



## Chronic subdural haematoma- A dilemma of most common aetiological factor

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### Abstract

**Background:** Chronic subdural haematoma (CSDH) is common of all intracranial haemorrhages specially in old age. Mortality is still 13% after invention of simplest and latest technique including operation. Incidence of CSDHs in over 65 years is 58.1 per 100,000 per year but only 3.4 per 100,000 per year in those under 65 years of age. So, age has a great role inducing CSDH, there is also chance of intracranial haemorrhage on anti-platelet & anticoagulant drugs, platelet & coagulation dysfunction. Major trauma to head produces acute haematoma but minor trauma should take into cognizance for CSDH. The purpose of this study was to take details history, analysis of patients to find out aetiological factors of chronic subdural haematoma and to take precautions regarding them specially most one to avoid preventable morbidity and mortality.

**Materials and Method:** This prospective study was carried out in Combined Military Hospital (CMH), Dhaka from March 2018 to March 2019. All of our patients above 20 years of age; were admitted and diagnosed clinically and confirmed by CT scan head as CSDHs. Total number of patients were 50; randomly allocated and sampling was done as per inclusion and exclusion criteria. Elaboration of details history, through examination including neurological examination, meticulous investigations including CT scan of head was done. Statistical analyses were performed by using the Statistical Package for Social Sciences version 26 for Windows (SPSS).

**Results:** In our study 50 cases were finally selected as CSDHs and diagnosed clinically then confirmed radiologically. The most of the patients 39 (78%), 51-80 years age group, male were 41(82%) and female were 9(18%) in number. In this study, it was observed that unknown aetiology 7(14%), on anti-platelet drug 10(20%), on anti-coagulant drug 6(12%) and 27(54%) subjects had trivial head trauma. Explored aetiology; trivial head trauma, on anti-coagulant and anti-platelet medication were 43(86%) in number.

**Conclusion:** Diagnosis of CSDH is relatively easier than to find out aetiology. We should cautious about the causative factors specially most common like trivial head trauma in old age & keen observe them and avoid coagulopathic medication if not essential.

**Keywords:** chronic subdural haematoma, trivial head trauma, coagulopathic medication

### Introduction

Chronic subdural haematoma (CSDH) is one of the commonest intracranial haemorrhages mainly affecting the elderly people [1]. Slowly progressive accumulation of blood within the subdural space and manifestation develops by days to weeks after initial event usually headache without neurological deficit [2]. It is one of the major causes of morbidity even mortality, although it can be treated by mostly simple technique & the majority of patients improve rapidly following surgical intervention.

Virchow in 1857 first described chronic subdural haematoma. Later on, Trotter illustrates-trauma/torn to bridging vein as its aetiology. Chronic SDH is engine oil like liquefied blood products with neo-membrane in between potential space arachnoid and dura mater.

The pathophysiology behind the maintenance of the chronic state of CSDH is still poorly understood, but as subdural space is not well equipped to reabsorb; can ensue haematoma. Accumulated blood in this potential space, provoke an inflammatory reaction resulting in enveloping membrane surrounding the haematoma. Few days later of haemorrhage, the outer surface of haematoma is covered by a thin layer of fibroblasts and fibrin. And with migration and

proliferation of the fibroblast leads to formation of a membrane over the clot. The outer membrane progressively enlarges and subsequently fibroblasts invade the haematoma and form a thin inner membrane following two weeks. Liquefaction of haematoma takes place by fibrinolysis. Then the liquefied haematoma either resorb spontaneously or slowly increase in size resulting CSDH [3].

There are three major theories to explain the growth of a chronic subdural haematoma...

Osmotic theory- liquefaction of haematoma increases the protein content and oncotic pressure within the encapsulated space and attracts fluid from the neighboring vessels due to osmotic pressure gradient across the semi-permeable membrane (haematoma capsule).

Neocapillaries growing inside the neomembrane are fragile leads to repeated microhemorrhage into the subdural space and subsequently expansion of the hematoma.

Inflammation by haematoma leads to VEGF and profibrinolytic factors production that induce SDH growth [4].

Chronic SDH can be bilateral or unilateral; but mostly unilateral only in 20-25% cases CSDHs are bilateral. Thickness of haematoma tends to be larger in old age group

due to decrease in brain weight, volume and increase subdural space with age [3].

It may happen that patient had history of trivial head trauma which may be repeated but forgotten. Without obvious association with head trauma, other factors such as intracranial hypotension, defective coagulations may responsible for CSDHs [5].

Common clinical presentations; minor symptoms like headache, language difficulties, altered mental state, TIA-like symptom even may also develop coma, hemiplegia or seizure [3].

Rare atypical presentations are isolated neurological deficit, nystagmus, vertigo, upward gaze palsy and isolated oculomotor palsy in CSDHs [6].

The CT of the skull is harmless and most effective diagnostic tool for detecting Chronic SDH.

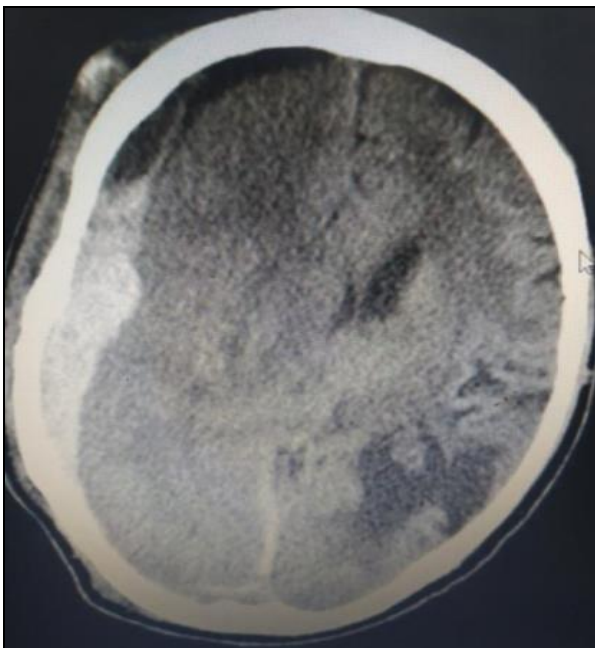


Fig 1: Chronic Subdural Haematoma (Rt)

**Aetio-pathogenesis:** Blood vessels specially vein that connects the cortical surface of the brain to dural venous sinus is termed as bridging vein. In old age the bridging veins are more prone to torn in minor trauma (as already being stretched and high volume of potential subdural space because of the brain atrophy [3].

Coagulopathy or anticoagulation medicine like warfarin, heparin, chronic liver disease (CLD), hemophilia, thrombocytopenia induce blood thinning & easy to bleed and difficult to haemostasis. Meningioma or dural metastases may produce intracranial haematoma.

Intracranial hypotension due to lumbar puncture, lumbo-peritoneal shunt or spinal epidural anesthesia -are potential to generate chronic subdural haematoma [7].

Incidence of CSDH is overall 13.1 per 100,000 per year, in those aged over 65 years is 58.1 per 100,000 per year compared to 3.4 per 100,000 per year in those under age of 65[8].

Male is predominant and high percentages in old age. It is increasing substantially between 2000-2030 and expected more than double worldwide specially Asia and Latin America between years 2000 and 2030 of CSDHs [9].

There is significant improvement achieved for better understanding of pathophysiology, introducing modern

imaging and refinements of operative technique but mortality rate is still 13% [10]. And still aetiopathology specially most common one is in ambiguous.

In this background to come into conclusion we tried to explore all aetiological factors prone to CSDHs; and to be cautious along with proceeding necessary measures to prevent as much as possible of being CSDHs to reduce morbidity and casualty.

**Materials & Method**

This prospective study was performed in the Neurosurgery dept. CMH Dhaka, Bangladesh from March 2018 to March 2019. Age, above 20 years who all were admitted; diagnosed clinically and radiologically as a case of CSDH. Total 50 patients in either sex and age variables were randomly selected. Sampling was done as per inclusion and exclusion criteria but without radiological positive findings is not included in this study.

Informed written consent and data collection sheet prepared with relevant information from hospital record, communication system and picture archive. Details history, meticulous physical examination including neurological examination finally CSDHs confirmed by CT scan-head.

History including any repeated fall, past medical history, medication, coagulopathy, surgical history was taken meticulously.

Statistical analyses were performed by using the SPSS version 26. Mean values were calculated from continuous variables and quantitative observations of frequencies and percentages. The results of the study were presented in pie chart & tables.

**Results**

In this study 50 CSDHs patients were finally selected. All cases were evaluated thoroughly including details history-age, sex, medication, any fall on the ground, past medical history, coagulopathy & surgical history.

In this study, distribution of cases according to gender male were 41 and female were 9 in number (Figure 2).

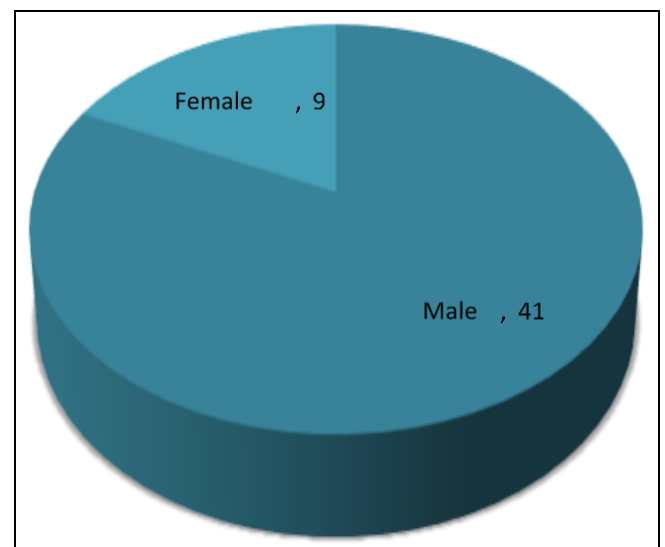


Fig 2: Distribution of patients in accordance with Gender (n=50)

Regarding age group; it was observed that most of the patients 39 (78%), 51-80 years age group; a smaller number of patients 6 (12%) were 21-50 years & above 80 years age 5(10%) in number (Table I).

In this study subjects, it was observed that 27(54%) subjects had trivial head trauma, on anti-platelet drug 10(20%), anti-coagulant medication 6(12%), idiopathic 7(14%) and trivial head trauma, on anti-platelet & anti-coagulant medication accumulately 43(86%) in number of CSDHs patients (Table II).

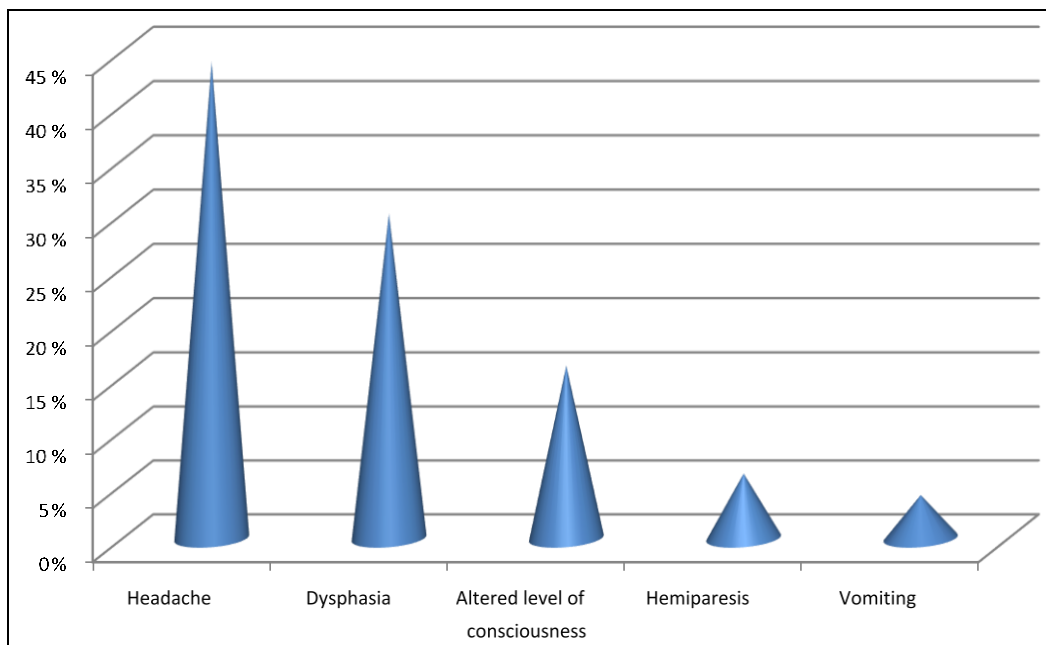
Clinical illustration of CSDH in our study group, it was observed that mostly headache 22(44%) and less number of patients only 2 (4%) patients had vomiting (Figure-3)

**Table 1:** Distribution of patients according to age group (n=50)

Age (years)	(n=50)	(%)
21 – 30	1	2
31 – 40	2	4
41 – 50	3	6
51 – 60	9	18
61 – 70	18	36
71 – 80	12	24
81 – 90	5	10
Range (min, max)	28, 90	

**Table 2:** Distribution of the study patients according to Aetiology of CSDH (n=50)

Category	(n=50)	(%)
Trivial head trauma	27	54
Past medical history (CLD, Haemophilia, Thrombocytopenia etc.)	Nil	0
Anti-platelet drug	10	20
Anti-coagulant drug	6	12
Surgical history (LP shunt/lumber puncture)	Nil	0
Idiopathic	7	14



**Fig 3:** Distribution of patients in accordance with Clinical manifestation (n=50)

**Discussion**

Chronic subdural haematoma is one of the common neurosurgical problems day to day facing by neurosurgeon. The patients with CSDHs, who require definitely surgery without operative procedure, have higher morbidity and mortality. Chronic subdural haematoma is one of common neurosurgical emergency which makes the neurosurgeon worried. Without knowing aetiology & diagnosis, failure of proper treatment specially surgical treatment has higher morbidity and mortality. The Simple operative technique has very significant outcome.

In developed countries in time reporting, proper evaluation, improved radiological facilities contribute early diagnosis that helps to treat properly as soon as possible. But in developing country like us, output is not satisfactory due to negligence of minor head trauma, improper and irregular utilization of anti-coagulant specially anti-platelet drug (aspirin) without periodic follow-up, lack of neurosurgical center & neurosurgeons specially periphery.

Hence, we like to search the causative factors of CSDHs specially significant one to be cautious to restrain. We performed this study in Neurosurgery dept. at Combined Military Hospital, Dhaka, Bangladesh during the period of March 2018 to March 2019 with history elaborately.

In this study, 50 consecutive patients of CSDHs were selected and all of them CT scan proved and fulfill other criteria.

In our study, males were predominant. Female were only 9(18%) and more than four-fifth 41(82%) patients were male & the male-female ratio was 4.56:1.

Sambasivan *et al.* [11], in a relevant study, found male-female ratio 5:1 which correlates with our study.

In this study; most of the patients 39 (78%), 51-80 years age group; less number of cases 6 (12%) were 21-50 years and 5(10%) in number above 80 years of age.

In an international study, above 60 years of age CSDHs was found 73% by Ernestus *et al.* [12], which almost correlates with our study.

Fall on the ground leads to minor head injury in frail elderly patient, is common and associated with CSDHs. In this study series, 27(54%) patients had trivial head trauma. In 2004, Lee *et al.* [13], showed 66% patients had history of head trauma which almost correlates with this study.

Regarding aetiology; patient on anti-coagulant, anti-platelet medication and trivial head trauma in this study series 43(86%) subjects. Patients with 89.5% had head trauma (direct or indirect) due to fall of anti-prothrombotic drug consumer shown by Asghar *et al.* [14], which correlates with our study.

We all know “prevention is better than cure”, specially intervention of head is weird. We have observed in this study that in old age shrinkage of brain produce stretch bridging vein with increasing subdural potential space leads to torn said vein even in minor head injury. And if it is related with coagulopathy more prone to develop chronic subdural haematoma. In each and everywhere like this country, CT scan is not available and intervention is costly and even life threatening but gathering knowledge regarding the aetiopathology can help us to prevent incidence.

In this study, there are some limitations - it was done in a single center, CMH Dhaka, Bangladesh, short duration of study & less number of cases. But patients; those who are entitled, live different parts of the country and report to our last echelon CMH Dhaka which reflects some overall scenario of Bangladesh.

### Conclusion

Most of our population including some general physician is ignorant about the aetiology of CSDH; but it is not uncommon of all intracranial haemorrhages. Trivial head trauma is commonest one. Symptomatic trivial head trauma in old age (may be with coagulation disorder) should to be warned and early visit to neurosurgeon to take a well-timed measure.

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