

# Risk factors, Incidence and Outcome of Stroke: A Retrospective Cross-Sectional Hospital-Based Study Comparing Young Adults Versus Elderly

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## Abstract

- There has been a noticeable increase of up to 40% in the incidence of stroke among young population (age <45 years) over the past decade.<sup>(1)</sup>
- Retrospective, cross-sectional, hospital-based study was conducted in King Hamad University Hospital in the Kingdom of Bahrain
- Hypertension was the leading risk factor for developing stroke in both age groups

## Objectives

To compare incidence and risk factors of stroke in young patients with older patients in Kingdom of Bahrain.

## Introduction

There are some alarming trends that noted an increase in the incidence of stroke in younger populations. Of all first ever strokes, an estimate of 10-15% occur in younger adults.<sup>(2)</sup> Vascular risk factors, infections, tobacco abuse were some of the commonly reported risk factors for stroke among the young population.<sup>(2,3)</sup>

## Material and Methods

In this study, the patients were split into two categories. The first being young adults between the age of 18 up until the age of 45. The second group was the elderly that includes ages 46 and older.

All young adult patients that were diagnosed with stroke (based on ICD-10 classifications) were included in the study. These diagnoses were only present from 2018-2020 as the incidences rose in younger populations. All patients had an activated Code Stroke in the emergency department.

Data was categorized according to year, gender, ethnicity, subtype of stroke diagnosis (ischemic stroke, intra-cerebral hemorrhage, or unspecified stroke) and main contributing risk factors. These factors include Diabetes, hypertension, dyslipidemia, underlying coronary artery disease or atrial fibrillation, previously diagnosed stroke or transient ischemic attack, peripheral arterial disease, and smoking.

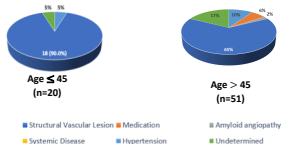
Descriptive statistics was used to compute the frequencies and percentages. Chi-square test was used to compare significant differences between two groups with categorical data. Relative risk was computed. All the statistical test was 2-tailed, and a p value of <0.05 was considered significant.

## Results

Fig 1: Comparison of risk factors among young and older patients (n= 531)

	Age < 45 (n = 93)	Age > 45 (n = 438)	P value
Diabetes			
Yes	23 (24.7%)	267 (63.0%)	0.000
No	70 (75.3%)	162 (37.0%)	
Hypertension			
Yes	40 (43.0%)	324 (74.0%)	0.000
No	53 (57.0%)	114 (26.0%)	
Dyslipidemia			
Yes	15 (16.1%)	141 (32.2%)	0.002
No	78 (83.9%)	297 (67.8%)	
Coronary artery disease/ Atrial fibrillation			
Yes	6 (6.5%)	122 (27.9%)	0.000
No	87 (93.5%)	316 (72.1%)	

Fig 2: Distribution of hemorrhagic stroke among patients ≤ 45 and > 45 years of age



## Conclusion

Over a period of two years in a tertiary center stroke unit, 17% of stroke patients were under the age of 45, comparable to estimates of 10-15% in developing countries.<sup>(2)</sup>

The most common risk factor in patient less than 45 years of age was hypertension (43.0%), followed by diabetes mellitus (24.7%) and dyslipidaemia (16.1%). Similar pattern was seen in patients greater than 45 years of age (hypertension: 74.0%, diabetes mellitus: 63.0%, dyslipidaemia: 32.2%).

Young patients had higher incidence of haemorrhagic stroke compared to older population ([18 (90.0%) vs 33 (64.7%)], p = 0.001). This can be explained by the increased prevalence of hypertension in young adults which if uncontrolled can lead to higher incidence of hemorrhagic strokes.

## References

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