



Letter to the Editor

Epidemiology of Takotsubo syndrome associated with Kounis syndrome in the United States

Rupak Desai^{a,*}, Sandeep Singh^b, Nicholas G. Kounis^c, Rajesh Sachdeva^{a,d,e,f}, Gautam Kumar^{a,f}^a Division of Cardiology, Atlanta Veterans Affairs Medical Center, Decatur, GA, USA^b Department of Clinical Epidemiology, Biostatistics and Bioinformatics, Amsterdam University Medical Centre, Location AMC, Amsterdam, the Netherlands^c Department of Cardiology, Patras University School of Medicine, Patras, Greece^d Division of Cardiology, Morehouse School of Medicine, Atlanta, GA, USA^e Division of Cardiology, Medical College of Georgia, Augusta, GA, USA^f Division of Cardiology, Emory University School of Medicine, Atlanta, GA, USA

ARTICLE INFO

Article history:

Received 11 January 2020

Accepted 27 January 2020

To the Editor,

Kounis syndrome (KS) is an acute coronary syndrome involving immune system activation [1]. Anaphylaxis leads to compensatory catecholamine release from adrenal medullary cells [2]. Epinephrine administration in anaphylaxis further raises plasma catecholamine perpetuating the vicious cycle. Conversely, Takotsubo syndrome (TTS) is stress-induced catecholamine surge leading to transient myocardial stunning. Hypercatecholaminemia and inflammatory mediators in allergic/anaphylactic reactions could cause coronary vasospasm and myocardial stunning leading to TTS [3].

KS and TTS are frequently diagnosed clinical entities, but large-scale data on their epidemiology and outcomes remain non-existent. Using the National Inpatient Sample (2007–2014), we identified KS and TTS (ICD-9 CM code 429.83)-related adult hospitalizations and assessed frequency of KS-associated TTS [4]. Baseline characteristics and hospital outcomes were analyzed. The burden of TTS was 1.5% ($n = 39$) of all KS-related hospitalizations ($n = 2616$). The KS-TTS cohort consisted often elderly (74[12] vs 66[14] yrs) female (100% vs 52.9%) and less often white (62.2% vs 71.3%) patients ($p < 0.001$) compared to non-TTS cohort [5]. Cardiovascular comorbidities and risk factors were prevalent in the KS-TTS compared to the non-KS-TTS cohort including hypertension (100% vs 75.6%; $p < 0.001$) and dyslipidemia (62.4% vs

44.7%; $p = 0.03$). There was higher cost to health care in KS-TTS cohort, less routine discharge (49.5% vs 65.2%), more transfer to other facilities (37.6% vs 16.8%) ($p = 0.004$). Both cohorts had comparable hospitalization cost.

This first-ever population-based analysis on the subject demonstrates that the frequency of TTS was 1.5% among all KS-related admissions. The KS-TTS cohort mainly included white female patients with a higher burden of cardiovascular risk factors and resource utilization compared to non-TTS cohort.

Funding source

None.

Declaration of competing interest

None.

References

- [1] N.G. Kounis, Kounis syndrome: an update on epidemiology, pathogenesis, diagnosis and therapeutic management, *Clin. Chem. Lab. Med.* 54 (2016) 1545–1559, <https://doi.org/10.1515/cclm-2016-00102>.
- [2] N.G. Kounis, Attack the ATAK: “ὅς θεός συνέχευε, ἄνθρωπος μὴ χωρίζτω” (Ous O Theos Synezeuxe Anthropos Me Horizeto) “What therefore god hath joined together, let not man put asunder”, *Int. J. Cardiol.* 203 (2016) 960–961.
- [3] M.H. Mustehsan, F. Jahufar, S. Arora, A diagnostically challenging infusion reaction—Kounis, Takotsubo, or the ATAK! *JAMA Intern. Med.* 179 (2019) 99–100, <https://doi.org/10.1001/jamainternmed.2018.6155>.
- [4] R. Desai, T. Parekh, U. Patel, et al., Epidemiology of acute coronary syndrome co-existent with allergic/hypersensitivity/anaphylactic reactions (Kounis syndrome) in the United States: a nationwide inpatient analysis, *Int. J. Cardiol.* 292 (2019) 35–38, <https://doi.org/10.1016/j.ijcard.2019.06.002>.
- [5] A. Dias, E. Franco, N. Koshkelashvili, G.S. Pressman, K. Hebert, V.M. Figueredo, Racial and ethnic differences in Takotsubo cardiomyopathy presentation and outcomes, *Int. J. Cardiol.* 194 (2015) 100–103, <https://doi.org/10.1016/j.ijcard.2015.04.056>.

* Corresponding author at: Division of Cardiology, Atlanta Veterans Affairs Medical Center, 1670 Clairmont Rd, Decatur, GA 30033, USA.

E-mail address: drupakdesai@gmail.com (R. Desai).