International Journal of Medical Research Professionals
P-ISSN: 2454-6356; E-ISSN: 2454-6364
DOI: 10.21276/ijmrp

Original Research Article.

Causes and Predictors of Hospital Readmissions After Ischemic Ventricular Tachycardia Ablation

Rohit Rattan[1*], Vikas Singh[2], Prabhjot Bedi[2], Karandeep Bumrah[2], Ramanjeet Singh[3], Ashish Sharma[4]

[1]M.D. Baystate Medical Center, 759 Chestnut Street, Springfield MA 01199, USA.
[2]M.D. UPMC East Hospital, 2775 Mosside Boulevard, Monroeville, PA 15146, USA.
[3]M.D. Kern Medical Center, 1700 Mount Vernon Avenue, Bakersfield, CA 93306, USA.
[4]M.D. UPMC Mercy Hospital, 1400 Locust Street, Pittsburgh, PA 15219, USA.

ABSTRACT

Introduction: Ablation is an established therapy in patients with coronary artery disease (CAD) and sustained Ventricular Tachycardia (VT).

Method: We examined the 30-day readmission rates in patients undergoing ischemic VT ablation using the Nationwide Readmissions Database (NRD) for the year 2013. Patients with principal diagnosis of VT were identified using ICD 9 diagnosis code of 427.1; Ablation procedure was identified using ICD 9 procedure code 3734. Patients with secondary diagnosis of arrhythmia were identified using clinical classification software (CCS) code 106 and were excluded from study cohort to exclude any patients undergoing ablation for arrhythmias other than VT. Patient with secondary diagnosis of CAD were identified using CCS code of 101 and were defined as ischemic VT ablation patients.

Results: The primary outcome was 30-day hospital readmission and its predictors. From a total of 1,609 admissions for ablation for ischemic VT, 280 patients (17.4%) were readmitted within 30 days. Reasons for readmission included cardiac causes (69.6%), predominantly for recurring VT (46.7%) or congestive heart failure (CHF, 16.6%). Many patients readmitted for VT (36.4%) required repeat ablation. The independent predictors of 30-day readmission in this population included CHF (Odds ratio, 95% confidence interval, p value: 1.738, 1.300-2.324, p < 0.001), chronic obstructive pulmonary disease (1.583, 1.138-2.201, p=0.006), chronic kidney disease (1.395, 1.028-1.769, p=0.031), and diabetes mellitus (1.348, 1.028-1.769, p=0.031). Paradoxically, older age (>79 years) was protective against readmission (0.550, 0.309-0.979, p=0.042).

Conclusion: Patients undergoing ischemic VT ablation have a high rate of 30-day readmissions particularly those with other comorbidities. This finding deserves further investigation into whether other palliation therapies are warranted in these patients.

Keyword: Ischemic Ventricular Tachycardia; Ablation; Readmission; Predictors.

***Correspondence to:**

Dr. Rohit Rattan,
759 Chestnut St,
Springfield MA 01199 USA.

Article History:

Received: 27-04-2020, **Revised:** 18-05-2020, **Accepted:** 31-05-2020

Access this article online	
Website: www.ijmrp.com	Quick Response code
DOI: 10.21276/ijmrp.2020.6.3.007	

INTRODUCTION

Up to 20% of Medicare beneficiaries are known to have readmissions within 30 days of an index hospitalization (1, Li et al). Although 30-day readmission rates of major medical diseases like congestive heart failure (CHF) are known (2, Arora et al), this has not been studied in the specific group of patients undergoing ventricular tachycardia (VT) ablation in the context of ischemic heart disease. VT ablation is used as curative strategy for non-ischemic VT and as adjunctive therapy in the management of patients with ischemic cardiomyopathy who suffer from implantable cardioverter defibrillator (ICD) shocks (3, Priori et al). There is paucity of information regarding 30-day readmission rates post ischemic VT ablation. Accordingly, the primary objective of this study is to evaluate 30-day readmission rates in this specific population and examine the predictors of readmission in such patients.

MATERIALS AND METHODS

The study cohort was derived from Healthcare Cost and Utilization Project's National Readmission Data (NRD) of 2013, sponsored by agency of Healthcare Research and Quality. NRD is one of the largest available, all-payer inpatient databases in the United States.

This included data on approximately 14 million discharges in the year 2013 from 21 contributing states. The weighted data estimates roughly 36 million discharges that represent 49.1% of total admission in the US. The details regarding the NRD data are available online (4, Health Cost and Utilization Project).

Patients are identified using International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) diagnosis code as well as Clinical classification software (CCS) developed by the Agency for Healthcare research and Quality (AHRQ).

As VT ablation has no specific ICD-9-CM code, patients were identified using a combination of principal diagnosis of VT (ICD-9-CM code 427.1) and procedural diagnosis of ablation (ICD-9 procedure code 3734).

As ablation can also be performed in patients with secondary diagnoses of atrial fibrillation, atrial flutter, or supraventricular tachycardia, these patients were identified using a secondary diagnosis CCS code of 106 and were excluded from the analysis. Patients who have secondary diagnosis of Coronary Artery Disease (CAD) as identified by CCS code 101 were considered to have ischemic VT.

Readmission is defined as an admission within 30 days after discharge from an index admission. Readmission is identified using "NRD_visitlink" that identifies all hospitalizations for the same individual. The chronological order of all the admission for one individual is established by the variable "NRD_DaysToEvent". Readmission timing was calculated by subtracting "NRD_DaysTOEvent (readmission – index hospitalization). Length of stay (LOS) of index hospitalization is also subtracted from this value to obtain accurate estimate of readmission timing.

National estimates are estimated using sampling weights provided by NRD. All the readmissions falling between 30-day window post index hospitalizations are included. We excluded index admissions falling in the month of December, as we did not have 30 days of follow-up from the index hospitalization within the 2013 dataset.

The primary outcome of our analysis is 30-day readmission rates in patients post ischemic VT ablation and the predictors of readmission. The primary cause of readmission was identified using ICD-9-CM code as well as CCS code for principal diagnosis of readmission.

The use of CCS codes to identify readmission simplifies sorting of the data by grouping similar diagnoses into clinically important groups, as described in the NRD. Prepopulated NRD variables are used to identify patient's demographic characteristics including age, gender, length of stay (LOS), death, disposition, elective procedures and number of chronic conditions. Co-morbidities are identified using ICD-9-CM as well as CCS software (see supplement).

STATA 15 was used for all statistical analyses. Differences between the 'readmission' and 'no readmission' groups are calculated using chi-square test for categorical variables and independent t test for continuous variables. Univariate and multivariate regression was performed to calculate predictors of readmission. Multivariate regression is adjusted for age, gender and co-morbidities. Only those variables, which are observed to be significant predictors of readmission with univariate regression analyses were included in the multivariate regression. A 2-sided p value < 0.05 was considered statistically significance

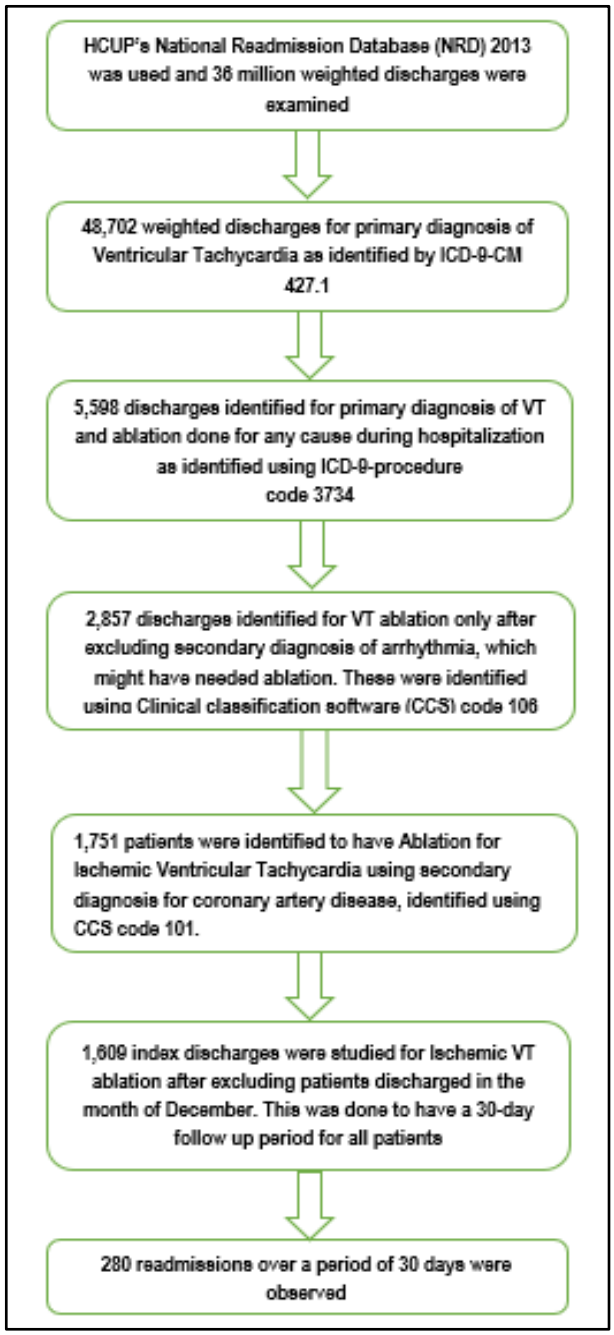
SUPPLEMENT DATA FOR CODING

Table 1: Coding of co-morbidities using ICD-9-CM and CCS codes

Co-morbidity	Code used
Ventricular Tachycardia (VT)	ICD-9-CM 427.1
Ablation	ICD-9 procedure code 3734
Obesity	ICD-9-CM 27800, 27801
Complication of device/procedure	ICD-9-CM 99601, 99604, 99661, 99812,99883
Thyroid disorder	CCS 48
Diabetes Mellitus (DM)	CCS 49, 50
Hypertension (HTN)	CCS 98, 99
Myocardial Infarction (MI)	CCS 100
Cardiac Arrest and Ventricular Fibrillation (CA & VF)	CCS 107
Transient ischemic attack (TIA) and Stroke	CCS 109, 112
Lipid disorder	CCS 53
Peripheral arterial disease (PAD)	CCS 114
Acute kidney injury (AKI)	CCS 157
Chronic kidney disease (CKD)	CCS 158
Syncope	CCS 245
Chronic obstructive pulmonary disease (COPD)	CCS 127
Congestive Heart Failure (CHF)	CCS 108
Arrhythmia	CCS 106
Coronary artery disease (CAD)	CCS 101
Pericarditis/endocarditis/myocarditis	CCS 97
Electrolyte disorder	CCS 55
Valve disorder	CCS 96
Coagulation disorder	CCS 62
Pulmonary heart disease	CCS 103
Respiratory failure	CCS 131
Anemia	CCS 59,60
Implantable cardioverter defibrillator (ICD) related	CCS procedure code 48

Table 2: Breakdown of readmission categories

Readmission group category	Co-morbidity using CCS
Congestive Heart Failure	Congestive heart failure (108)
Other Cardiac	Aortic/peripheral aneurysm (115), Syncope (245), Cardiac Arrest and Ventricular Fibrillation (107), Coronary Artery Disease (101), nonspecific chest pain (102), Acute Myocardial Infarction (100)
Gastrointestinal system	Gastrointestinal bleed (153), intestinal obstruction (145)
Infection	Septicemia (2), Mycoses (4), Pneumonia (122), Urinary tract infection (159), Fever of unknown origin (246)
Complications of device/procedure	Complications of device/implant/graft (237), complications of surgical procedure (238)
Respiratory system	Chronic Obstructive Pulmonary Disease (127), Respiratory failure (131)
Renal	Acute kidney injury (157)
Others	Excluding all above



RESULTS

We identified a total of 48,702 weighted discharges for VT as a primary diagnosis and of those 5,598 discharges were associated with an ablation procedure. After excluding patients who had secondary diagnosis of other arrhythmias (CCS code 101), 2,877 discharges after VT ablation remained. After excluding patients with no diagnosis of coronary artery disease (CCS code 101) and those discharges that took place in the month of December, 1,609 weighted discharges for ischemic VT ablation remained and were included in the final analyses (Figure 1)

In-hospital mortality was observed in 52 patients (3.3%). A total of 280 patients (17.4%) were readmitted within 30 days of the index hospitalization for ischemic VT ablation. Only 1 death occurred during readmission. The readmission patients had significant burden of hypertension (69.7%), congestive heart failure (CHF) (60%), lipid disorders (57.5%), implantable cardioverter defibrillator (ICD, 55%), diabetes mellitus (DM, 33.5%), chronic kidney disease (CKD, 19.3%), and chronic obstructive pulmonary disease (COPD, 15.8%) (Table 3). As compared to patients without readmission, readmitted patients were more likely to be women (90% vs 86.2%, p=0.057), had a higher median length of stay (LOS) (5 days vs.4 days, p=0.001), were more likely discharged to a nursing facility as opposed to home (8.1% vs. 4.1%, p=0.004) and had a higher burden of non-elective admissions during their index hospitalization (75.5% vs.67.7%, p=0.038). There was no significant difference in cost of hospitalization in readmitted and non-readmitted patients (Table 4).

Most of the readmissions occurred within first 2 weeks (median 12 days, quartile range 5-18 days). Among the causes for readmission, cardiac etiologies (68.5%) were the most common, with recurring VT being the most common (46.7%), followed by CHF (16.6%) as detailed in Table 4. Of the total number of readmitted patients, 17.5% of patients had repeat VT ablations. The independent predictors of 30-day readmission in patients who underwent ablation of VT in context of CAD included a history of CHF (Odds ratio, 95% confidence interval, p value: 1.738,1.300-2.324, p<0.001), COPD (1.583,1.138-2.201, p=0.006), CKD (1.395,1.028-1.769, p=0.031), DM (1.348,1.028-1.769, p=0.031). Older age (>79 years) on the other hand was protective against readmission (0.550, 0.309-0.979, p=0.042). (Table 5)

DISCUSSION AND CONCLUSION

The major findings of our report are: (1) The 30-day rate of readmission after ischemic VT ablation is elevated (17.4%); (2) the majority of readmissions are due to cardiac etiologies, primarily VT or CHF; (3) Many patients with readmission after VT ablation undergo repeat VT ablation (17.5%) (4) A high burden of comorbidities at baseline including CHF, COPD, DM, and CKD was predictive of readmission within 30 days after ischemic VT ablation.

CAD patients often have VT with symptoms. The ICD is indicated for VT management in patients with low ejection fraction or prior ventricular arrhythmias, many of whom receive painful shocks from their device, mostly within the first year after implantation (5-7, Moss et al, Buxton et al, Connolly et al). Recurrent ICD shocks are associated with reduced quality of life and are markers of poor prognosis (8-12, Scron et al, Carroll et al, kamphius et al, Poole et al, Moss et al). Anti-arrhythmic drugs (AAD) are used for palliation but are often ineffective. Ablation of VT is used as adjunctive therapy in such patients and is associated with lesser ICD shocks as compared to AAD therapy alone (13-16, Marchlinski et al, Soejima et al, Reddy et al, Kuch et al,) and is therefore often prescribed for palliation in a large subset of these patients.

Despite better outcomes as compared to AAD alone, Ablation therapy for VT has up to 50% rate of recurrence at the end of 6 months and has no salutary impact on mortality (17-18, Tanner et al, Stevenson et al). Our results agree with previous reports of elevated recurrence rates of VT post ablative therapy in patients with CAD and provide insight into short-term outcomes. Most of the readmissions occurred secondary to VT and CHF, reinforcing that VT ablation in this context is palliative rather than curative. A significant number of patients with recurrent VT required repeat ablation procedures shortly after the index procedure, which adds to the cost and risk of management of these patients (19, Kosmidou et al).

Table 3: Baseline characteristics during index hospitalization.

Variable	Total patients	Readmitted	Not readmitted	p value
Age in years (Median, quartile range)	67(60-74)	67(62-73)	66(60-74)	0.278
Female gender	10.7%	13.8%	10%	0.057
Cost of hospitalization in $ (Median, quartile range)	1,02,964 (71,783-1,61,009)	94,345 (71,745-1,52,150)	1,03,704 (71,862-1,64,603)	0.762
Length of stay (median, quartile range)	4(2-8)	5(3-8)	4(2-7)	0.001
Co-morbidities (median, quartile range)	8(6-10)	8(7-10)	8(6-9)	<0.001
Elective Admission	30.8%	24.5%	32.2%	0.038
Discharge to home	89.4%	89.4%	89.3%	0.929
Discharge to facility	4.8%	8.1%	4.1%	0.004
Co-Morbidities				
Congestive Heart Failure	60%	72.4%	57.4%	<0.001
Chronic Obstructive Pulmonary Disease	15.8%	22.5%	14.4%	0.001
Chronic Kidney Disease	19.3%	26.4%	17.8%	0.001
Diabetes Mellitus	33.5%	40.8%	31.9%	0.005
Thyroid disorder	13.3%	15%	12.9%	0.357
Hypertension	69.7%	69.2%	69.8%	0.858
Acute myocardial infarction	5%	6.4%	4.7%	0.217
Cardiac Arrest & Ventricular Fibrillation	5.6%	5.4%	5.6%	0.888
Stroke and Transient Ischemic Attack	1.9%	2.4%	1.8%	0.982
Peripheral Artery Disease	7%	6.3%	7.1%	0.658
Acute Kidney Injury	13%	14.5%	12.6%	0.377
Lipid disorder	57.5%	60.5%	56.8%	0.256
Syncope	2.9%	2.6%	3%	0.692
Implantable Cardioverter Defibrillator	55%	59.6%	54%	0.086
Electrolyte abnormality	19.1%	18.4%	19.3%	0.769
Valve disorder	12.7%	15.8%	12.1%	0.101
Endocarditis/myocarditis/pericarditis	20.7%	17.8%	21.4%	0.188
Coagulation disorder	6.6%	6.9%	6.6%	0.883
Pulmonary heart disease	5.5%	6.5%	5.2%	0.437
Respiratory failure	11.1%	10.2%	11.3%	0.637
Obesity	16.6%	17.2%	16.5%	0.786
Anemia	12.7%	18.6%	12.7%	0.010

Table 4: Etiology of readmission.

Etiology of Readmission	Percentage of patients readmitted
Ventricular Tachycardia	46.7
Repeat Ablation in patients with VT readmission	17.5
Congestive Heart Failure	16.6
Others	13.1
Infection	7.4
Other cardiac	6.3
Complication of device/procedure	5.3
Renal etiologies	2.2
Gastrointestinal system	2
Respiratory	0.4

Table 5: Predictors of readmission.

Variable	Univariate			Multivariate		
	p value	Odds ratio	95% CI (LL-UL)	p value	Odds ratio	95% CI (LL-UL)
Age (years)						
18-34	0.186	3.600	0.584-16.031			
35-49	0.095	0.590	0.317-1.097			
50-64	0.232	0.843	0.637-1.116			
65-79	0.001	1.563	1.203-2.030	0.136	1.243	0.934-1.653
>79	0.010	0.492	0.288- 0.842	0.042	0.550	0.309-0.979
Male	0.068	0.700	0.476-1.027			

Co-morbidities						
Diabetes Mellitus	0.004	1.471	1.129-1.916	0.031	1.348	1.028-1.769
Chronic Kidney Disease	0.001	1.654	1.225-2.235	0.039	1.395	1.018-1.914
Congestive Heart Failure	<0.001	1.945	1.465-2.582	<0.001	1.738	1.300-2.324
Chronic Obstructive Pulmonary Disease	0.001	1.728	1.256-2.378	0.006	1.583	1.138-2.201
Anemia	0.010	1.569	1.115-2.207			
Thyroid	0.352	1.189	0.826-1.713			
Hypertension	0.833	0.970	0.734-1.283			
Acute Myocardial Infarction	0.233	1.400	0.815-2.405			
Cardiac Arrest & Ventricular Fibrillation	0.921	0.972	0.552-1.712			
Transient Ischemic Attack & Stroke	0.860	1.088	0.425-2.787			
Peripheral Artery Disease	0.620	1.165	0.518-1.481			
Acute Kidney Injury	0.384	1.178	0.814-1.705			
Lipid disorder	0.254	1.165	0.896-1.516			
Syncope	0.734	0.870	0.390-1.943			
Implantable Cardioverter Defibrillator	0.086	1.258	0.968-1.635			
Electrolyte abnormality	0.741	0.946	0.679-1.317			
Valve disorder	0.093	1.362	0.949-1.954			
Endocarditis/myocarditis/pericarditis	0.183	0.798	0.572-1.113			
Coagulation disorder	0.836	1.055	0.663-1.758			
Pulmonary heart disease	0.396	1.260	0.740-2.145			
Respiratory failure	0.682	0.888	0.582-1.355			
Obesity	0.746	1.058	0.751-1.490			
Elective admission	0.067	0.810	0.646-1.015			
Discharge to facility	0.013	1.744	1.127-2.699	0.221	1.330	0.843-2.099

CHF, DM, CKD and COPD are observed to be predictors of readmission in our data. Most of the patients with ischemic VT have low ejection fraction and hence are predisposed to CHF, the 30-day readmission for which was high in our cohort. Similarly, DM and CKD are known to be independent predictors for CAD and predispose to other comorbidities such as infections or cardiovascular complications.

In addition, patients with COPD have limited cardiopulmonary reserve and can decompensate quickly in response to hypoxia, which may predispose to readmission. Whether hypoxia happens as cause or effect of VT is very difficult to determine. These mechanisms may underlie the higher rates of rehospitalizations in patients with frequent comorbidities, High short-term mortality (3.3%) is observed during the index hospitalization, which agrees with previous reports of 3% (17, Tanner et al). This may be a direct complication of the procedure itself or a consequence of the procedure in very sick patients with poor cardiovascular reserve. Elderly patients (>79 years) were less likely to be readmitted to the hospital after the index VT ablation, which likely represents a more conservative management strategy adopted in these older patients.

One of the limitations of the study is that administrative database is prone to coding errors. In addition, there is no specific ICD-9-CM code for ischemic VT ablation. We therefore had to exclude any patient with a secondary diagnosis of other arrhythmias. This may have led to an underestimation of the total number of ischemic VT ablation patients. Also, while we understand that the success of VT ablation may depend on a lot of factors including institutional experience and operator volume, which is not provided in the NRD dataset, our present analysis provides a real-world assessment of outcomes after ischemic VT ablation at the national level.

REFERENCES

1. Horwitz LI, Partovian C, Lin Z, Grady JN, Herrin J, Conover M et al. Development and use of an administrative claims measure for profiling hospital-wide performance on 30-day unplanned readmission. Ann Intern Med 2014; 161: S66-S75.

2. Arora S, Patel P, Lahewala S, Patel N, Patel NJ, Thakore K et al. Etiologies, Trends, and predictors of 30-Day readmission in patients with Heart Failure. Am J Cardiol 2017; 119:760-9.

3. Priori SG, Blomstrom-Lundgvist C, Mazzanti A, Blom N, Borggrefe M, Camm J et al. 2015 ESC guidelines for the management of patients with ventricular arrhythmias and prevention of sudden cardiac death: The Task force for the management of patients with ventricular arrhythmia and the prevention of sudden cardiac death of the European society of cardiology (ESC). Eur Heart J 2015; 36:2793-867.

4. Health Cost and Utilization Project. NRD description of data elements; NRD_DaysToEvent - Days from "start date" to admission: available at:
http://www.hcup-us.ahrq.gov/db/vars/nrd_daystoevent/nrdnote.jsp

5. Moss AJ, Zareba W, Hall WJ, Klein H, Wilber DJ, Cannom DS et al. Prophylactic implantation of defibrillator in patients with myocardial infarction and reduced ejection fraction. N Engl J Med 2002; 346:877-83.

6. Buxton A, Lee K, DiCarlo L, Gold M, Greer G, Prystowsky E et al. Electrophysiologic testing to identify patients with coronary artery disease who are at increased risk for sudden death. N Engl J Med; 342:1937-45.

7. Connolly SJ, Dorian P, Roberts RS, Gent M, Bailin S, Fain ES et al. Comparison of beta-blockers, Amiodarone plus beta-blocker, or sotalol for prevention of shocks from implantable cardioverter defibrillators: The OPTIC study: A randomized trial. JAMA 2006; 295:165-71.

8. Scron EB, Exner DV, Yao Q, Jenkins LS, Steinberg JS, Cook JR et al. Quality of life in the antiarrhythmics versus implantable defibrillator trial: Impact of therapy and influence of adverse symptoms and defibrillators shocks. Circulation 2002;105: 589-94.
9. Carroll DL, Hamilton GA. Long-term effects of implantable cardioverter defibrillators on health status, quality of life and psychological state. Am J Crit Care 2008: 17:222-30.
10. Kamphius HC, De Leeuw JW, Derksen R, Hauer RN, Winnubst JA. Implantable cardioverter defibrillator recipient. Quality of life in recipients with and without ICD shock delivery: a prospective study. Europace 2003; 5: 381-9.
11. Poole JE, Johnson GW, Hellkamp AS, Anderson J, Callans DJ, Raitt MH et al. Prognostic importance of defibrillator shocks in patients with heart failure. N Engl J Med 2008; 359:1009-17.
12. Moss AJ, Greenberg H, Case RB, Zareba W, Hall WJ, Brown MV et al. Long-term clinical course of patients after termination of ventricular tachyarrhythmia by an implanted defibrillator. Circulation 2004; 110:3760-3765.
13. Marchlinski FE, Callans DJ, Gottlieb CD, Zado E. Linear ablation lesions for control of unmappable ventricular tachycardia in patients with ischemic and non-ischemic cardiomyopathy. Circulation 2000; 101:1288-96.
14. Soejima K, Suzuki M, Maisel WH, Brunchkhorst CB, Delacretaz E, Blier L et al. Catheter ablation in patients with multiple and unstable ventricular tachycardia after myocardial infarction: short ablation lines guided by reentry circuit isthmuses and sinus rhythm mapping. Circulation 2001; 104:664-9.
15. Reddy VY, Neuzil P, Taborsky M, Rsukin JN. Short-term results of substrate mapping and radiofrequency ablation of ischemic ventricular tachycardia using a saline irrigate catheter. J Am Coll Cardiol 2003; 41:2228-36.
16. Kuch KH, Schaumann A, Eckardt L, Willems S, Ventura R, Delacretaz E et al. Catheter ablation of stable ventricular tachycardia before defibrillator implantation in patients with coronary heart disease (VTACH): a multicenter randomized controlled trial VTACH study group. Lancet 2010; 375:31-40.
17. Tanner H, Hindricks G, Volkmer M, Furniss S, Kuhlkamp V, Lacroix D et al. Catheter ablation of recurrent scar-related ventricular tachycardia using electroanatomical mapping and irrigated ablation technology: results of the prospective multicenter Euro-VT-study. J Cardiovasc Electrophysiol 2010; 21:47-53.
18. Stevenson WG, Wilber DJ, Natale A, Jackman WM, Marchlinski FE, Talbert T et al. Multicentric trial of irrigated radiofrequency catheter ablation guided by electroanatomic mapping for ventricular tachycardia after myocardial infarction. Circulation 2008; 118:2773-82.
19. Kosmidou I, Inada K, Seiler J, Koplan B, Stevenson WG, Tedrow UB. Role of repeat procedures for catheter ablation of postinfarction ventricular tachycardia. Heart Rhythm 2011; 8: 1516-22.

Source of Support: Nil.

Conflict of Interest: None Declared.

Cite this article as: Rohit Rattan, Vikas Singh, Prabhjot Bedi, Karandeep Bumrah, Ramanjeet Singh, Ashish Sharma. Causes and Predictors of Hospital Readmissions After Ischemic Ventricular Tachycardia Ablation. Int J Med Res Prof. 2020 May; 6(3): 29-34. DOI:10.21276/ijmrp.2020.6.3.007