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Journal Pre-proof

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PII: S0190-9622(20)32680-3

DOI: <https://doi.org/10.1016/j.jaad.2020.09.079>

Reference: YMJD 15280

To appear in: *Journal of the American Academy of Dermatology*

Received Date: 29 April 2020

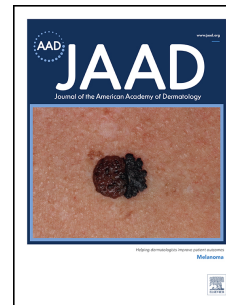
Revised Date: 21 September 2020

Accepted Date: 29 September 2020

Please cite this article as: Ramos-Rodriguez AJ, Cancel-Artau KJ, Lemor A, Carrasquillo OY, Lozano-Franco M, Santiago-Vazquez M, Barrera-Llaurador J, Martin-Garcia RF, The in-hospital burden of dermatomyositis on patients with acute myocardial infarction: A nationwide cross-sectional analysis from 2004 to 2015., *Journal of the American Academy of Dermatology* (2020), doi: <https://doi.org/10.1016/j.jaad.2020.09.079>.

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Research Letter

The in-hospital burden of dermatomyositis on patients with acute myocardial infarction: A nationwide cross-sectional analysis from 2004 to 2015.

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Funding sources: None

Conflicts of interest: None declared

IRB Approval: Exempt

Reprint requests: Alvaro J. Ramos-Rodriguez, MD

Manuscript word count: 500

References: 5

Figures: None

Tables: 2

1 The prevalence of cardiac involvement in patients with dermatomyositis (DM) ranges from 9%
2 to 72%, mainly attributed to accelerated atherosclerosis, increased incidence of cardiovascular
3 risk factors, and side effects of commonly used therapies.¹⁻³ Cardiovascular involvement
4 accounts for 20% of DM hospitalizations and is the most common cause of death.³⁻⁵ Given the
5 significant association of DM with cardiovascular disease, we explored the medical impact of
6 patients with DM admitted to the hospital for an acute myocardial infarction (AMI). In addition,
7 we compared demographic characteristics and comorbidities present in DM patients admitted
8 with AMI.

9 We conducted a retrospective cross-sectional study using the National Inpatient Sample (NIS)
10 from 2004 to 2015. All admissions across the U.S. from 2004 to 2015 with a principal diagnosis
11 of AMI (ICD-9-CM:410.0-410.9) were included. Admissions after 2015 were not included as the
12 NIS database transitioned from ICD-9 to ICD-10 coding. Admissions for AMI were divided into
13 two cohorts based on the presence or absence of *Dermatomyositis* using the ICD-9-CM-code
14 710.3. The statistical analysis was performed with STATA-14 by evaluating univariate
15 differences in baseline characteristics between our cohorts using Pearson chi-square tests for
16 categorical variables and Wilcoxon rank-sum tests for continuous variables. Multivariate linear
17 and logistic regression were used to compare hospital outcomes between groups, adjusting for
18 potential confounders.

19
20 A total of 7,440,225 admissions with AMI were recorded, of which 863 had a concomitant
21 diagnosis of DM. During hospitalization, patients with AMI-DM were significantly more likely
22 to die (OR=3.0, 95% CI 1.8–4.9, $P<0.01$), experience a cardiac arrest (OR=2.7, 95% CI 1.5–5.1,
23 $P<0.01$), undergo coronary artery bypass graft surgery (OR=1.9, 95% CI 1.2–3.0, $P=0.01$), and
24 require an intra-aortic balloon pump (OR=2.3, 95% CI 1.3–4.1, $P<0.01$) (Table I). Among the

25 baseline demographics, both cohorts had similar mean age (66.7 and 67.5 years) and more than
26 75% were white. Those in the AMI-DM group were more likely to be female (56.5% vs. 39.6%),
27 and African-American (11.7% vs. 9.9%) or Hispanic (7.7% vs. 7.4%). Patients with AMI-DM
28 were significantly more likely to have type-2 diabetes mellitus (43.6% vs. 34.3%, $P<0.01$) (Table
29 II).

30

31 In our study, patients in the AMI-DM cohort were approximately three times more likely to
32 experience a cardiac arrest and die during the hospital admission. These findings suggest that
33 patients with DM who experience a myocardial infarction may have a worse prognosis compared
34 to those without DM. Additionally, the use of intra-aortic balloon pump was more than twice as
35 frequent among the AMI-DM subgroup suggesting a more challenging hospital course with
36 severe complications. Finally, patients with DM had a higher prevalence of type-2 diabetes,
37 which may partly account for the higher number coronary artery bypass graft surgery among DM
38 patients. Limitations of this study include the cross-sectional nature and inherent inability to
39 assess temporal relationships and other variables such as medical treatment, compliance, and
40 disease severity.

41 Patients with DM might present with increased cardiovascular risk factors, complications and
42 mortality. Dermatologists caring for patients with DM may consider performing a thorough
43 cardiovascular risk factor assessment during outpatient visits and referring high-risk patients to
44 the cardiologist. Aggressive cardiovascular risk reduction strategies could decrease morbidity
45 and mortality in this patient population.

Table I: In-hospital Medical Burden of DM on Patients With AMI

In-hospital Outcomes	AMI Without DM	AMI With DM	Odds Ratio (95% CI)	P Value
Procedural outcomes				
Percutaneous coronary intervention	42.9%	32.1%	0.6 (0.38-0.85)	< 0.01
Coronary artery bypass graft	8.9%	13.8%	1.9 (1.2-3.0)	0.01
Intra-aortic balloon pump	4.8%	8.9%	2.3 (1.3-4.1)	< 0.01
Percutaneous ventricular assist device	0.2%	0.6%	3.3 (0.5-23.8)	0.24
Clinical outcomes				
Mortality (died during admission)	5.7%	11.7%	3.0 (1.8-4.9)	< 0.01
Acute respiratory failure	7.6%	10.5%	1.4 (0.8-2.5)	0.22
Major bleeding	3.3%	3.2%	1.3 (0.6-2.9)	0.56
Acute kidney injury (AKI)	12.6%	14.5%	1.4 (0.9-2.3)	0.15
AKI requiring dialysis	0.8%	1.1%	1.5 (0.4-6.2)	0.55
Stroke	1.8%	3.4%	1.6 (0.6-4.3)	0.37
Cardiac arrest	3.0%	7.0%	2.7 (1.5-5.1)	< 0.01

Abbreviations: AMI, acute myocardial infarction; DM, dermatomyositis

Table II. Baseline Demographics and Comorbidities of AMI Patients With and Without DM from 2004 to 2015

Baseline Demographics	AMI without DM	AMI-DM	P Value
Number of patients	7,439,362	863	
Age (mean)	67.5±14.4	66.7±12.9	
Gender			
Male	60.4%	43.4%	
Female	39.6%	56.6%	
Race			
White	76.7%	76.3%	
African-American	9.9%	11.7%	
Hispanic	7.4%	7.7%	
Asian	2.2%	0.6%	
Other	3.8%	3.7%	
Comorbidities			
Hypertension	66.8%	69.2%	0.53
Dyslipidemia	54.9%	50.4%	0.25
Prior myocardial infarction	10.4%	11.1%	0.77
Prior percutaneous coronary intervention	11.7%	12.8%	0.68
Prior coronary artery bypass graft	7.5%	6.1%	0.46
Prior AICD	1.2%	0.6%	0.47
Atrial fibrillation	16.6%	17.4%	0.78
Chronic obstructive pulmonary disease	16.4%	14.0%	0.38
End stage renal disease	2.8%	3.4%	0.61
Obese	11.9%	12.1%	0.95
Carotid artery disease	1.8%	2.4%	0.55
Prior stroke/transient ischemic attack	6.0%	4.4%	0.36
Type 2 diabetes mellitus	34.3%	43.6%	< 0.01
Type 1 diabetes mellitus	4.5%	6.4%	0.24
Heart failure	0.9%	1.7%	0.69
Tobacco use	34.8%	24.0%	< 0.01
Known coronary artery disease	75.6%	74.4%	0.73
Drug abuse	2.1%	2.3%	0.84
Charlson Comorbidity Index (CCI)			< 0.01
0	16.7%	22.2%	
1	33.4%	21.3%	
2	27.8%	34.5%	
≥ 3	22.1%	22.0%	

Abbreviations: AMI, acute myocardial infarction; AICD, automated implantable cardioverter defibrillator; DM, dermatomyositis

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