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Very old age & incidence of spontaneous Intracerebral Haemorrhage

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Abstract

Background: Spontaneous Intracerebral Haemorrhage (ICH) may be defined as it is the bleeding within brain tissue in absence of trauma or surgery. Usually it occur lesser than ischemic stroke but is much higher disabling and deadly than all types of stroke. Although adult age is more susceptible than younger age; but incidence in very older group is still ambiguous. The purpose of this study is to observe spontaneous ICHs in various age group specially in very old age.

Methods: A total 186 patients were diagnosed as spontaneous haemorrhagic stroke and they have been first time reported & admitted in Combined Military Hospital (CMH) Dhaka, between January 2018 and October 2019. Diagnosis was based upon details history, meticulous clinical examination and finally confirmed by non-contrast Computed Tomography (CT) scan of brain. Statistical analyses were performed by using Statistical Package for Social Sciences (SPSS) version 26.

Results: Total 186 patients were admitted in CMH Dhaka from Jan 2018- Oct 2019 and selected for our study who full-fill the criteria. Male patients were 137(73.66%), female 49(26.34%) and aged 18 years and above.

There is remarkable relationship of spontaneous intracerebral haemorrhage with the age variables. Rate of spontaneous ICH among age group, $\geq 25 - 74$ years, 175(94.08%) whereas < 25 years only 1(.54%) and 75-79 years 8(4.30%) and ≥ 80 years 2(1.08%) patients. So raising age like middle and old age affected much 183(98.38%) but very old age is less affected only 2(1.08%) patients. Regarding aetiology of spontaneous ICHs of 186 patients, Hypertensive 124(66.67%), Coagulopathy 16(8.60%), Amyloid angiopathy 14(7.53%), Idiopathic 12(6.45%) and hypertension is most common association.

Conclusion: Hypertension, coagulopathies are most risk factors of ICHs. Advancement of age of patients are more susceptible to haemorrhagic stroke but very old age is less vulnerable to spontaneous ICH.

Keywords: Very old age, computed tomography (CT) scan, intracerebral haemorrhage (ICH)

Introduction

Spontaneous ICH may be defined as bleeding within the brain tissue in absence of trauma or surgery.

There are two varieties of Cerebrovascular Disease (CVD) ischemic and haemorrhagic. Ischemic stroke is more common than haemorrhagic one. Haemorrhagic stroke mostly evident in hypertensive patients ^[1].

Incidence of stroke is 334-424/100,000 in urban area and 84-262/100,000 in rural area ^[2].

Usually, CVD increases with advancement of age and number of stroke cases also increases as life expectancy going up, with doubling in stroke death ^[3].

Spontaneous intracerebral haemorrhage is most disabling and life-threatening variety of strokes. Mortality rate in ICH is about 40% at 1 month, 54% at 1 year and around 25.5% patients may lead long-term functional independent life ^[1].

Risk factors for spontaneous ICH mainly: old age, male sex, cigarette smoking, alcohol, DM and sympathomimetic drugs ^[1].

Aetiological factors of ICH: Primary- HTN (mostly), Amyloid angiopathy, Secondary- Anti-thrombotic or Thrombolytic drugs, Vascular malformation (Aneurysm, AVM), Tumour, Vasculitis ^[4].

There are different thoughts regarding pathophysiology of spontaneous ICH. Spontaneous ICHs mostly occurred by ruptured degenerated blood vessels due to long-standing hypertension. Most degeneration occurred in tunica media and smooth muscles that subsequent develops tiny lipohyalinotic aneurysms succeeding rupture aneurysm ^[5].

In young age; intracerebral haemorrhages are mainly due to vascular malformation and lobar in region [6]. Deposition of amyloid in cortical vessels may produce micro-aneurysm leads to rupture and produce ICH. Mostly it is lobar in nature and affects older age group [7]. Primary brain damage in acute ICH; due to mass effect of haematoma, producing raised intracranial pressure (ICP) followed by reduction of cerebral perfusion with possibility of herniation [8]. (Figure-1).



Fig 1: Spontaneous ICH (Rt)

Raised blood pressure as well as haemorrhagic stroke had great relation with age.

Young age group having increased elasticity of vascular wall with more compliance of blood pressure, organ growth with utilization of nutrition, high catabolism with burning energy producing stuff and thus less possibility of increased blood pressure [9].

Haemorrhagic stroke in young age is very rare those who have not coagulopathy or vascular malformation [6].

In 2003, Lee *et al.* [10], showed that reduction of stroke 27% in highly active and 20% in moderately active adult personnel.

And interestingly; very older age group reduce response to beta adrenergic receptor and sympathetic stimulation, increased vagal tone with blunted baroreflexes. All these cumulative responses induced reduction of blood pressure, although hardening of vascular wall is not significant [11].

In this background to come into conclusion we tried to find out age relation with spontaneous ICH specially prevalence in very older age group in CMH Dhaka, Bangladesh.

Materials and Methods

This is our prospective variety of study. All haemorrhagic stroke patients were admitted and radiologically confirmed

in Neurosurgery Centre, CMH Dhaka, during the period January 2018 to October 2019, were enrolled. Most of the patients were hypertensive, other patients having coagulopathy, DM and mixed co-morbidity. Total 186 patients in either age & sex variables from 18 years to 100 years were randomly selected and diagnosed by history, clinical examination and finally confirmed with CT scan of brain.

Keen analysis of patients and thorough evaluation was done by clinical and radiological data from hospital record, picture archive and communication system.

Computed tomographic evidence of any volume of spontaneous ICH was included in this study. Those 18 years and above aged cases irrespective of gender, co-morbidities such as HTN, coagulopathy, DM were included in our study; but unwilling of participation were excluded. Statistical analysis of this study was conducted by SPSS version 26.

Results

Total 186 numbers of patients with spontaneous ICH were admitted from Jan 2018-Oct 2019 in CMH Dhaka. All were evaluated properly by history, clinical examination and relevant investigation.

Among 186 spontaneous intracerebral haemorrhages, female were only 49(26.34%) & maximum 137(73.66%) were male (Fig-2)

Regarding age group; ICH positive, $\geq 25 - 74$ years 175(94.08%) whereas < 25 years only 1(.54%), 75-79 years 8(4.30%) and ≥ 80 years 2(1.08%); so very old age group affected only 1.08%(Figure-3).

Regarding aetiology of spontaneous ICH; HTN 124(66.67%), Coagulopathy 16(8.60%), Amyloid angiopathy 14(7.53%), Vascular Malformation 13(6.99%), Tumour 4(2.15%), Haemorrhagic conversion of ischemic stroke 3(1.61%), Idiopathic 12(6.45%); and mostly HTN 66.67% (Fig-4).

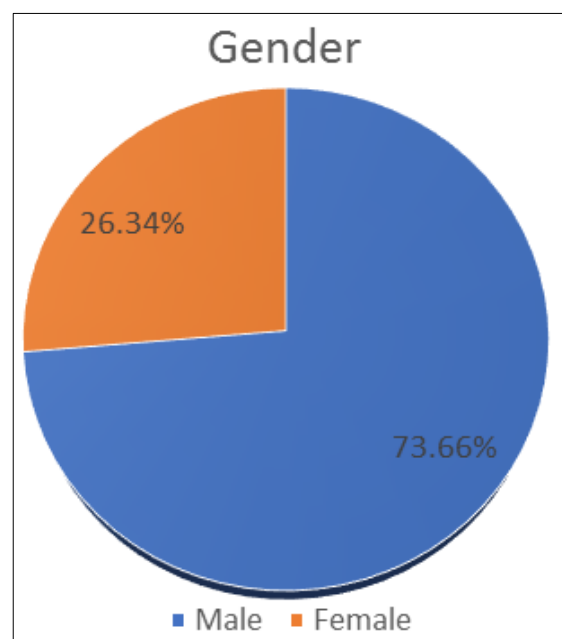


Fig 2: Distribution of patients according to sex (n=186)

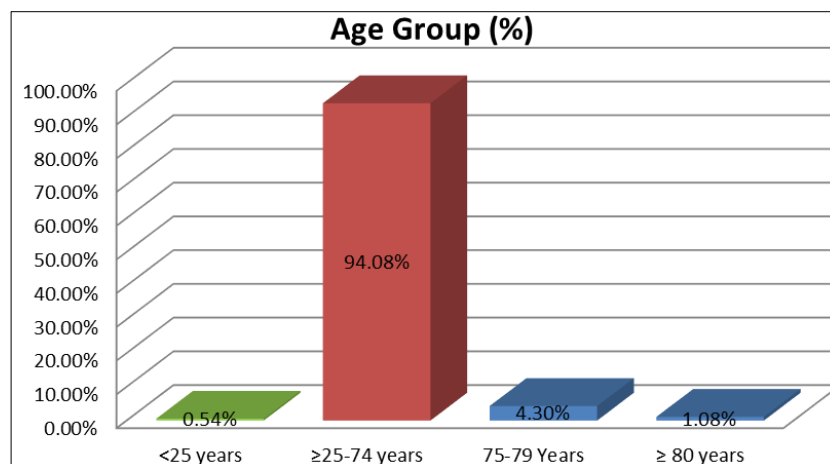


Fig 3: Distribution of patients with age group (n=186)

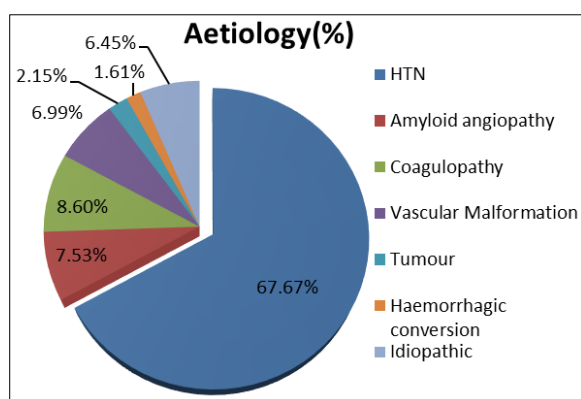


Fig 4: Distribution of different Aetiological factors of spontaneous ICH (n=186)

Discussion

Spontaneous intracerebral haemorrhage in advancing age is more vulnerable as blood pressure raised, but persistent raising blood pressure with age or not is still enigmatic.

In this study we have noticed that male were 137(73.66%) and female were 49(26.34%) patients and male is predominant.

In 2015; Jolink *et al.* [12], showed that annual incidence of spontaneous ICH per 100,000 populations, men were higher than women; which correlates with this study.

Amir *et al.* [13], in 2022 conveyed that the aetiology of spontaneous ICH: Primary- mostly HTN then Amyloid angiopathy, Secondary- (less common) Coagulopathy, Vascular Malformation, Tumour, Haemorrhagic conversion of ischemic stroke, Idiopathic and most common was HTN 65.13%. In this study HTN 124(66.67%), Coagulopathy 16(8.60%), Amyloid angiopathy 14(7.53%), Vascular Malformation 13(6.99%), Tumour 4(2.15%), Haemorrhagic conversion of ischemic stroke 3(1.61%), Idiopathic 12(6.45%); and mostly HTN 66.67% patients, which correlates with the study of Amir *et al.* (Fig-4).

Roditis *et al.* [14], in 2011 showed that spontaneous ICH in young people below 35 years is 0.5/100 000. In our study we found that <25 years only 1(.54%), which almost correlates with Roditis *et al.*, study.

In a study by Stein *et al.* [15], in 2012 expressed that affected ICH; 80 years and above were 34% patients.

In another study of Statpearls illustrated that incidence of ICH increases after 55 years of age but relatively lesser risk above 70 years of age [16].

In our study, we have seen that ≥25 – 74 years 175(94.08%), 75-79 years 8(4.30%) and ≥80 years 2(1.08%); so very old age group affected only 1.08% of study population which almost correlates with Statpearls study.

Pathophysiologically; elasticity of vascular wall is enough to cope up extra blood pressure in young age but not in adult due to harden vascular wall specially due to deposition of cholesterol and resulting disruption of vessels. But in very old age decrease sympathetic stimulation as well as reduction of vascular tone (although some cholesterol deposition and loss of elastin in vascular wall but is negligible) followed by reduction of blood pressure as well as depletion of haemorrhagic stroke. Middle to old aged people mainly suffered from HTN, hypercholesteremia with having anti-platelet and anti-coagulant drugs are more prone to spontaneous ICH than young & very old age group is observed in our study.

The limitation of this study is that it was done in a single center. Although the patients we included in our study; both serving, retired soldiers and parents of soldiers live in different area of the country and reported to CMH Dhaka which reflects to some extent overall scenario at least Bangladesh.

Conclusion

Spontaneous ICH mostly affected in adult male population. Hypertension is the main culprit. Very old age is subjected to lessen sympathetic stimulation as well as reduction blood pressure and bring down vulnerability of spontaneous ICH.

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