Estimation of Lifetime Risks and Life Expectancy of Panic Disorder in Taiwan: A Population-based Cohort Study

Kai-Jie Yang[1, 2], Daniel Tzu-Li Chen[1, 2], Ikbal Andrian Malau[1,2], Ya-Chu Yang[3], Senthil Kumaran Satyanarayanan[1], Hsien-Feng Liao[1], Hui-Chih Chang [1], Jane Pei-Chen Chang [1,2,4], Ying-Ming Chiu [5]*, Kuan-Pin Su [1,2,3,6]*

1Department of Psychiatry and Mind-Body Interface Laboratory (MBI-Lab), China Medical University Hospital, Taichung, Taiwan; 2Graduate Institute of Biomedical Sciences, China Medical University, Taichung, Taiwan;
3Big Data Research Center, Tungs' Taichung MetroHarbor Hospital; 4 College of Medicine, China Medical University, Taichung, Taiwan;
5 Department of Allergy, Immunology, and Rheumatology, Tungs' Taichung MetroHarbor Hospital, Taichung, Taiwan; 6An-Nan Hospital, China Medical University, Tainan, Taiwan

ABSTRACT

Background: The sudden onset of panic disorder (PD) often appears with multiple life-threatening cardiovascular symptoms followed by high healthcare visiting rate of PD patients, which may be associated with cardiovascular diseases (CVD). No comprehensive research on cumulative incidence rate (CIR), life expectancy (LE) and loss of life expectancy (LLE) in patients with panic disorder (PD) has been conducted currently.

Method: Data was acquired from NHIRD between January 1, 1999 and December 31, 2019, to establish the study cohort. A matched control group was generated by replicating the age, sex, and calendar year of each PD case from vital statistics records. We utilize a flexible semi-parametric method to extrapolate the CIR, LE, and LLE.

Results: A total of 136,346 newly diagnosed PD cases were included, with 3883 (2.84%) recorded deaths. Among all PD patients, 40,457 (29.67%) PD patients were comorbid with CVD, and 3483 (8.6%) recorded death accordingly. During the 11-year follow-up, LLE (0.058 years) between the PD cohort and the reference group was negligible. On the other hand, individuals with PD comorbid with CVD exhibited a neglectable LLE of 0.028 years over the course of the follow-up period. Meanwhile, high survival rates were observed in both PD cohort (0.94) and PD patients with CVD (0.84). Moreover, female PD patients demonstrated a higher CIR (5.4% to 6.6%) when compared to their male counterparts (3.2% to 3.7%), with both sexes exhibiting a declining trend since 2014.

Conclusion: Frequent medical care visiting rate due to alarming cardiac symptoms in PD patients may be related to early intervention before further deterioration.

Introduction

- The primary physical clinical features of PD may share several common symptoms with cardiovascular diseases (CVDs), such as unexpected recurrent panic attacks, dizziness, chest pains, shortness of breath, and increased heart rate (Manjunatha & Ram, 2022). Therefore, public policies of prevention and early-stage intervention may be essential to patients with PD, by which more comprehensive and accurate epidemiological data should be supported.

- While previous studies have quantified the impact of PD using mortality rates (Chang et al., 2022), the understanding of the impact of PD can be more precise if the life expectancy (LE) and the loss of LE (LLE) due to the disease can be estimated.

- We hypothesized that PD patients will exhibit reduced LE when compared to healthy controls, and LLE may be further increased in PD patients comorbid with CVD.

Method

- This study aims to estimate LE and LLE of PD patients utilizing the National Health Insurance Research Database (NHIRD) in Taiwan, as well as CVD as a comorbid condition of PD.

- We stratified patients into three subgroups, including early adulthood (aged 21 to 39), middle age (aged 40 to 54) and elders (aged 55 to 84).

- The survival function, a novel method developed by Hwang et al., was used to improve the accuracy of the calculation (Hwang et al., 2017; Hwang & Wang, 1999) and the cumulative incidence rate (CIR) of PD was calculated as well.
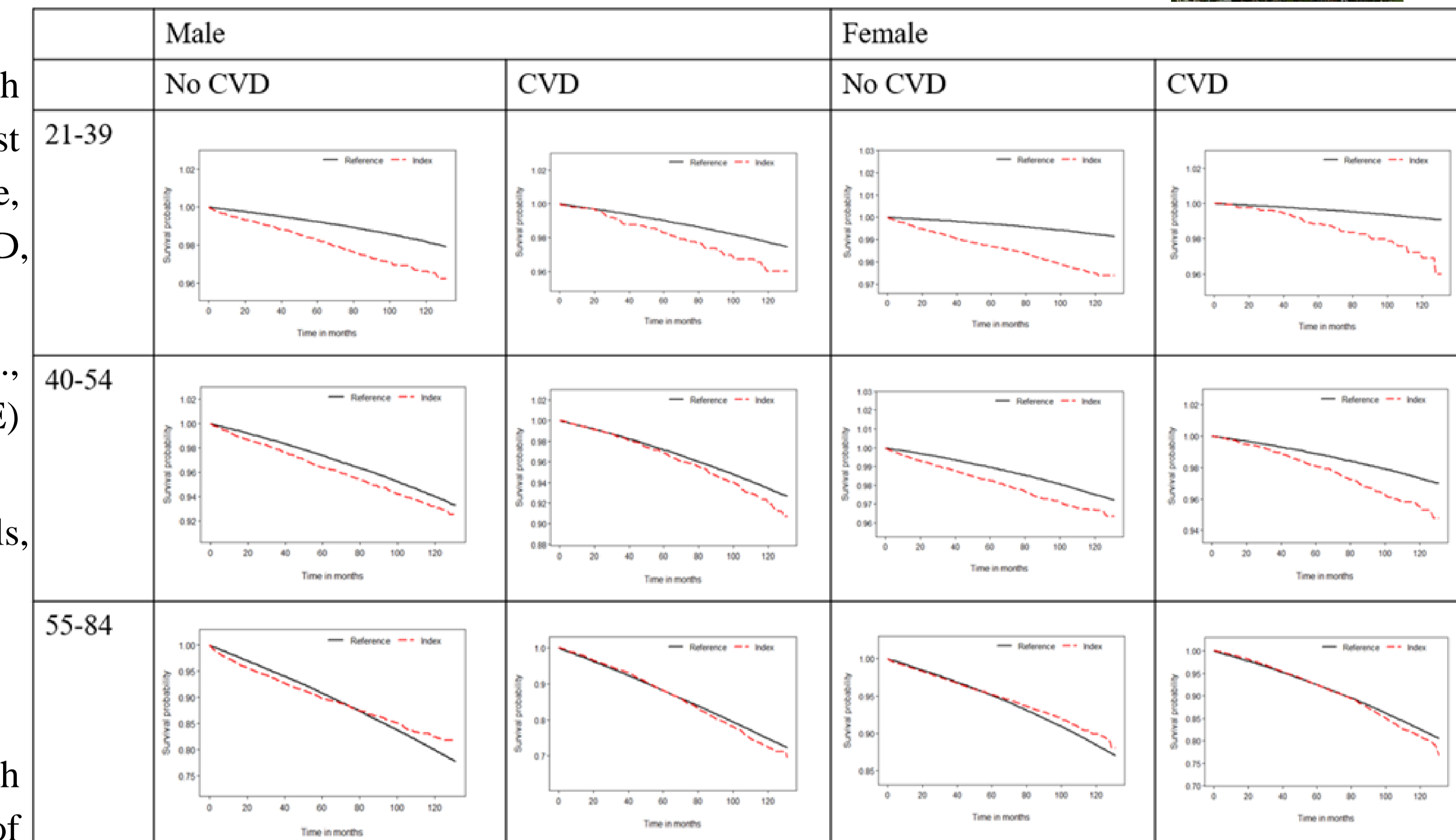
Results

Figure 1. Survival Curve of PD Patients. The graph was stratified by sex and age (in years) at diagnosis. The first row presents the age groups. The black line represents the agenda sex-matched reference group, which the data was collected from Taiwanese national life tables. The red dotted line represents the PD cohort. The area between the two lines was the loss of life expectancy.

Conclusion

- In conclusion, female patients exhibit a higher cumulative incidence rate (7.8% to 5.4%) when compared to male patients. The resemblance in survival curves between the PD cohort and the reference group precludes the estimation of LLE and lifetime healthcare costs. Nonetheless, the findings indicate that PD, despite its life-threatening symptoms, is a manageable disorder, with treated patients displaying a similar LE to that of the general population.

Table 1. Numbers of Patients Included and Characteristics.

	age	n	no. of death	age
Overall		17683	7366	47.42±14.23
Overall with CVD		40457	3483	56.79±13.21
Overall without CVD		136346	3883	44.64±13.31
Male				
No CVD	21-39	21184	378	31.51±5.43
	40-54	17945	652	46.99±4.25
	55-84	9247	815	63.17±6.79
CVD	21-39	2432	59	33.96±4.58
	40-54	6299	302	48.12±4.22
	55-84	8292	1280	65.71±7.84

Table 2. The cumulative incidence rate of panic disorder in the Taiwanese population ages 21–84 years, stratified by sex and calendar year of diagnosis.

	All	Male	Female
2009	5.2	3.7	6.6
2010	5	3.6	6.4
2011	4.8	3.5	6
2012	5.5	4	6.9
2013	5.9	4.4	7.3
2014	5.6	4.1	7
2015	6.3	4.6	7.8
2016	5.8	4.4	7.2
2017	5.4	4.2	6.6
2018	4.9	3.8	6
2019	4.3	3.2	5.4

Reference

Manjunatha, N., & Ram, D. (2022). Panic disorder in general medical practice- A narrative review. 11(3), 861-869. https://doi.org/10.4103/jfmpc.jfmpc_888_21; Chang, C. K., Hayes, R. D., Perera, G., Broadbent, M. T., Fernandes, A. C., Lee, W. E., . . . Stewart, R. (2011). Life expectancy at birth for people with serious mental illness and other major disorders from a secondary mental health care case register in London. PLOS ONE, 6(5), e19590. https://doi.org/10.1371/journal.pone.0019590 ; Hwang, J. S., Hu, T. H., Lee, L. J., & Wang, J. D. (2017). Estimating lifetime medical costs from censored claims data. Health Econ, 26(12), e332-e344. https://doi.org/10.1002/hec.3512; Hwang, J. S., & Wang, J. D. (1999). Monte Carlo estimation of extrapolation of quality-adjusted survival for follow-up studies. Stat Med, 18(13), 1627-1640. https://doi.org/10.1002/(sici)1097-0258(19990715)18:13<1627::aid-sim159>3.0.co;2-d