Primary versus Secondary type of Takotsubo syndrome

Karolína Bartošková, Petr Toušek

3. Lékařská fakulta UK

Fakultní nemocnice Královské Vinohrady

Hypothesis:

Takotsubo syndrome (TTS) often develop subsequently after initial hospitalization for serious non-cardiac disease. The incidence of such „secondary“ TTS is rising due to closer interdisciplinary cooperation.

The aim of the study is to compare patients in those TTS was the primary reason for admission with patients with secondary TTS.

Takotsubo syndrome (TTS) is the primary reason for admission

At the beginning patient mimics ACS and/or has signs of heart failure

- Symptoms: acute cardiac symptoms - pain, shortness of breath
- ECG: acute ischemic changes
- Hemodynamic instability

TTS develops after initial hospitalization for serious non-cardiac disease

- hemodynamic instability of unexplained etiology appears during hospitalization
- new changes on ECG
- new cardiac symptoms

Sample and methodology

Prospective monocentric study

Single center Register of TTS patients

A total of **155 patients were diagnosed with TTS** during 2013 and 2023

All of them had to meet the international InterTAK diagnostic criteria.

Cardiac catheterization - all patients

- in the case of coexistence of coronary arterial disease, the regional kinetics disorder could not correspond to the territory of the coronary arteries

Inter-TAK diagnostic criteria: (Ghadri et all, JACC 2018)

1) Transient left ventricular dysfunction presenting as either apical, midventricular, basal or focal wall motion abnormalities with possible right ventricular involvement

2) A preceding emotional, physical, or combined trigger (although not obligatory)

3) Neurological disorders as well as pheochromocytoma may serve as possible triggers

4) Presence of new ECG abnormalities (ST-segment elevation or depression, T-wave inversion, or QTc prolongation)

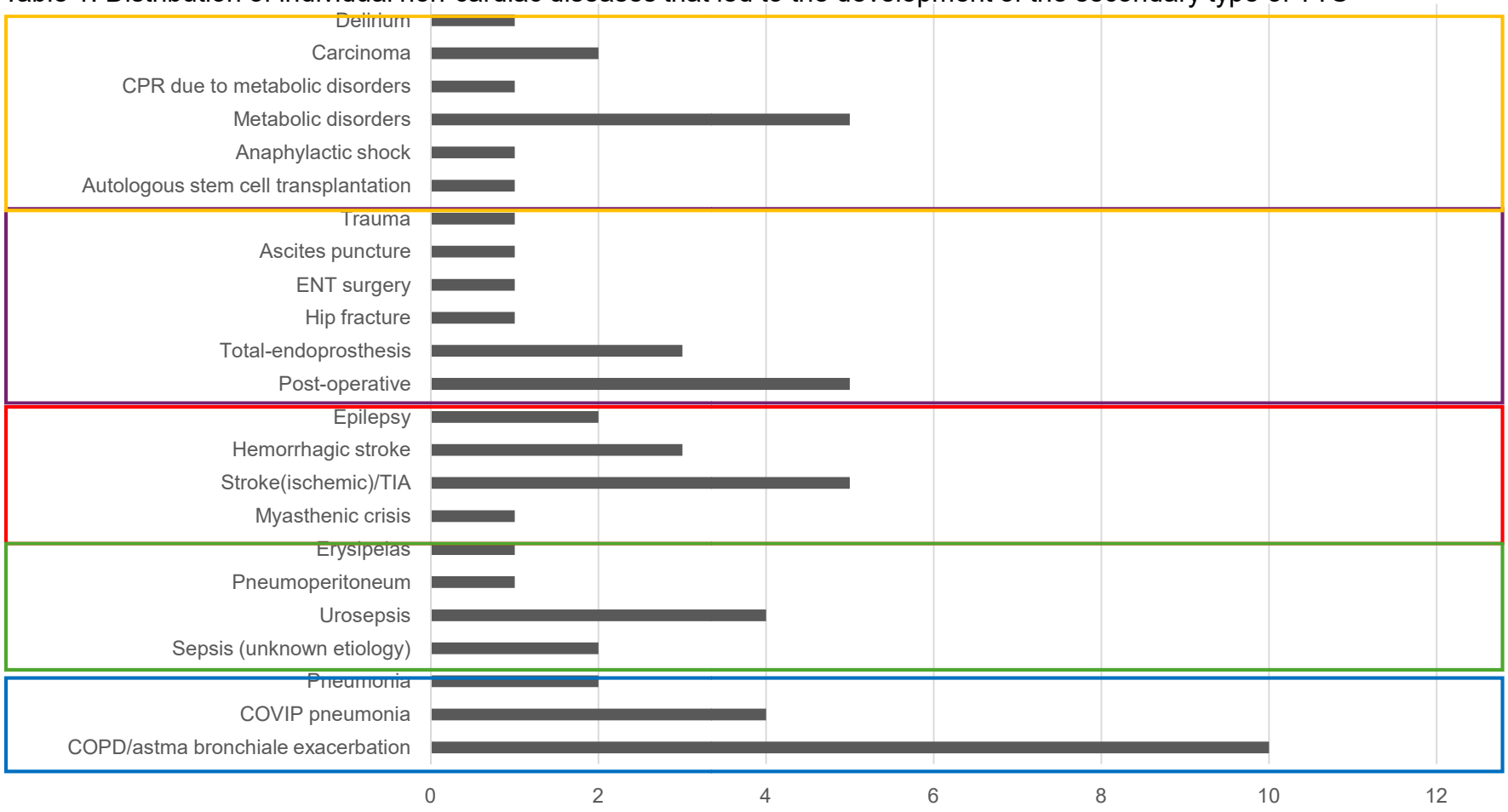
5) Levels of cardiac biomarkers (troponin and creatine kinase) are moderately elevated in most cases; significant elevation of brain natriuretic peptide is common

6) Significant coronary artery disease can coexist

7) Absence of infectious myocarditis

- ***Group A (primary TTS)*** included patients who were admitted with primarily acute cardiac involvement and the suspicion of TTS which we definitively concluded as TTS – **97 patients**
- ***Group B (secondary TTS)*** included patients admitted for non-cardiac severe disability, who were diagnosed with TTS based on new onset of symptoms after initial hospitalization – **58 patients**

Table 1. Distribution of individual non-cardiac diseases that led to the development of the secondary type of TTS



Results

ble 2. Comparison of basic characteristic of
th group, clinical manifestation and outcomes

Table 2	Group A	Group B	p value
	Primary TTS N=97	Secondary TTS N=58	
Female	89	53	0.935
	91.7	91.4	
Age,y	71.4 ± 9.4	70.7 ± 8.7	0.681
BMI, kg/m2	25.9 ± 3.3	25.4 ± 4.2	0.524
Dyspnea	55	32	0.853
	56.7%	55.2%	
Chest pain	67	15	0.000
	69.1%	25.9%	
TTS type			
Apical	74	33	0.012
	76.3%	56.9%	
Basal	2	2	0.598
	2.1%	3.4%	
Midvenrticular	15	22	0.001
	5.4%	37.9%	
Focal	6	1	0.196
	6.2%	1.7%	
Ejection fraction, %	36.1 ± 7.6	34.7 ± 6.5	0.342
Coexsitence of CAD	14	17	0.025
	14.4%	29.3%	
Cardiogenic shock	6	16	0.001
	6.2%	27.6%	
In-hospital death	6	9	0.057
	6.2%	15.5%	
The time from admission to diagnosis of TTS, days	0.7 ± 0.9	5.3 ± 5.4	0.0001

Outcomes

- More than one third of patients from our registry had secondary type of TTS induced by another primary non-cardiac disease.
- Primary and secondary type of TSS did not differ in sex, age and ejection fraction.
- Secondary type of TSS was associated with worse prognosis.
- A diagnosis of takotsubo syndrome should always be considered in patients initially admitted for primarily non-cardiac disease who develop unexplained deterioration during hospitalization, especially those with a typical TTS trigger such as an exacerbation of COPD or after stroke.