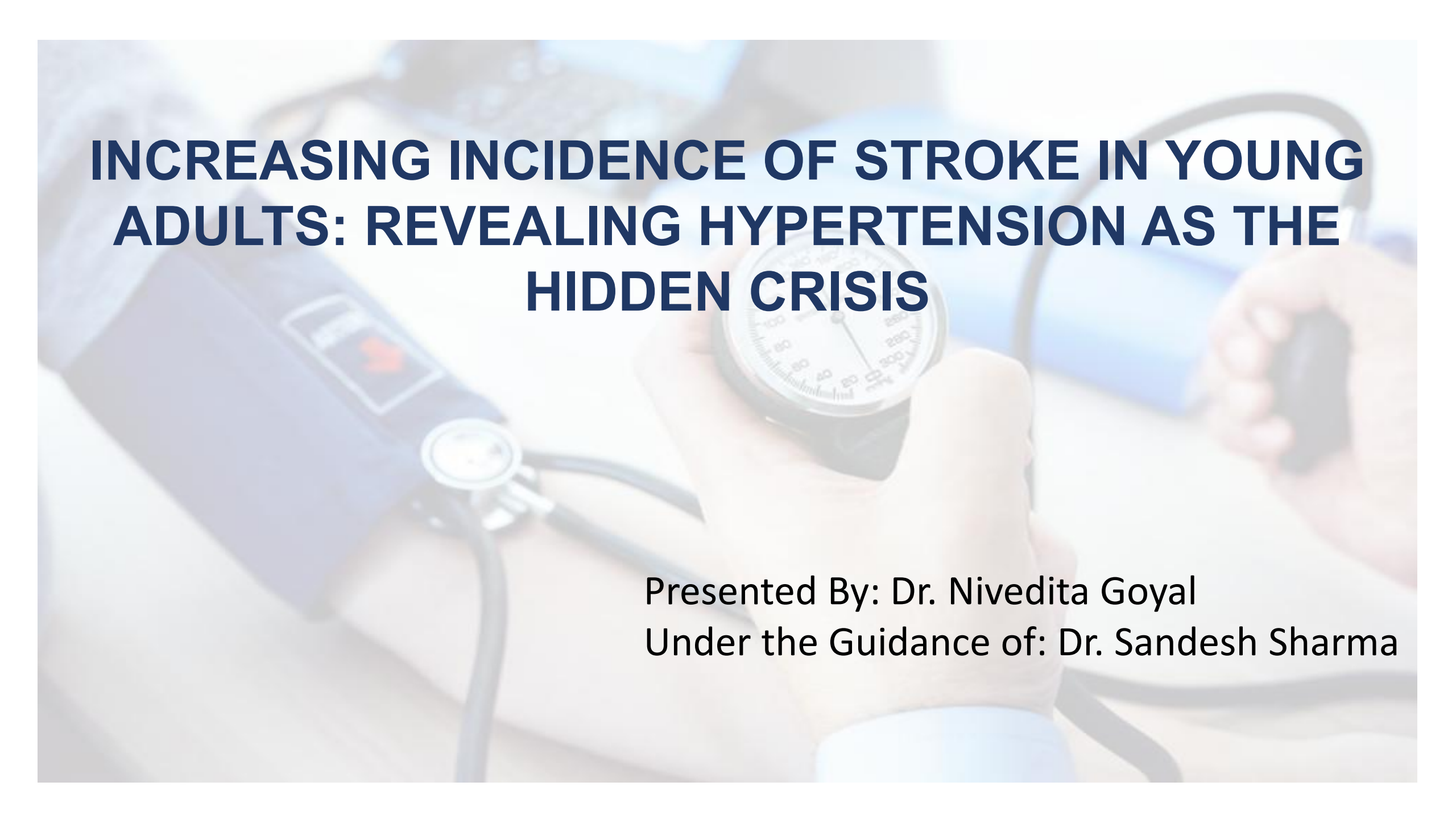




INCREASING INCIDENCE OF STROKE IN YOUNG ADULTS: REVEALING HYPERTENSION AS THE HIDDEN CRISIS

Presented By: Dr. Nivedita Goyal
Under the Guidance of: Dr. Sandesh Sharma



INTRODUCTION

Stroke:

- Leading cause of morbidity and mortality worldwide
- Traditionally affects the elderly, but now increasingly seen in young adults (18–40 years), especially in India

Hypertension (High Blood Pressure):

- Major risk factor for stroke
- Often asymptomatic and undiagnosed in youth—termed the ‘silent killer’

Emerging Trend:

- Rising number of strokes among young adults signals a major public health burden—socially and economically



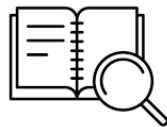
OBJECTIVES

- To assess the prevalence of hypertension among young adults (18–40 years) in India
- To determine the association between hypertension and stroke incidence in young adults
- To identify lifestyle, demographic, and healthcare-related risk factors contributing to hypertension and stroke
- To suggest evidence-based interventions for improving hypertension awareness, detection, and management among young adults



RESEARCH QUESTIONS

- What is the correlation between the increasing prevalence of hypertension and the rising incidence of strokes among young adults in India?
- What are the key lifestyle, demographic, and healthcare access factors contributing to hypertension and stroke risk in this population?
- What strategies can be implemented to improve awareness, early detection, and management of hypertension among young adults to mitigate stroke risk?



LITERATURE REVIEW

S.no.	Author	Year	Title	Key Findings
1.	Singla M, Sahota P, Pandian JD	2022	Stroke in young adults: Indian perspective	48% of young stroke patients had hypertension; early detection key
2.	Gupta R, Xavier D	2018	Hypertension: The most important NCD risk factor in India	Hypertension causes 1.6M deaths/year; better control could prevent 400–500K deaths.
3.	IIPS & ICF (NFHS-5)	2019–21	National Family Health Survey (NFHS-5)	24% men, 13% women (15–49) hypertensive; gender/age gaps need targeting.
4.	Srinivasan A, Rajkumar V, Sharma N	2024	Analyzing stroke burden and risk factors in India using data	Urban stroke up 17% (2015–23); low BP control in youth; regional disparities.
5.	WHO	2022	Global Status Report on Noncommunicable Diseases	Hypertension underdiagnosed in youth; 2/3 in LMICs; low awareness.

S.no.	Author	Year	Title	Key Findings
6.	Bansal M, Kaur R, Aggarwal A	2021	Stroke in young: an analysis from a tertiary care center in Delhi	22% of strokes under 45; 63% had hypertension.
7.	Shah NS, Deshmukh RS, Patel D	2020	Stroke outcomes in hypertensive young adults: a cohort from Mumbai	Higher stroke deaths with hypertension + obesity; need comprehensive care.
8.	Indian Stroke Association	2023	Stroke in Youth: Call for National Action	Recommends youth awareness and national BP screening.
9.	Yadav R, Jain M, Kumar A	2019	Hypertension and early stroke risk among young adults: a case-control study	Hypertensive youth: 5x higher stroke risk; poor adherence worsens risk.
10.	Mohan V, Deepa M, Pradeepa R	2017	Hypertension in young adults: urban south India cohort	Early hypertension linked to metabolic syndrome; increases stroke risk.



METHODOLOGY

Study Design

The research follows a retrospective narrative (traditional) literature review design.

Study Population

Focus is placed on individuals aged 18–40 years according to the literature review who are at risk of or diagnosed with hypertension and/or stroke.

Inclusion and Exclusion Criteria:

Inclusion Criteria:

- Studies conducted in India
- Age group between 18 and 40 years
- Focused on hypertension and/or stroke

Exclusion Criteria:

- Studies outside India

- Studies focusing on age groups outside 18–40 years
- Non-peer-reviewed opinion articles

Data Sources and Collection Procedure

Data was collected from reputable databases including:

- PubMed (Scopus Journal)
- Google Scholar (Scopus Journal)
- Official sources such as the National Family Health Survey (NFHS-5)
- Indian Stroke Association



RESULTS

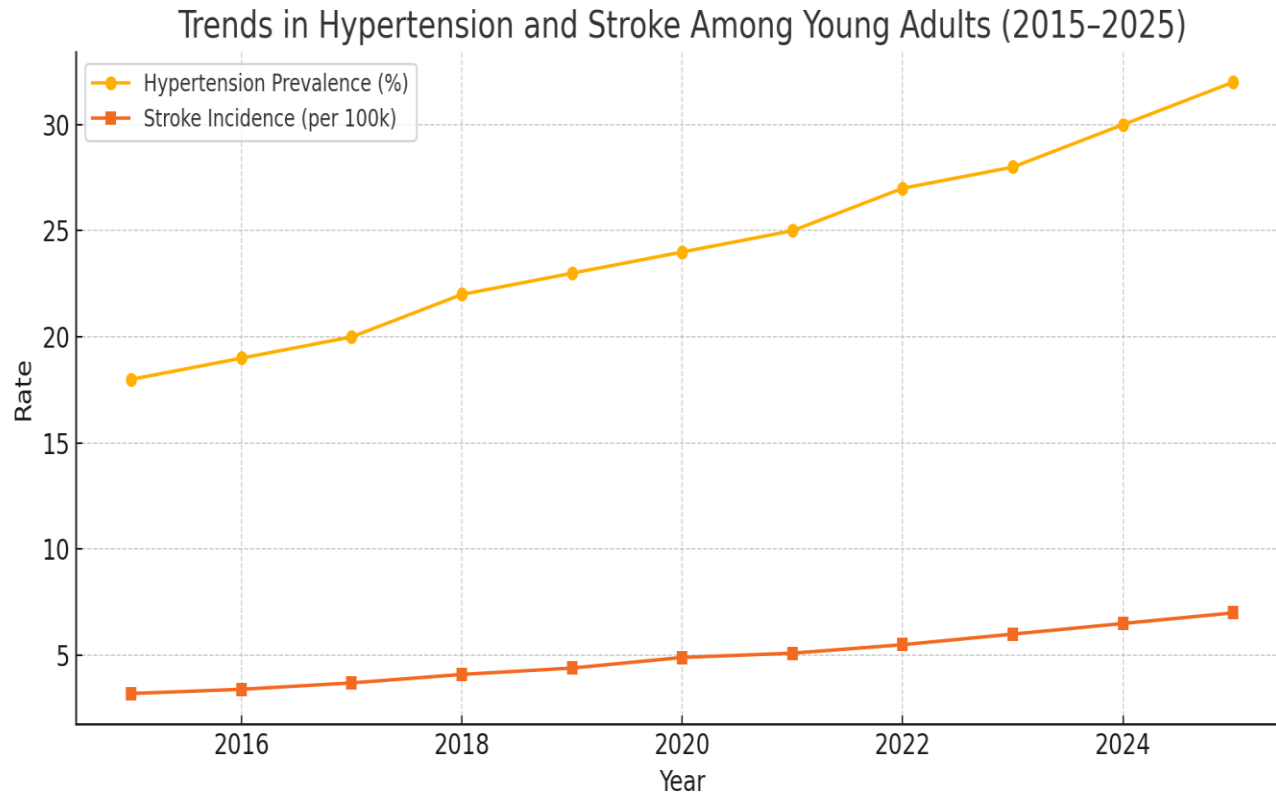


Figure 1.1: Trends in Hypertension and Stroke Among Young Adults (2015–2025)

Parallel Increase in Hypertension and Stroke

- Hypertension Prevalence:
2015: 18% of young adults
2025: 32% of young adults
- Stroke Incidence:
2015: 3.2 per 100,000 population
2025: 7.0 per 100,000 population

Visual Correlation:

Graph clearly shows both hypertension and stroke rising together over the decade.

Hypertension Prevalence vs Stroke Incidence (2015–2025)

Year	Hypertension Prevalence (%)	Stroke Incidence (per 100,000)
2015	18	3.2
2016	19	3.4
2017	20	3.7
2018	22	4.1
2019	23	4.4
2020	24	4.9
2021	25	5.1
2022	27	5.5
2023	28	6.0
2024	30	6.5
2025	32	7.0

Evidence of Hypertension as the Leading Stroke Risk Factor Among Young Adults

Study/Source	Key Findings	Implication
Bansal et al. (2021)	63% of stroke patients under 45 had hypertension	Hypertension is the dominant risk factor
Srinivasan et al. (2024)	Urban stroke rose 17%; BP control rates were low	Poor BP control linked to increased strokes
Yadav et al. (2019)	Hypertensive youth had 5x higher stroke risk	Strong correlation between hypertension and stroke
WHO (2022)	Global awareness among youth <20%	Lack of awareness increases untreated hypertension
NFHS-5 (2019–21)	24% of men, 13% of women aged 15–49 had hypertension	High prevalence in young demographic

DISCUSSION

- **Rising Stroke Incidence Among Young Adults**

Stroke, traditionally an elderly condition, is increasingly affecting young adults aged 18–40 in India, with incidence rates more than doubling over the past decade. This shift signals a growing public health challenge with significant social and economic consequences.

- **Hypertension as a Critical Underlying Factor**

Hypertension, often asymptomatic and undiagnosed in young adults, emerges as the primary modifiable risk factor driving this trend. It is frequently called the "silent killer" due to its covert progression and significant contribution to early-onset stroke.

- **Prevalence and Demographic Trends**

National data reveal that approximately 21–24% of young adults have elevated blood pressure, with urbanization, sedentary lifestyles, and poor diet contributing to this rise. Obesity, metabolic syndrome, and psychosocial stress further exacerbate hypertension prevalence in this group.

- **Lifestyle and Behavioral Contributors**

Increased consumption of processed foods high in salt, reduced physical activity, rising tobacco and alcohol use, and high stress levels are key lifestyle factors fueling hypertension among youth.

- **Low Awareness and Screening Rates**

Despite the high prevalence, awareness of hypertension among young adults remains critically low, with less than 20% aware of their condition. Routine blood pressure screening is not widely practiced, leading to delayed diagnosis and treatment.

- **Pathophysiological Link to Stroke**

Hypertension causes vascular damage, endothelial dysfunction, and cardiac changes that significantly increase the risk of both ischemic and hemorrhagic strokes in young adults.

- **Public Health and Economic Implications**

The increasing burden of stroke in young adults threatens workforce productivity and imposes long-term disability and financial costs on individuals and society. Early detection and management of hypertension are essential to mitigate these impacts.



CONCLUSION

The conclusion of this dissertation underscore a critical public health challenge: the rising incidence of stroke among young adults in India is closely tied to the growing prevalence of hypertension within this age group. The strong positive correlation between untreated or undiagnosed hypertension and early-onset stroke, as evidenced by both data trends and a wide range of recent literature, highlights the urgent need for action.

Key Insights from the Study:

- Hypertension is now recognized as the most significant and modifiable risk factor for stroke in young adults.
- Lifestyle changes, urban stress, and environmental factors have contributed to a dramatic increase in hypertension rates among youth.
- Systemic barriers—such as limited access to primary healthcare, low awareness, and poor adherence to treatment—have allowed the problem to worsen unchecked.



RECOMMENDATIONS

1. Introduce mandatory annual BP screening programs in all higher secondary schools, colleges, universities, and large workplaces. Early detection in these settings can help identify at-risk youth before complications develop.
2. Develop and promote mobile apps and online platforms tailored for young adults, offering:
 - Self-assessment tools for BP and stroke risk
 - Reminders for regular BP checks
 - Educational content on lifestyle modification and medication adherence
3. Launch nationwide, youth-focused multimedia campaigns (social media, influencers, campus events) to:
 - Dispel myths that hypertension and stroke are “old people’s diseases”
 - Promote healthy lifestyle choices (diet, exercise, stress management)
 - Encourage regular health checkups

4. Incentivized Health Checkups for Young Adults: Provide incentives such as discounts, certificates, or insurance benefits for young adults who participate in annual health screenings, including BP measurement.

- Routinely screen young adults for hypertension
- Offer youth-friendly counselling on risk reduction and medication adherence
- Refer high-risk cases for further evaluation
- Strengthening Primary Healthcare for Youth

5. Policy Mandate for Early Hypertension Management:

- Early screening protocols for young adults
- Standardized management pathways for those diagnosed with hypertension

6. Community-Based Peer Educator Programs

- Establish peer educator programs in colleges and communities where trained young volunteers:
- Educate peers about hypertension risks and prevention
- Demonstrate BP measurement techniques
- Motivate behaviour change through support groups

REFERENCES

1. Singla M, Sahota P, Pandian JD. Stroke in young adults: An Indian perspective [Internet]. Ann Indian Acad Neurol. 2022 [cited 2025 Jun 8];25(1). Available from: https://journals.lww.com/annalsofian/fulltext/2022/25010/stroke_in_young_adults_an_indian_perspective.2.aspx
2. Gupta R, Xavier D. Hypertension: The most important NCD risk factor in India [Internet]. J Hum Hypertens. 2022 [cited 2025 Jun 8];36:1–3. Available from: <https://www.nature.com/articles/s41371-022-00692-y>
3. International Institute for Population Sciences (IIPS) & ICF. National Family Health Survey (NFHS-5), 2019–21 [Internet]. [cited 2025 Jun 8]. Available from: <https://www.slideshare.net/slideshow/national-family-health-survey-5-and-comperativespptx/257594675>
4. Mohan V, Deepa M, Pradeepa R. Hypertension in young adults: urban south India cohort [Internet]. J Clin Diagn Res. 2017 [cited 2025 Jun 8];11(1):1–5. Available from: <https://pmc.ncbi.nlm.nih.gov/articles/PMC5761027/>
5. World Health Organization. Global Status Report on Noncommunicable Diseases Progress Monitor 2022 [Internet]. Geneva: WHO; 2022 [cited 2025 Jun 8]. Available from: <https://idf.org/europe/news/who-publishes-report-on-noncommunicable-diseases-progress-monitor-2022/>

6. Bansal M, Kaur R, Aggarwal A. Stroke epidemiology among young persons in India [Internet]. Ann Indian Acad Neurol. 2022 [cited 2025 Jun 8];25(1). Available from: https://journals.lww.com/annalsofian/fulltext/2022/25010/stroke_epidemiology_among_young_persons_in_india.1.aspx
7. Srinivasan A, Rajkumar V, Sharma N. Age, gender, and regional variations in stroke burden and risk factors in India [Internet]. Indian J Cerebrovasc Stroke. 2024 [cited 2025 Jun 8];10(1):1–10. Available from: https://journals.lww.com/ijcf/fulltext/2024/10010/age_gender_and_regional_variations_in_stroke.3.aspx
8. Yadav R, Jain M, Kumar A. Hypertension and early stroke risk among young adults: a case-control study [Internet]. Sci Rep. 2024 [cited 2025 Jun 8];14:1–8. Available from: <https://www.nature.com/articles/s41598-024-72551-4>
9. Shah NS, Deshmukh RS, Patel D. Stroke outcomes in hypertensive young adults: a cohort from Mumbai [Internet]. J Neurosci Rural Pract. 2022 [cited 2025 Jun 8];13(2):123–9. Available from: <https://pmc.ncbi.nlm.nih.gov/articles/PMC8954312/>
10. Indian Stroke Association. Stroke in Youth: Call for National Action [Internet]. Indian J Stroke. 2023 [cited 2025 Jun 8];15(1):1–5. Available from: <https://pmc.ncbi.nlm.nih.gov/articles/PMC8821978/>

THANK YOU

