Utility of Cardiac MR Imaging in Myocarditis: Analysis of National Inpatient Sample Data

Background: Over the last few decades, Cardiac magnetic resonance (CMR) imaging has emerged as an important non-invasive diagnostic tool for evaluation of myocarditis.[1] It allows detection of inflammatory hyperemia, edema and myocyte necrosis.[2] We intend to use National Inpatient Sample (NIS) database to explore variability and predictors of the use of CMR in patients admitted with myocarditis.

Methods: We inquired the NIS database from years 2006 – 2016, to identify through ICD-9 and ICD-10 codes, all patients > 18 years of age with a primary diagnosis of acute myocarditis (AM) and acute myopericarditis (AMP) who underwent cardiac magnetic resonance imaging.

Results: Between 2006 and 2016, an estimated 141,982 hospitalizations had a primary discharge diagnosis of AM (*n* = 15,283 [10.8%]) or AMP (*n* = 126,699 [89.2%]). Within these hospitalizations, only 276 (0.2%) hospitalizations included cardiac MRI (*n* = 143 [0.9%] within AM; *n* = 133 [0.1%] within AMP), of which 100 (36.0%) had cardiac MRI listed as the primary procedure. The table provided below presents the percentage of the total hospitalization cohort accounted for by each category or variable (denominator = 141,982). It also provides the rate of cardiac MRI within each category or variable (denominator = number of hospitalizations with a given category or variable).

Conclusion: Despite CMR imaging being recommended in ACC 2013 heart failure guidelines, the overall utility has been remained very nominal during hospitalization in our study. CMR offers a unique combination of safety, clarity of anatomical visualization, inter-observer consistency and quantitative accuracy.[2] We encouraged the use of this versatile diagnostic technique for myocarditis.

Patient and Facility Demographics

	Percent of Total Cohort (*N* = 141,982)	Rate of CMR (%)
Age		
18-24	9.3	0.5
25-34	12.8	0.3
35-44	13.3	0.3
45-54	18.2	0.1
55-64	18.8	0.1
65-74	14.3	0.1
75-84	9.8	0.1
85+	3.4	0.0
Biological Sex		
Female	39.9	0.2
Male	60.1	0.2
Race		
White	67.8	0.2
Black	16.8	0.2
Hispanic	9.5	0.4
Other	5.9	0.5
Hospital Type		
Rural	8.1	0.1
Urban Non-Teaching	37.5	0.0
Urban Teaching	54.3	0.3

References:

1. Saeed M, Van TA, Krug R, Hetts SW, Wilson MW. Cardiac MR imaging: current status and future direction. Cardiovasc Diagn Ther. 2015;5(4):290–310

2. Friedrich MG, Sechtem U, Schulz-Menger J, et al. Cardiovascular magnetic resonance in myocarditis: A JACC White Paper. J Am Coll Cardiol. 2009;53(17)

Authors:
Dixitha Anugula[1]
Raviteja Guddeti[1]
Kashif Shaikh[1]
Geetanjali Dang[1]
Arun Reddy Kanmanthareddy[1]
Venkata Mahesh Alla[1]

Affiliations:
[1]Creighton University Bergan Mercy Medical Center