

# Stroke: The Neglected Epidemic, an Indian perspective

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## Abstract

It is well known that in most developed countries cerebrovascular disease (CVD) or stroke is a common cause of death and disability. In U.S.A. and U.K., stroke ranks third as a cause of death after heart disease and cancer. The annual economic consequence due to CVD has been estimated to exceed 7 billion dollars in USA<sup>1, 2</sup>. Prevalence rates reported for cerebrovascular accident (CVA) worldwide vary between 500 to 800 per 100,000 population. Oriental studies have shown higher prevalence and incidence rates.<sup>1</sup> Precious little is known about the epidemiology of stroke in India and of the Indian subcontinent in general. Is this burden same as in the West? Expectation rate of 600 in the occident and perhaps 900 in orient for the prevalence seems plausible<sup>1</sup>.

Do we have enough data to estimate the burden of stroke in India? India's population is one billion plus, taking a prevalence rate of 900 per 100,000 into account, stroke is then indeed occurring in epidemic proportions in India. It is a matter of regret that our knowledge about epidemiology of stroke in India is so poor. So if stroke is occurring in epidemic proportions, then indeed it is a neglected epidemic.

## STROKE IN INDIA

Epidemiology, originally signified the study of epidemics, but it is now used more broadly for the study of groups: epi=among; demos= people; logos=study. India is a vast country with diverse geographic variation. The population stands above one billion and life style of people varies in different parts of the country. It is a multi-ethnic, multi-cultural, multi-religious society. There are many religions sects with different life styles. Food habits vary in different religious groups. Some like the Jains and Buddhists are strict vegetarians while meat and meat products are an integral part of the diet of the Sikhs and Punjabis. Some literally drink "Ghee" a native cooking oil rich in saturated fats. Some till recently have not used salt in cooking as people from Mizoram. Some don't smoke but instead eat tobacco. It would be interesting and highly educative to study the epidemiology of stroke in such a diverse group.

Unfortunately in India, epidemiological information on annual incidence, prevalence rates, morbidity and mortality trends in well defined populations is not available. Most of data published is from retrospective analysis of subjects admitted to urban medical hospitals though the majority of Indian population lives in small towns and villages. Some of the studies lack proper stroke terminology and baseline investigations.

Despite these limitations, analysis of data collected from major urban hospitals suggests that nearly 2% of all hospital admissions; 4-5% of medical and 20% of neurological admission have CVD. The incidence of stroke in the young (< 40 years of age) is high (13 to 32%) when compared to similar data from the west. Literature is available suggesting that risk of coronary artery disease (CAD) is higher in Indians specially in the young population.<sup>3,4,5,6</sup> We know that the risk factors for stroke and coronary artery disease are same. We also know that coronary artery disease is being reported more and more in people of Indian origin, whether staying in India or abroad, as compared to Western population. Will it then be fair to assume that incidence of stroke and its prevalence may be higher in Indians too? <sup>3, 4, 5</sup>

Many studies on epidemiology of stroke in India are deficient with respect to randomization of data, making comparison between them difficult. In addition, many of these studies are published in local journals, which are not indexed and therefore difficult to retrieve from, or have been only published as abstracts. Table I presents a summary of crude prevalence rate by survey of hemiplegia presumed to be CVD from different parts of India namely the north, south, west and east <sup>7,8,9,10,11,12,13,14,15,16</sup> This data show prevalence of CVD in the range of 52 to 843 per 100,000 population. Only data from the Paris Community (Bombay),

(843/100,000) comes somewhere near the expected rate of 900/100,000 in the oriental population. Lower rate reported in other studies may be due to several factors. In some only hemiplegia was taken as a crude indicator of stroke. Further, perhaps the method of collection of public health data was faulty.

In India, particularly in rural areas, the health care delivery system is still deficient, both in quality and coverage. Accurate and current census data is not available, and the number of well trained physicians and health workers are limited, rendering the proper study of neuroepidemiology of CVD difficult. As we do not know the real burden of various diseases, planning of health services and distribution of resources is difficult and at times an educated guess at the best.

**Figure 1**

**Table 1: India: Crude Prevalence Rate By Survey Of Hemiplegia Presumed To Be CVA.**

<b>Zones</b>	<b>City/Area</b>	<b>R/U/SU</b>	<b>HH/Q.</b>	<b>In Subjects</b>	<b>Tn: ?CVD</b>	<b>P.R./100,000</b>	<b>(A.A.)</b>
	Kashmir(7)	U	HH	63,645	91	143/100,000	(274)
<b>North</b>	Rohtak(8)	U	?HH	79,046	35	44/100,000	(46)
	1975/1998	R	?HH	51,165	23	45/100,000	(47)
	Ballabhabgarh(9)	R	Q/HH	4,786	6	125/100,000	(NA)
<b>West</b>	Bombay(10)	U	Q	14,010	118	843/100,000	(424)
	Bombay(11)	U					
		20+yr	HH	5,723	14	245/100,000	(NA)
		(all ages)	Q/H	3, 18,522	*704	222/100,000/4YRS	
		(Hindu)					(NA)
	Vellore(12)	SU	Q/HH	2,38,576	147	57/100,000	(84)
	1969/1971		Q/HH	84,484	54	64/100,000	(94)
<b>SOUTH</b>							
	Gpwrnodamir(13)	R	/HH	57,660	30	52/100,000	(NA)
	Bengal(14)	R	Q/HH	37,286	47	126/100,000	(NA)
	(Malda)						
<b>EAST</b>	Bihar(15)	R	Q/HH	5,806	6	103/100,000	(NA)
	(Chotanagpur)						
	Assam(16)	SU	Q/HH	14,200	38	270/100,000	(NA)
	(Guwahati)						
	Calcutta(17)	U		50,291	36	147/100,000	
<hr/>							
Crude Prevalence rate				Overall range: 90 to 222/100,000			
for completed stroke				(TIA and sudden death- Not accounted)			
*: Confirmed CVA by tests.				NA : Not available			

R : Rural

U : Urban

SU : Semi-Urban

Tn : Total Number

CVD : Cerebrovascular Disease

PR : Prevalence Rate

HH : House to House

Q : Questionnaire

AA : Age Adjusted.

Another striking thing in India is the lack of awareness about stroke and stroke prevention. The biggest thing which has

happened to stroke and its management In India is not tPA rather coining of the word “Brain Attack”. For a change neurologists left their ivory towers and spoke in a layman's language. Unless people know what disease we are talking about, one cannot collect any meaningful epidemiological data or talk about prevention of the disease. The best treatment of stroke still remains its prevention. For every lecture a neurologist gives on tPA he should give at least ten on primary and secondary prevention of stroke. We are already paying a heavy price for negligence of this simple fact. What about negligence on part of the patient? Indians, by large, are not health conscious. There is no social security system and no worthwhile health insurance. The feeling is that some how their “Karma” will save them from disease or if unfortunately they fall sick, God shall look after them.

India may be a poor country but it is rich in computer hardware and software technology. Computers are rapidly spreading to towns and villages. Medical authorities with the help of the mass-media should make interesting programs to educate people about stroke, its warning signs and how to prevent it. Educating of the masses should be the primary goal. Neurological associations and societies should have a patient forum to convey this message to the public. Once this is achieved, we shall be in an excellent position to study the epidemiology of this epidemic, till then this epidemic remains largely neglected.

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