7-2017

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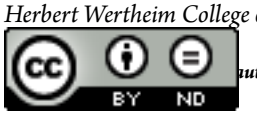
Thomas R. Campri
American University of Antigua College of Medicine

Sharon George
American University of Antigua College of Medicine

Diego Villacis
Universidad de las Américas

Melissa Ward-Peterson
Herbert Wertheim College of Medicine, Florida International University, mward@fiu.edu

Noel C. Barengo
Herbert Wertheim College of Medicine, Florida International University, nbarengo@fiu.edu



Authors
Thomas R. Campri, Sharon George, Diego Villacis, Melissa Ward-Peterson, Noel C. Barengo, and Juan C. Zevallos

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Effect of charted mental illness on reperfusion therapy in hospitalized patients with an acute myocardial infarction in Florida

Thomas R. Campi Jr, MD[a,*], Sharon George, MD[a], Diego Villacís, MD[b], Melissa Ward-Peterson, MPH[c], Noël C. Barengo, MD, MPH, PhD[c], Juan C. Zevallos, MD[c]

Abstract

Patients with mental illness carry risk factors that predispose them to excess cardiovascular mortality from an acute myocardial infarction (AMI) compared to the general population. The aim of this study was to determine if patients with AMI and charted mental illness (CMI) received less reperfusion therapy following an AMI, compared to AMI patients without CMI in a recent sample population from Florida.

A secondary analysis of data was conducted using the Florida Agency for Health Care Administration (FL-AHCA) hospital discharge registry. Adults hospitalized with an AMI from 01/01/2010 to 12/31/2015 were included for the analysis. The dependent variable was administration of reperfusion therapy (thrombolytic, percutaneous coronary intervention [PCI], and coronary artery bypass graft [CABG]), and the independent variable was the presence of CMI (depression, schizophrenia, and bipolar disorder). Multivariate logistic regression models were used to test the association controlling for age, gender, ethnicity, race, health insurance, and comorbidities.

The database included 61,614 adults (31.3% women) hospitalized with AMI in Florida. The CMI population comprised of 1036 patients (1.7%) who were on average 5 years younger than non-CMI (60.2±12.8 versus 65.2±14.1; $P < .001$). Compared with patients without CMI, patients with CMI had higher proportions of women, governmental health insurance holders, and those with more comorbidities. The adjusted odds ratio indicated that patients with CMI were 30% less likely to receive reperfusion therapy compared with those without CMI (OR = 0.7; 95% CI = 0.6–0.8). Within the AMI population including those with and without CMI, women were 23% less likely to receive therapy than men; blacks were 26% less likely to receive reperfusion therapy than whites; and those holding government health insurances were between 20% and 40% less likely to receive reperfusion therapy than those with private health insurance.

Patients with AMI and CMI were statistically significantly less likely to receive reperfusion therapy compared with patients without CMI. These findings highlight the need to implement AMI management care aimed to reduce disparities among medically vulnerable patients (those with CMI, women, blacks, and those with governmental health insurance).

Abbreviations: AMI = acute myocardial infarction, CABG = coronary artery bypass graft, CMI = charted mental illness, CVD = cerebrovascular disease, ER = emergency room, FL-AHCA = Florida Agency for Healthcare Administration, ICD 9 = International Classification of Diseases, ninth edition, Clinical Modification 2016, PCI = percutaneous coronary intervention, PTCA = percutaneous transluminal coronary angioplasty, SPSS = Statistical Package for the Social Science, STEMI = ST elevation myocardial infarction, VA = veterans affairs.

Keywords: bipolar disorder, coronary artery bypass, depression, fibrinolytic agents, myocardial infarction, percutaneous coronary intervention, schizophrenia

1. Introduction

Psychiatric patients experience greater mortality from cardiovascular disease compared with the general population.[1] Untreated patients with mental illness may have impaired cardio vagal modulation, autonomic dysregulation leading to subsequent vascular disease.[2] Psychological stress itself is one of the strongest contributing factors for coronary heart disease. Associations between psychological distress, cortisol response to laboratory-induced mental stress, and subclinical coronary artery calcification have been previously confirmed.[3] Psychiatric patients carry significant risk factors to undiagnosed cardiovascular disease such as the use of antipsychotics, sedentary lifestyle, smoking, hypertension, chronic obstructive pulmonary disease, hyperlipidemia, obesity, metabolic syndrome, and lack of access to healthcare.[4] The literature points out that 1 in 8 emergency room (ER) visits in the United States were due to mental health or substance use problems.[5] Repeated visits may predispose these

Editor: Heye Zhang.

The authors have no funding and conflicts of interest to disclose.

[a] American University of Antigua College of Medicine, Coolidge, Antigua and Barbuda, [b] Universidad de las Américas, Facultad de Medicina, Quito, Ecuador, [c] Department of Medical and Population Health Sciences Research, Herbert Wertheim College of Medicine, Florida International University, Miami, FL.

[*] Correspondence: Thomas R. Campi Jr, MD, University of California Berkeley School of Public Health, 50 University Hall, #7360, Berkeley, CA 94720-7360 (e-mail: thomas.campi@berkeley.edu).

Medicine (2017) 96:34(e7788)

Received: 9 March 2017 / Received in final form: 17 July 2017 / Accepted: 26 July 2017

http://dx.doi.org/10.1097/MD.0000000000007788

patients to early dismissal from the ER without a full medical work-up. According to a study from the Centers for Disease Control and Prevention, the 3 most common psychiatric illnesses presenting at the ER included schizophrenia, bipolar disorder, and depression.[6]

Current scientific evidence shows that patients with an acute myocardial infarction (AMI) who have charted mental illness (CMI) experience higher mortality than those without,[1–9] even though these patients diagnosed with STEMI (ST-elevation myocardial infarction) could benefit from efficacious evidence-based reperfusion techniques.[1] Patients with a charted history of schizophrenia, bipolar disorder, and depression have been specifically identified to receive less reperfusion therapy than those without these diagnoses.[10–12] These patients with schizophrenia, bipolar, and depression have a 2 to 3 times greater mortality than the general population and up to a 30-year shortened life expectancy. Studies have shown that patients with mental illness with concurrent AMI are given lower priority as measured by a triage score in the ER. Their presentation may be falsely perceived as psychosomatic in origin rather than ischemic.[13]

Although previous studies have examined a subset of AMI patients with CMI based on insurance type (Veterans Affairs, Medicare, Medicaid), these studies were based on national databases which focused primarily on elderly male patients.[14,15] There is a paucity of focused analysis on the potential disparity that the diagnosis of CMI may cause in the administration of reperfusion therapies in adult female and male patients hospitalized with an AMI in Florida. Furthermore, there is scarce data available on AMI patients with CMI residing in the United States within the past 5 years. Thus, the objectives of this study were to assess the association between CMI and the administration of reperfusion therapies (thrombolytic, PCI, and CABG) in all patients over the age of 18 with an AMI presenting to the hospital within the state of Florida from 2010–2015.

2. Methods

A secondary observational data analysis of the Florida Agency for Healthcare Administration (FL-AHCA) hospital discharge database (n = 481,880) was conducted. This manuscript follows the guidelines of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement.[16] The study participants consisted of men and women 18 years and older admitted to a Florida hospital from January 2010 to December 2015 with an AMI (n = 61,614). The *International Classification of Diseases, ninth edition*, *Clinical Modification 2016* (ICD-9-CM) codes were used to classify patients based on psychiatric illness, AMI, and cardiac interventions.[17] AMI was defined by ICD-9-CM diagnostic codes 410.00–410.52 and 410.80–410.92.[17]

The main independent variable was the presence of charted mental illness (CMI) in the form of schizophrenic, bipolar, and depressive disorders. CMI was defined according to the ICD-9-CM diagnoses that included schizophrenia (codes 295.00–295.95), bipolar disorder (codes 296.00–296.06, 296.40–296.80), and depression (codes 296.20–296.36).[17] The main dependent variable was the administration of reperfusion therapy in the form of thrombolytic drugs, PCI or CABG. Reperfusion therapy was defined by ICD-9-CM procedure codes (CABG codes 361.00–361.70, Angioplasty codes 00.66, 36.03, 36.06, 36.07 and Thrombolytic drug codes 36.04, 99.10).[17]

Covariates included age, gender, ethnicity, race, insurance and comorbidities of hyperglycemia, hypertension, hyperlipidemia, peripheral vascular disease, cerebrovascular disease, prior myocardial infarction, and tobacco use. Age was characterized by the following categories: 18–35, 36–45, 46–55, 56–65, 66–75, and >75. Ethnicity was categorized as either Hispanic or Non-Hispanic. Hispanic was defined as a person of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish culture or origin, regardless of race. Race was categorized as White, Black, or Other. Insurance was categorized as Private, Medicare, Medicaid, Other Governmental, or Uninsured. Private coverage included HMO, PPO, commercial liability coverage, or other self-insurance plans. Other Governmental coverage included Workers' Compensation, VA, TriCare, KidCare, or other state/local governmental programs. Uninsured was defined as self-pay, charity, research/clinical trial, donation, professional courtesy, no charge, refusal to pay/bad debt, Hill Burton free care.

The comorbidities were also defined by ICD-9-CM and included hyperglycemia (codes 249.00–250.93, 271.80–271.90, 272.10), hypertension (codes 401.00–405.99), hyperlipidemia (codes 272.00, 272.20–272.90), peripheral vascular disease (codes 450.00–459.90), cerebrovascular disease (codes 430.00–438.90), prior myocardial infarction (code 412.00), and tobacco use (code 350.10).[17]

2.1. Ethical considerations

The Florida Agency for Health Care Administration (FL-AHCA) hospital discharge database includes only de-identified information. Therefore, this study was classified by the Florida International University Health Sciences Institutional Review Board (IRB) as non-human subject research, and thus, IRB approval was not required.

2.2. Statistical analysis

SPSS 22 (IBM, Armonk, NY) was utilized for statistical analysis. Descriptive analysis was conducted by examining mean and standard deviation for continuous variables and frequency distributions for categorical variables. Chi square tests were used to examine bivariate associations between categorical variables. Binary logistic regression was used to estimate unadjusted and adjusted odds ratios with 95% confidence intervals. The adjusted multivariable model included factors that were associated with both CMI and reperfusion therapy at $P < .05$ or factors that were deemed clinically important. Pearson correlation analysis was applied to ensure variables included in the adjusted model were not highly correlated with one another.

3. Results

Among 61,614 patients with AMI, 1.7% (n = 1036) patients had CMI. The mean age of the CMI and non-CMI subgroups were 60.2 ± 12.8, and 65.2 ± 14.1 years, respectively ($P < .001$). The study population comprised of 31.3% (n = 19,286) women. Of the patients with CMI, 49.7% (n = 567) had bipolar disorder, 27.5% (n = 314) had depression, and 8.6% (n = 207) patients had schizophrenia. Nine patients (0.8%) had both depression and bipolar disorder, 37 patients (3.2%) had both schizophrenia and bipolar disorder and 6 patients (0.5%) had both depression and schizophrenia. This accounted for 4.6% of patients with at least 2 concurrent mental illnesses.

Table 1 shows the baseline characteristics of AMI patients with and without CMI, which illustrates demographic and clinical

Table 1

Baseline characteristics of patients with acute myocardial infarction in Florida 2010–2015 according to charted mental illness (n = 61,614).

	Charted mental illness (CMI)		
	CMI (n = 1036) %	Without-CMI (n = 60,578) %	*P*
Age, years, mean ± SD	60.2 ± 12.8	65.2 ± 14.1	<.001
Age groups, years 18–35	2.3	1.2	
36–45	9.7	6.6	
46–55	27.1	20.2	
56–65	32.0	27.0	
66–75	18.1	22.5	
>75	10.7	22.5	
Gender			<.001
Men	59.5	68.9	
Women	40.4	31.1	
Ethnicity			.514
Hispanic	14.1	14.6	
Non-Hispanic	85.9	85.4	
Race			<.001
White	87.0	83.6	
Black	8.7	8.9	
Other	4.3	7.5	
Health insurance			<.001
Private	12.7	26.4	
Medicare	56.6	48.7	
Medicaid	17.9	7.4	
Other governmental	4.2	3.4	
Uninsured	8.6	14.0	
Comorbidities			
Hyperglycemia	37.1	31.8	<.001
Hyperlipidemia	60.2	63.5	.068
Hypertension	56.9	58.4	.355
Peripheral vascular disease	22.5	18.7	.004
Cerebrovascular Disease	5.5	4.0	.011
Old myocardial infarction	11.3	8.7	.003
Tobacco use	44.9	31.6	<.001

CMI = charted mental illness, SD = standard deviation.

Table 2

Associations between demographic/clinical characteristics according to administration of reperfusion therapy in the study population (n = 61,614).

	Reperfusion therapy		
	No (n = 13,950)	Yes (n = 47,664)	
	(%)	(%)	*P*
Charted mental illness		<0.001	
No	22.5	77.5	
Yes	29.9	70.1	
Age groups, years			<.001
18–35	25.1	74.9	
36–45	16.5	83.5	
46–55	15.3	84.7	
56–65	18.9	81.1	
66–75	23.9	76.1	
>75	24.3	75.7	
Gender			<.001
Men	20.1	79.9	
Women	28.3	71.7	
Ethnicity			<.001
Hispanic	20.6	79.4	
Non-Hispanic	23.2	76.8	
Race			<.001
White	22.5	77.5	
Black	27.4	72.6	
Other	20.5	79.5	
Health insurance			<.001
Private	15.5	84.5	
Medicare	28.6	71.4	
Medicaid	25.1	74.9	
Other governmental	19.1	80.9	
Uninsured	14.7	85.3	
Comorbidities			
Hyperglycemia	25.1	74.9	<.001
Hyperlipidemia	19.4	80.6	<.001
Hypertension	20.0	80.0	<.001
Peripheral vascular disease	30.2	69.8	<.001
Cerebrovascular	37.6	62.4	
Vascular disease			<.001
Old myocardial infarction	28.6	71.4	<.001
Tobacco use	16.6	83.4	<.001

data of study population. As compared with patients without CMI, patients with CMI were on average 5 years younger. Overall, the proportion of patients without CMI increased with age and approximately half of the patients with CMI were between 46 and 65 years old. As compared with patients without CMI, less than half of CMI patients had private health insurance. Patients with CMI had higher proportion of comorbidities such as hyperglycemia, peripheral vascular disease, cerebral vascular disease, and old myocardial infarction. The greatest percentage difference in comorbidity between CMI and non-CMI patients was found in tobacco use.

There were approximately 7% more patients with CMI who did not receive reperfusion therapy compared with those patients without CMI (see Table 2), which illustrates the associations between administration of reperfusion therapy, charted mental illness, and demographic/clinical characteristics. The proportion of patients not receiving reperfusion therapy was highest in those aged over 75 years. Administered reperfusion therapy was 8.2% lower in women compared with men. Blacks received less reperfusion therapies compared with whites. Patients identified by "other" races had a higher prevalence of receiving reperfusion therapy compared with white and black races. Patients holding Medicare, Medicaid, or other governmental health insurance also received less reperfusion therapy compared with those holding private health insurance. Patients diagnosed with hyperglycemia, peripheral vascular disease, cerebrovascular disease, and a previous myocardial infarction received less reperfusion therapy than patients without those comorbidities.

The results of the unadjusted and adjusted logistic regression models assessing the association between administration of reperfusion therapy, charted medical illness (CMI), and other demographic and clinical characteristics are presented (see Fig. 1). The unadjusted model showed that those patients with CMI were 31.9% less likely to receive reperfusion therapy compared with those patients without CMI (OR = 0.7; 95% CI = 0.6–0.8). Patients aged 46 to 55 years were more likely to receive reperfusion therapy (OR = 1.9; 95% CI = 1.6–2.2), whereas those older than 75 years old were less likely to receive reperfusion therapy (OR = 0.6; 95% CI = 0.5–0.8). Furthermore, patients with hyperglycemia, peripheral vascular disease, cerebrovascular disease, and old myocardial infarction were less likely to receive therapy than their counterparts without these comorbidities.

Through the adjusted analysis, it was found that within the entire AMI population including CMI and non-CMI patients, the adjusted odds of receiving reperfusion therapy remained

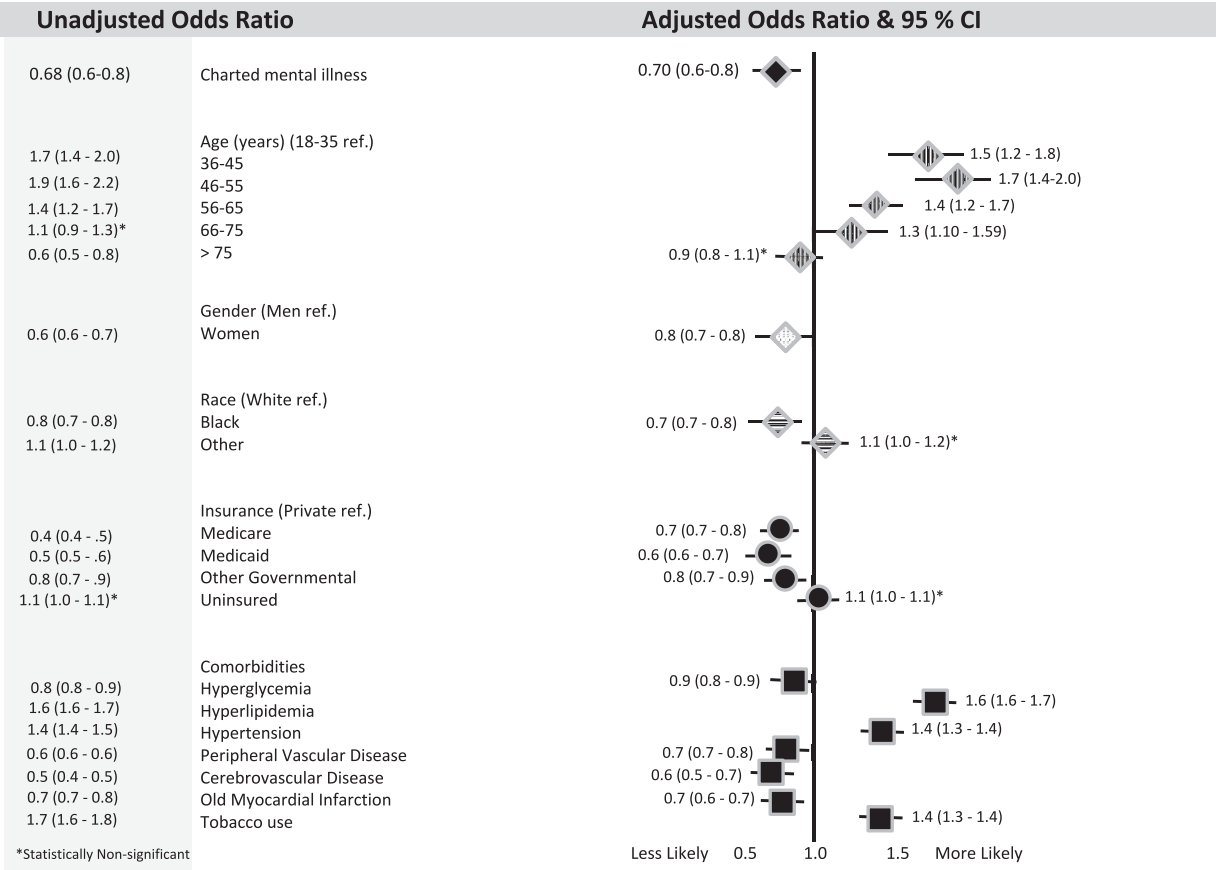

Figure 1. Covariates affecting odds of reperfusion therapy in AMI patients. AMI = acute myocardial infarction.

statistically significant lower for those with CMI (30%) for women (20%) for blacks (30%) and for governmental insurance holders (20–40%), compared with those without CMI, for men, for whites, for private health insurance holders. Finally, the adjusted regression model also showed statistical significance in that patients were less likely to receive reperfusion therapy if they had hyperglycemia (10%), peripheral vascular disease (30%), cerebrovascular disease (40%), and a old myocardial infarction (30%) than those without those comorbidities.

4. Discussion

This study showed that AMI patients with CMI received less reperfusion therapy compared to AMI patients without CMI, independent of covariates. Results obtained from this study are consistent with those from previous ones conducted in the United States and abroad revealing that patients with mental illness experience lower revascularization resulting in higher mortality.[1,2,4,9,12–15] These findings have been reported from previous retrospectively designed studies that utilized physician charting of ICD codes[1,2,4,9,12–15] and from those that included younger patients.[1,2,9,12] The disparity in receiving reperfusion therapy may be due to a combination of factors including preconceived assumptions about lower compliance rates and greater risky behaviors in the mentally sick population, hospital staff bias, and behavioral/social limitations of psychiatric patients. In addition, patients with mental illness and AMI maybe unable to express their symptoms fully in the ER which may contribute towards inaccurate triaging in the ER and the consequent increase on in-hospital mortality.

A gender gap in reperfusion therapy in the psychiatric population was demonstrated in this study. Future research needs to explore the underlying reason and how physicians can increase revascularization in women, specifically women with CMI. Therefore, it is of concern that this subset received the least revascularization in this study, as they generally experience a higher incidence of STEMI compared to the general population.[1] Higher level of guidelines should not only address cardiac management for women as a group, but also cardiac management for elderly women with CMI. It is imperative that vulnerable CMI populations receive access to invasive cardiac services despite assumptions about compliance to cardiac rehabilitation.

Women were included in this analysis because this population has been excluded before,[14,15] which limited research in regard to the equality of cardiac care. Within the AMI population in this study, there was a higher proportion of females with CMI (40.4%), compared to females without CMI (31.1%). Furthermore, the results from this study point out that there was a higher proportion of females (28.3%) who did not receive reperfusion compared to males (20.1), even when all other covariates, including status of CMI was excluded for examination. These findings demonstrate the need to fully assess these women without judgement or preconceived notions when first presenting to the ER.

Patients with bipolar disorder, schizophrenia are more likely to be older women with comorbidities. Elderly patients in general are vulnerable as they have greater medical comorbidities, psychiatric illnesses, and receive less invasive cardiac procedures compared to patients without mental illness.[14] Furthermore, mentally ill Medicare patients have been shown more likely to be elderly females.[14] The demographic receiving the least revascularization among CMI with AMI patients in this study align closest to the results from Li et al,[13] in that patients with both AMI and CMI receiving the least cardiac catheterization tend to be older women. This, however, may be attributed to the fact that Li et al[13] solely studied Medicare patients. Similarly, the demographic that received the least revascularization in this study were older, black, female Medicare recipients with more comorbidities. However, several studies note that AMI with CMI patients are actually younger.[1,2,14,15] This may be due to the fact that younger onset psychiatric illness correlates with worse physical health.

With regard to race, the results showed that a higher proportion of AMI with CMI patients were of black race, which was also demonstrated by Schulman et al.[1] With regard to race, less odds of revascularization for black patients interestingly oppose the results from Petersen et al,[14,15] as they conclude that there are reduced healthcare disparities for blacks in the VA healthcare system both with and without mental illness.

In the analysis of ethnicity, the study decided to compare between Hispanics and non-Hispanics. White race and black race could fit into either category. The highest proportion of AMI with CMI was non-Hispanic whites. This may simply be related to the higher number of persons in this subset within the general population of Florida who present to the hospital with AMI. In the non-reperfused population, the highest proportion of patients belonged to the black race (27.4%) compared to whites (22.5%), and others (20.5%). This finding shows physicians may need to screen and examine AMI patients belonging to the black race more carefully in the ER to prevent dismissing early revascularization.

In terms of insurance, almost 88% of the AMI with CMI population were either governmental insurance holders or uninsured. Medicare insurance holders comprised approximately at least 50% of both the CMI and non-CMI populations. Medicare patients had a higher proportion of patients who did not receive reperfusion therapy (28.6%) compared to Medicaid (25.1%), other governmental (19.1%), and private (15.5%), and uninured (14.7%) patients. The highest proportion of patients who indeed received reperfusion therapy was patients who had to pay out of pocket or received assistance through charity (85.3%), followed by private insurance holders (84.5%). Medicare patients comprised the lowest proportion of patients who indeed received reperfusion at 71.4%. Again, it is crucial to critically examine patients within this insurance category to remove disparity in cardiac care.

Concerning comorbidities, hyperlipidemia and hyperglycemia were the 2 largest disorders affecting the AMI population. There was a higher proportion of CMI patients with hyperglycemia, peripheral vascular disease, cardiovascular disease, and old myocardial infarction. Concerning comorbidities, hyperlipidemia and hypertension were the two largest disorders affecting the AMI population. There was a higher proportion of CMI patients with hyperglycemia, peripheral vascular disease, cerebrovascular disease, and old myocardial infarction. The highest proportion of non-reperfused patients were those with cerebrovascular disease (37.6%) followed by peripheral vascular disease (30.2%). This may be due to absolute and relative contraindications to reperfusion as confirmed by the physician in charge. This study did not examine contraindications to reperfusion therapy which affected the analysis of examining why specific subsets of the AMI population did not receive reperfusion therapy. This can be an interesting area of focus in future studies. Future work can explore why specific comorbidities are receiving less reperfusion therapy if not related to contraindications to therapy.

There were marked differences between this study and others found in the published literature regarding reperfusion therapy in psychiatric patients with AMI, which makes this study unique and a jumping point for focused research on this topic in the future. Areas of difference included the inclusion criteria, methods, outcome measures, and exclusion criteria. Previously published studies have differed in their inclusion criteria compared to this study, specifically in regard to age, sex, insurance, hospital data, and the definition of mental illness.

This study included both male and female AMI patients 18 years and older, as some have suggested that AMI with CMI patients are relatively younger.[1,2,10] Yet, it has been shown that AMI with CMI patients are elderly patients as this study also shows.[13] Studies which specifically studied Medicare patients, limited their analysis to patients older than 65 years old.[4,13]- Others chose to solely examine VA hospital patients, limiting their analysis to only male patients.[14]

Furthermore, insurance status of patients wavered between this study and published literature. Some studies[14] only examined VA hospitals whose patients were men, whereas other studies only examined Medicare patients[4,13] who may have had other confounding variables which contributed to their health status. This study examined all insurance types including those with no insurance to thoroughly explore the relationship between insurance status and receipt of reperfusion therapy.

Other differences in inclusion criteria comprised hospital setting and hospital type of the AMI admission, which would dramatically affect the database of AMI patients. This study was unique because it only looked at the state of Florida and included data from all types of Florida hospitals with AMI admissions, thus allowing for a thorough analysis of healthcare practices within this state. Other studies have solely looked at national databases in the United States[1,4,13–15] or other countries such as Taiwan,[9] Sweden,[2] and Canada.[12] Previously created databases have sometimes only focused on data gathered from specific hospital type, whether it be community non-federal hospital,[1] VA hospital,[14] or acute care hospital.[4,12]

The definition of mental illness differed between this study and others. This study includes schizophrenia, bipolar disorder, and depression in the definition of mental illness. Some of the previously published studies defined mental illness to include only bipolar disorder and schizophrenia.[9] Others defined it as only schizophrenia.[2,4] Some defined it as only bipolar disorder,[10] and Peterson et al[14] included substance abuse in their definition of mental illness. Since this study incorporates depression in the mental illness category, it progresses the work of Atzema et al[12] who examined depression and reperfusion and found that depressed patients had a 9 times greater likelihood of missing door-to-balloon times. Depressed patients in this study indeed received less revascularization compared to non-CMI patients.

The methods utilized in this study differed compared to the published literature in this area of research. This study was

similar to a retrospective cohort study like previous studies,[1,2,4,12–14] but differed than other studies that were case-control[9] or even based on computer-assisted patient interviews.[10] Time period of the database also differed between this and other studies, which may have led to different results based on hospital practices within certain time frames. This study has been the most recent compact database from the years 2010–2015. Older studies from the past couple decades sometimes only looked at 1 year,[4,10,12–14] whereas others included a broader, but older time frame greater than 5 years.[1,2,9]

To continue, this study also differed in terms of outcome measures compared to previous studies. The outcome measure of this study were the odds of revascularization in terms of thrombolytic therapy, CABG, and PCI, which differed compared to other studies. Outcome measures from previous studies included ER triage score,[12] in-patient mortality,[1] 30-day mortality,[14] 1-year mortality rates,[14] 30-day readmission rates,[13] door to EKG time,[12] door to balloon time,[12] and door to needle time.[12] Furthermore, covariates which were not included for analysis in this study, but have been used in previous studies[13] included income, zip code of patient home, and high school graduation status.

Finally, this study differed from previous studies in terms of exclusion criteria. Some studies did not include "Do Not Resuscitate" patients in their study population.[4] Others choose to exclude patients with contraindications to therapy.[14] This study chose not to include specific contraindications to therapy when choosing covariates in order to increase eligible study participants.

Naturally, this study had some limitations. In regard to study design, differences between administration of each modality of reperfusion therapy (fibrinolytic, PCI, and CABG) and CMI status were not individually explored. Reperfusion therapy was analyzed as a combined entity. This may have led to a more thorough analysis, since there is a time sensitivity to each procedure. The procedure with the shortest onset from hospital admission to procedure time may have been the least used for CMI patients. These data would have also shown the latest trend in the invasive cardiac procedure usage in Florida. Moreover, CMI patients actually receiving reperfusion therapy were not stratified according to demographic data. Thus, it was not possible to examine how administration of reperfusion therapy differed within the CMI population in regard to age, gender, ethnicity, race, and insurance. Finally, socio-economic status was not examined, which may have brought more insight into the demographic of patients receiving revascularization therapy.

The major strength of this study was that the population of interest stemmed from a Florida statewide database comprised of over 61,000 confirmed AMI patients. Furthermore, the recent time period of the database may better highlight current disparities in Florida hospitals within the past decade, and possibly other states in the United States, with respect to patients with mental illness and acute myocardial infarction. Finally, the inclusion criteria examined younger patients with AMI, which brings new insight to younger onset AMI with CMI.

In conclusion, the study findings may have several clinical and public health implications in the state of Florida. For example, findings may ultimately promote optimal treatment of an AMI through an earlier recognition of AMI onset of symptoms and timely diagnosis and treatment in the psychiatric population. This study highlights that a higher standard of cardiac management should be provided to psychiatric patients. Future analysis of this study can examine outcomes in AMI patients with CMI in terms of 30-day and 1-year mortality, recurrent infarction, and readmission rates. Policies regarding consent, objective charting of mental illness, and a creation of a fast-track in the ER specifically for psychiatric patients should be implemented in order to provide optimal care to this population and improve mortality. National guidelines regarding cardiac intervention for thrombolytic, PCI, and CABG should specifically address mentally sick patients since cardiovascular disease is a significant risk factor for mortality in this group. Improved national screening and prevention guidelines for AMI need to be created to address significant risk factors (hyperlipdemia, hypertension, hyperglycemia, smoking) for these patients. Expansion on this study can explore individual psychiatric illnesses to examine which psychiatric illness receives the least revascularization compared to other psychiatric illnesses. This may aid health care providers to heighten their awareness of AMI in this specific population. Lastly, further studies need to explore why there is disparity in management of acute myocardial infarction in patients with mental illness in Florida and possibly other states in the United States.

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