100.0%)	48 (96%)	0.24	21 (100.0%)	27 (93.1%)	0.22
Length of stay, days (SD)	22.2 (16.7)	21.3 (16.2)	22.7 (17.2)	0.71	29.5 (21.9)	17.8 (10.7)	0.016
Discharge AMA, n (%)	14 (16.7%)	2 (5.9%)	12 (24.0%)	0.029	5 (23.8%)	7 (24.1%)	0.98
History of discharge AMA, n (%)	43 (51.2%)	11 (32.4%)	32 (64.0%)	0.004	14 (66.7%)	18 (62.1%)	0.74
Accepted for OPAT (%)	4 (4.76%)	2 (5.9%)	2 (4.0%)	0.69	1 (4.8%)	1 (3.4%)	0.82
30-day readmission, n (%)	25 (29.8%)	12 (35.3%)	13 (26.0%)	0.36	5 (23.8%)	8 (27.6%)	0.76

	Total (n=84)	On MOUD at admission (n=34)	Not on MOUD at admission (n=50)	p	Newly initiated MOUD (n=21)	Did not initiate MOUD (n=29)	p
MOUD type, n (%)							
Buprenorphine	31 (36.9%)	15 (44.1%)	-	-	16 (76.2%)	-	-
Methadone	22 (26.2%)	17 (50.0%)	-	-	5 (23.8%)	-	-
XR naltrexone	2 (2.4%)	2 (5.9%)	-	-	0 (0%)	-	-

MOUD=medications for opioid use disorder

AMA=against medical advice

XR=extended release

OPAT=outpatient parenteral antimicrobial therapy