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KEY TAKOTSUBO DATA VARIABLES

- 80-90% of Takotsubo patients are women¹⁻³. The syndrome occurs predominantly in postmenopausal women.
- Takotsubo's presentation mimics acute myocardial infarction with symptoms, electrocardiographic (ECG) changes and elevated cardiac biomarkers that are often undistinguishable from those caused by coronary artery stenosis.
- The typical echocardiographic or angiographic ventriculogram feature of Takotsubo syndrome is a wall-motion abnormality (WMA) of the apex, with preserved basal segment function (apical ballooning syndrome) (82% of patients present with typical form)¹.
- In most Takotsubo patients, coronary angiograms show no obstructive stenosis^{1,3,4}. However, about 12-15% of Takotsubo patients have concomitant obstructive coronary artery disease (luminal stenosis >50%)^{1,3,4}, although the characteristic WMA does not match the stenosis.
- WMA usually improves spontaneously over a short period of time, approximately 1 to 2 weeks. Even so, between 1-5% of Takotsubo patients die during the initial hospital stay, usually of cardiac arrhythmia^{1,2,4-9}.
- Although men represent approximately 10% of patients diagnosed with Takotsubo, they have worse short- and long-term outcomes when compared to women (in-hospital death of 7.3% vs 3.8%, p=0.025; 30-day

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death 12.2% vs 5.2%, $p=0.001$; 10-year death 12.9% per patient-year vs 5% per patient-year, $p<0.001$, respectively)¹.

- A Takotsubo recurrence rate of approximately 5-10% within 4-5 years is reported, but recurrent episodes can be seen as early as 3 months, and as late as 9.2 years after the initial event^{1,10,11}. A substantial portion of Takotsubo patients (20-30%) continue to have episodes of chest pain and dynamic ECG changes^{1,6,12,13} on follow-up.
- Studies have suggested that between 1.7-2.5% of patients presenting with suspected acute coronary syndrome are eventually diagnosed with Takotsubo¹⁴⁻¹⁸.
- From the NIH-USA, Takotsubo syndrome was diagnosed in 0.02% of all acute hospitalizations in the USA in 2008 (6837/33,506,402 patients)¹⁹. Overall frequency of Takotsubo syndrome was calculated to be 5.2 per 100,000 for women and 0.6 per 100,000 for men. These numbers imply that there are ~50,000–100,000 cases per annum in the USA, with similar estimated numbers in Europe¹³. Nationwide trends in incidence of Takotsubo syndrome were also reported from the NIS database²⁰ showing a 19-fold increase in incidence rate in 2012, as compared to 2006. The diagnosis was shown to be most frequent in the subjects aged 65 to 84 years (47-55% of cases), followed by those aged 45 to 64 years (32-44% of cases)²⁰. With the increased awareness of Takotsubo syndrome, this number continues to rise, suggesting that the real incidence and prevalence of Takotsubo syndrome is not well established.

References

1. Templin C, Ghadri JR, Diekmann J et al. Clinical Features and Outcomes of Takotsubo (Stress) Cardiomyopathy. *The New England journal of medicine*. 2015;373:929-38. <https://www.nejm.org/doi/full/10.1056/NEJMoa1406761>
2. Schneider B, Athanasiadis A, Schwab J et al. [Clinical spectrum of tako-tsubo cardiomyopathy in Germany: results of the tako-tsubo registry of the Arbeitsgemeinschaft Leitende Kardiologische Krankenhausärzte (ALKK)]. *Deutsche medizinische Wochenschrift (1946)*. 2010;135:1908-13. <https://www.nejm.org/doi/full/10.1056/NEJMoa1406761>
3. Redfors B, Vedad R, Angeras O et al. Mortality in takotsubo syndrome is similar to mortality in myocardial infarction - A report from the SWEDEHEART registry. *International journal of cardiology*. 2015;185:282-9. <https://www.sciencedirect.com/science/article/pii/S0167527315004015?via%3Dihub>
https://ac.els-cdn.com/S0167527315004015/1-s2.0-S0167527315004015-main.pdf?_tid=38ee12cc-2b19-41b5-a26d-0e03181d9525&acdnat=1528918425_02bc60a3bcdd8c3e438e107066ebd2e3
4. Vrzi O, Brosolo G, Martina S et al. In-hospital and long-term mortality in Takotsubo cardiomyopathy: a community hospital experience. *Journal of community hospital internal medicine perspectives*. 2016;6:31082. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4942542/pdf/JCHIMP-6-31082.pdf>
5. Regnante RA, Zuzek RW, Weinsier SB et al. Clinical characteristics and four-year outcomes of patients in the Rhode Island Takotsubo Cardiomyopathy Registry. *The American journal of cardiology*. 2009;103:1015-9. <https://www.sciencedirect.com/science/article/pii/S0002914908022157?via%3Dihub>
6. Parodi G, Bellandi B, Del Pace S et al. Natural history of tako-tsubo cardiomyopathy. *Chest*. 2011;139:887-892. <https://www.sciencedirect.com/science/article/pii/S0012369211601918?via%3Dihub>
https://ac.els-cdn.com/S0012369211601918/1-s2.0-S0012369211601918-main.pdf?_tid=6f26673e-53ed-4d70-9354-91d8c0e8e95b&acdnat=1528921559_dfd45fa458d3d5b9d2d14ef3b2b3a710
7. Prevaliti M, Repetto A, Camporotondo R et al. Clinical characteristics and outcome of left ventricular ballooning syndrome in a European population. *The American journal of cardiology*. 2011;107:120-5. [https://www.ajconline.org/article/S0002-9149\(10\)01738-8/fulltext](https://www.ajconline.org/article/S0002-9149(10)01738-8/fulltext)
8. Sharkey SW, Windenburg DC, Lesser JR et al. Natural history and expansive clinical profile of stress (tako-tsubo) cardiomyopathy. *Journal of the American College of Cardiology*. 2010;55:333-41. <https://www.sciencedirect.com/science/article/pii/S0735109709036146?via%3Dihub>
https://ac.els-cdn.com/S0735109709036146/1-s2.0-S0735109709036146-main.pdf?_tid=66fceb14-2af6-4dfe-b209-0bd3cd8c5acd&acdnat=1528922365_f665ace3e8fcad0961856853a83ac4c4
9. Brinjikji W, El-Sayed AM, Salka S. In-hospital mortality among patients with takotsubo cardiomyopathy: a study of the National Inpatient Sample 2008 to 2009. *American heart journal*. 2012;164:215-21. https://ac.els-cdn.com/S0002870312002943/1-s2.0-S0002870312002943-main.pdf?_tid=394ad86f-5141-4b98-bcad-6081c8adc325&acdnat=1529514277_48f33c9a485a6a8929ed23f3b17d16e0
10. Elesber AA, Prasad A, Lennon RJ, Wright RS, Lerman A, Rihal CS. Four-year recurrence rate and prognosis of the apical ballooning syndrome. *Journal of the American College of Cardiology*. 2007;50:448-52. <https://www.sciencedirect.com/science/article/pii/S073510970701491X?via%3Dihub>

- https://ac.els-cdn.com/S073510970701491X/1-s2.0-S073510970701491X-main.pdf?_tid=681ac22b-4681-4acc-bd34-ef6ee2f77ee4&acdnat=1528920483_36ed2396bcb1a16297366167ab5f314
11. Sharkey SW, Lesser JR, Zenovich AG et al. Acute and reversible cardiomyopathy provoked by stress in women from the United States. *Circulation*. 2005;111:472-9. <http://circ.ahajournals.org/content/circulationaha/111/4/472.full.pdf>
 12. Citro R, Bossone E, Parodi G et al. Clinical profile and in-hospital outcome of Caucasian patients with takotsubo syndrome and right ventricular involvement. *International journal of cardiology*. 2016;219:455-61. <https://www.sciencedirect.com/science/article/pii/S016752731631052X?via%3Dihub>
- https://ac.els-cdn.com/S016752731631052X/1-s2.0-S016752731631052X-main.pdf?_tid=8accd143-c05d-4af9-839c-18b5d12180f7&acdnat=1529437253_df1e4174d67c7652b52c7c0c7e96915e
13. Lyon AR, Bossone E, Schneider B et al. Current state of knowledge on Takotsubo syndrome: a Position Statement from the Taskforce on Takotsubo Syndrome of the Heart Failure Association of the European Society of Cardiology. *European journal of heart failure*. 2016;18:8-27. <http://spiral.imperial.ac.uk/bitstream/10044/1/26535/2/ESC%20HFA%20Position%20Statement%20on%20Takotsubo%20Syndrome%20REVISED%20September%202015.pdf>
 14. Akashi YJ, Nakazawa K, Sakakibara M, Miyake F, Musha H, Sasaka K. 123I-MIBG myocardial scintigraphy in patients with "takotsubo" cardiomyopathy. *Journal of nuclear medicine : official publication, Society of Nuclear Medicine*. 2004;45:1121-7. <http://jnm.snmjournals.org/content/45/7/1121.full.pdf>
 15. Bybee KA, Prasad A, Barsness GW et al. Clinical characteristics and thrombolysis in myocardial infarction frame counts in women with transient left ventricular apical ballooning syndrome. *The American journal of cardiology*. 2004;94:343-6. https://ac.els-cdn.com/S0002914904006162/1-s2.0-S0002914904006162-main.pdf?_tid=324185b3-5f1c-4331-afe6-7fe0ee7c2987&acdnat=1529513526_b0c219d846252e909ce975d2ea9f05df
 16. Isingrini E, Belzung C, Freslon JL, Machet MC, Camus V. Fluoxetine effect on aortic nitric oxide-dependent vasorelaxation in the unpredictable chronic mild stress model of depression in mice. *Psychosomatic medicine*. 2012;74:63-72. <https://www.ncbi.nlm.nih.gov/pubmed/22210237>
 17. Matsuoka K, Okubo S, Fujii E et al. Evaluation of the arrhythmogenicity of stress-induced "Takotsubo cardiomyopathy" from the time course of the 12-lead surface electrocardiogram. *The American journal of cardiology*. 2003;92:230-3. https://ac.els-cdn.com/S0002914903005472/1-s2.0-S0002914903005472-main.pdf?_tid=e03094ab-7236-458a-bcdc-00a55e256e0f&acdnat=1529513522_8291d2ee8cb2052d803945a6110365a5
 18. Eshtehardi P, Koestner SC, Adorjan P et al. Transient apical ballooning syndrome--clinical characteristics, ballooning pattern, and long-term follow-up in a Swiss population. *International journal of cardiology*. 2009;135:370-5. https://ac.els-cdn.com/S0167527308005743/1-s2.0-S0167527308005743-main.pdf?_tid=22a98e45-eb6f-4f11-b8d6-f248b9c435ea&acdnat=1529518833_07c39fcf233edf84018c29731391ec17
 19. Deshmukh A, Kumar G, Pant S, Rihal C, Murugiah K, Mehta JL. Prevalence of Takotsubo cardiomyopathy in the United States. *American heart journal*. 2012;164:66-71.e1. <https://www.sciencedirect.com/science/article/pii/S0002870312002402?via%3Dihub>
 20. Minhas AS, Hughey AB, Koliass TJ. Nationwide Trends in Reported Incidence of Takotsubo Cardiomyopathy from 2006 to 2012. *The American journal of cardiology*. 2015;116:1128-31. <https://www.sciencedirect.com/science/article/pii/S0002914915016331?via%3Dihub>

