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PATTERN OF CARDIOVASCULAR DISEASE IN THE ELDERLY INPATIENTS AT THAI BINH GENERAL HOSPITAL DURING 2019–2023

Le Manh Cuong[1*], Nguyen Van Chuyen[2], Ta Quang Thanh[3]

[1]*Viet Nam University of Traditional Medicine - 02 Tran Phu, Dai Mo Ward, Hanoi City, Vietnam*
[2]*Vietnam Military Medical University - 160 Phung Hung, Ha Dong Ward, Hanoi City, Vietnam*
[3]*Bac Thang Long Hospital - Group 1, Cao Lo Street, Dong Anh Dist, Hanoi City, Vietnam*

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ABSTRACT

Objective: To describe the pattern of cardiovascular diseases in elderly inpatients at Thai Binh General Hospital from 2019 to 2023.

Subjects and Methods: A retrospective, cross-sectional study was conducted by reviewing all medical records of inpatients aged ≥60 years hospitalized with cardiovascular diseases between 01/01/2019 and 31/12/2023.

Results: Over the 5-year period, 47,731 hospitalizations of elderly patients due to cardiovascular conditions were recorded (50.9% male; 49.1% female). The overall mean age was 67.1 ± 15.2 years and showed a gradual increase. The three most common disease groups were: other forms of heart disease (I30–I52) with 19,730 cases (in which arrhythmias accounted for 43.8% and heart failure 39.7%), hypertensive diseases (I10–I15) with 8,749 cases (70% essential hypertension), and ischemic heart diseases (I20–I25) with 7,102 cases (39.5% myocardial infarction and 36.6% angina pectoris). Among arrhythmias, atrial fibrillation and atrial flutter were predominant, accounting for 5,287 of 8,645 cases (61.2%).

Conclusion: In elderly inpatients with cardiovascular diseases at Thai Binh General Hospital during 2019–2023, the most prevalent conditions were arrhythmias, heart failure, hypertension, and ischemic heart disease.

Keywords: Cardiovascular diseases; disease pattern; elderly; inpatients; Thai Binh.

1. INTRODUCTION

Cardiovascular diseases (CVDs) remain the leading causes of mortality and disease burden worldwide, particularly in low- and middle-income countries. Moreover, the global burden of CVDs continues to rise. Between 1990 and 2019, the estimated number of CVD cases nearly doubled, increasing from 271 million in 1990 to 523 million in 2019, while the number of deaths rose from 12.1 million to 18.6 million [1].

Age is recognized as one of the most important risk factors for CVDs [2]. With the rapid development of socio-economic conditions and scientific progress, the average life expectancy has increased, leading to a greater burden of CVDs in the aging population. According to the study by Nguyen Xuan Kien (2023), the prevalence of CVDs among the elderly in the community was 59.2% [3]. Similarly, research conducted by Phan Chung Thuy Lynh (2024) reported that 74.5% of elderly patients visiting the family medicine clinic at Le Van Thinh Hospital in 2022 had CVDs [4].

CVDs in older adults often progress silently and may be masked by multiple comorbid chronic conditions, creating challenges in diagnosis, treatment, and long-term management. Therefore, understanding the pattern of CVDs is essential for guiding prevention strategies, resource allocation, and improving treatment outcomes. In addition, studies on the pattern of CVDs among hospitalized elderly patients in Vietnam in general and in Thai Binh in particular remain limited. Only a few studies have been conducted, such as those by Nguyen Thi Thao Suong (2025) [5], Le Dinh Thanh (2024) [6], Nguyen Van Bang (2025) [7], and Tran Song Giang (2024) [8].

Based on this practical need, the present study was carried out to describe the pattern of CVDs among elderly inpatients at Thai Binh General Hospital, thereby providing scientific evidence to support cardiovascular healthcare and management in older adults.

*Corresponding author
Email: dr.lemanhcuong@gmail.com **Phone**: (+84) 912234722 **DOI:** 10.52163/yhc.v66i8.4068

2. RESEARCH METHODS

2. 1. Study subjects

Elderly patients (≥ 60 years old) with cardiovascular diseases (CVDs) who were hospitalized at Thai Binh General Hospital from January 1, 2019 to December 31, 2023.

- Inclusion criteria

+ Patients aged ≥ 60 years diagnosed with CVDs and treated as inpatients at Thai Binh General Hospital.

+ Diagnosed and classified according to the ICD-10 system.

- Exclusion criteria

Patients whose medical records lacked essential study variables.

Patients admitted multiple times during the study period for the same reason for hospitalization were counted only once.

2.2. Study methods

- Study design

+ A cross-sectional descriptive study. Data were retrospectively collected from medical records.

- Sample size and sampling method

+ A total sampling method was applied. All patients meeting the inclusion and exclusion criteria were included in the study.

- Study variables

+ Demographic characteristics: age and sex.

+ Year of hospitalization.

CVDs and corresponding ICD-10 codes (Chapter IX: I00–I99, Diseases of the circulatory system), categorized into groups: Acute rheumatic fever (I00–I02); Chronic rheumatic heart disease (I05–I09); Hypertensive diseases (I10–I15); Ischemic heart diseases (I20–I25); Pulmonary heart disease and diseases of pulmonary circulation (I26–I28); Other forms of heart disease (I30–I52); Cerebrovascular diseases (I60–I69); Diseases of arteries, arterioles, and capillaries (I70–I79); Diseases of veins, lymphatic vessels, and lymph nodes not classified elsewhere (I80–I89); Other and unspecified disorders of the circulatory system (I95–I99).

For patients with multiple diagnoses, for example hypertension, atrial fibrillation, and heart failure, all diagnoses were recorded and considered equally for statistical analysis.

2.3. Data processing

Data were entered, managed, and analyzed using SPSS software version 22.0. Qualitative variables were presented as frequencies and percentages. Quantitative variables were presented as mean and standard deviation.

2.4. Research ethics

All collected information was used solely for scientific research purposes. Personal information of participants was kept confidential.

3. RESULTS

During the study period (2019–2023), a total of 47,731 elderly patients with cardiovascular diseases (24,284 males, accounting for 50.9%, and 23,447 females, accounting for 49.1%) were hospitalized at Thai Binh General Hospital. The distribution by sex varied across the years; however, the number of patients in both sexes showed an upward trend over time (Figure 3.1).

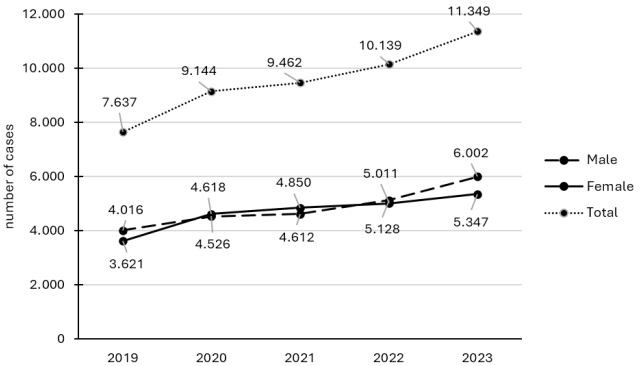

Figure 1. Distribution of hospitalized patients by sex across the years (2019–2023)

The overall mean age of the study population for the five years was 67.1 ± 15.2. The mean age tended to increase over time (Table 3.1).

Table 1. Mean age of the study population by year (2019–2023)

Year					
2019	2020	2021	2022	2023	5-year mean
Mean age					
66.3 ± 17.4	66.7 ± 15.2	67.1 ± 15.5	67.8 ± 15.8	68.1 ± 15.3	67.1 ± 15.2

The distribution of CVDs by disease groups remained relatively stable across the years. The three most common disease groups were other forms of heart disease (I30–I52), hypertensive diseases (I10–I15), and ischemic heart diseases (I20–I25) (Figure 3.2).

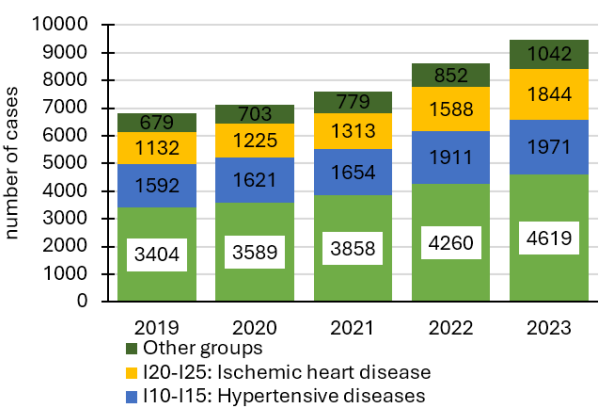

Figure 2. Distribution of CVD groups among the study population from 2019 to 2023

Table 2 shows that within the group of other forms of heart disease (I30–I52), arrhythmias and heart failure

accounted for the highest proportions, at 43.8% and 39.7%, respectively. Essential hypertension represented the majority (70%) among hypertensive diseases (I10–I15). In the ischemic heart disease group (I20–I25), myocardial infarction (39.5%) and angina pectoris (36.6%) were the most common diagnoses.

Table 2. Distribution of patients in the three most common CVD groups

ICD-10 Group				
ICD-10 Code & Disease	**Number**	**%**	**Total**	**% of 47.731 cases**
I30–I52: Other forms of heart disease				
I44–I49: Arrhythmias	8645	43.8	19730 (100%)	18.1
I50: Heart failure	7840	39.7		16.4
I40–I43: Cardiomyopathies	1709	8.7		3.6
I30–I32: Pericardial diseases	1096	5.6		2.3
I38–I39: Infective endocarditis	440	2.2		0.9
I10–I15: Hypertensive diseases				
I10: Essential hypertension	6118	70.0	8749 (100%)	12.8
I11–I15: Secondary hypertension	2631	30.0		5.5
I20–I25: Ischemic heart diseases				
I21–I22: Myocardial infarction	2805	39.5	7102 (100%)	5.9
I20: Angina pectoris	2601	36.6		5.4
I24: Other acute ischemic heart diseases	902	12.7		1.9
I25: Chronic ischemic heart disease	478	6.7		1.0
I23: Certain complications following acute myocardial infarction	316	4.4		0.7

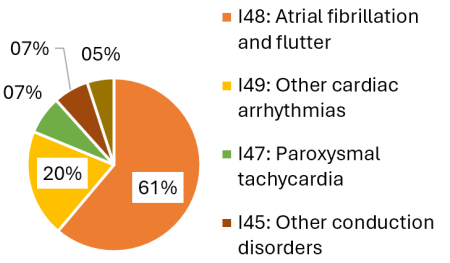

Figure 3. Distribution of patients with arrhythmias in the I44–I49 group (n = 8,645)

Among patients with arrhythmias, atrial fibrillation and atrial flutter accounted for the largest proportion, with 5,287 out of 8,645 cases (61.2%). Other arrhythmias ranked second, with 1,734 cases (20.1%).

4. DISCUSSION

This study analyzed 47,731 hospitalizations of elderly patients with cardiovascular diseases (CVDs) at Thai Binh General Hospital from 2019 to 2023. The number of hospital admissions steadily increased over this period, reflecting the ongoing trend of population aging and the growing burden of CVDs. The mean age of patients was 67.1 ± 15.2 years, showing a slight upward trend over time, which is higher than that reported by Le Dinh Thanh (2024) at Thong Nhat Hospital (63.34 ± 16.50) [6]. This difference may be attributed to variations in local population characteristics as well as disparities in healthcare access across different regions.

In our study, the proportion of male patients was slightly higher than that of females (50.9% vs. 49.1%), consistent with the findings of Nguyen Thi Thao Suong (2025) (52.0% vs. 48.0%) [5]. Although hospitalizations for both sexes increased over the years, the male-to-female ratio remained approximately 50%. This differs from the study by Tran Song Giang (2024) in Ha Giang, where the proportion of male patients gradually increased over time [8]. Differences in risk factors between sexes may partly explain this observation: males tend to develop CVDs earlier and have a higher risk of acute coronary events, whereas females show a rising incidence of CVDs after menopause due to hormonal changes. Moreover, demographic distributions and gender-specific health-seeking behaviors may contribute to these differences.

In our cohort, the three most prevalent groups of conditions were “other heart diseases” (I30–I52) with 19,730 cases (41.3%), hypertension (I10–I15) with 8,749 cases (18.3%), and ischemic heart disease (I20–I25) with 7,102 cases (14.9%). The most common clinical manifestations were arrhythmias (18.1%), heart failure (16.4%), and primary hypertension (12.8%).

Previous studies reported varying patterns of CVD prevalence among the elderly. Nguyen Van Bang (2025) identified hypertension (54.43%), ischemic heart disease (19%), cerebrovascular disease (17.71%), and arrhythmias (10.57%) as the most common [7]. Nguyen

Thi Thao Suong (2025) reported hypertension (72.44%), arrhythmias (40.58%), heart failure syndrome (19.47%), and cerebrovascular disease (11.58%) [5]. Le Dinh Thanh (2024) found hypertension (57.95%), ischemic heart disease (43.33%), arrhythmias (26.12%), and heart failure (10.91%) [6]. Tran Song Giang (2024) reported the top five hospitalized CVDs as valvular heart disease (30.8%), hypertension (20.4%), arrhythmias (20.2%), heart failure (19.8%), and chronic ischemic heart disease (18.3%) [8].

Differences in CVD prevalence across studies likely reflect the population characteristics of specific regions and the unique profiles of individual hospitals. Methodological differences may also play a role. In our study, patients with multiple diagnoses—for instance, hypertension, atrial fibrillation, and heart failure—were counted under all relevant conditions, with each diagnosis treated equally for statistical purposes.

Despite these variations, several similarities emerge: arrhythmias, heart failure, hypertension, and ischemic heart disease consistently rank among the most common conditions, highlighting their importance in health policy planning. Hypertension, in particular, is highly prevalent among the elderly. According to Nguyen Xuan Kien (2023), 59.0% of elderly individuals in the community have hypertension [3]. It remains a major public health challenge and a key risk factor for other CVDs, including ischemic heart disease, stroke, and heart failure, potentially leading to disability and mortality. In Nguyen Xuan Kien's study, 98.7% of elderly patients with CVDs had hypertension [3]. These findings underscore the urgent need for early screening and effective management of hypertension in both the general population and older adults specifically.

Arrhythmias (particularly atrial fibrillation and atrial flutter) and heart failure were also highly prevalent, consistent with their common occurrence in elderly patients with multiple comorbidities. Among patients with ischemic heart disease (I20–I25), myocardial infarction (39.5%) and angina pectoris (36.6%) were the most frequent conditions, highlighting the need for targeted prevention and prompt management of acute cardiovascular events.

5. CONCLUSION

Over the five-year period from 2019 to 2023 at Thai Binh General Hospital, the number of cardiovascular disease cases among elderly patients showed an increasing trend. The overall mean age was 67.1 ± 15.2 years. The three most prevalent disease groups were: "other heart diseases" (I30–I52) with 19,730 cases (of which arrhythmias accounted for 43.8% and heart failure for 39.7%), hypertension (I10–I15) with 8,749 cases (of which primary hypertension accounted for 70%), and ischemic heart disease (I20–I25) with 7,102 cases (of which myocardial infarction accounted for 39.5% and angina pectoris for 36.6%). Among arrhythmias, atrial fibrillation and atrial flutter were the most frequent, comprising 5,287 out of 8,645 cases (61.2%). These results reflect the general pattern of CVDs in elderly patients, highlighting the high prevalence of arrhythmias, heart failure, hypertension, and ischemic heart disease.

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