



## Clinical triad of chronic subdural haematoma

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### Abstract

**Background:** Chronic subdural haematoma (CSDH) is one of the common intracranial haemorrhages mostly affecting the elderly population. It has a great role in morbidity and mortality, yet it is treatable by relatively simple technique and the majority of patients improve rapidly following surgical intervention but mortality rate is still 13%. The incidence of CSDHs in over 65 years is 58.1 per 100,000 per year compared to 3.4 per 100,000 per year in those under 65 years of age. Most of the population in developing country like Bangladesh resides in rural area; and there is less opportunity to do Computed Tomography (CT) scan brain. So better to diagnose clinically and then confirmed by CT scan to provide necessary treatment timely to reduce suffering of the patient. The purpose of this present study was to take details history, analysis symptoms and meticulous examination to diagnose CSDHs clinically, so that further CT scan of very diagnostic cases could be done to treat properly.

**Materials and Method:** This study was conducted in the Department of Combined Military Hospital (CMH), Dhaka from March 2018 to February 2019 and it is a prospective study. The patients more than 20 years who were admitted and diagnosed clinically and all confirmed as CSDH by non-contrast CT scan head. A total 50 patients randomly allocated and sampling was done as per inclusion and exclusion criteria but must exclude who were not CT scan positive findings. Details history, meticulous symptom imprinting, keen physical examination including neurological examination and finally data collection with CT scan-head was done. Statistical analyses were carried out by using the Statistical Package for Social Sciences version 26 for Windows (SPSS).

**Results:** In this study 50 cases were finally selected as 'Chronic Subdural Haematoma' and all were diagnosed clinically and radiologically confirmed. It was observed that most of the patients 39 (78%), 51-80 years age group. Regarding distribution of gender male were 41 & female were 9 in number. In our study subjects, it was noticed that 43(86%) subjects had trivial head trauma, on anti-platelet and anti-coagulant medication. Regarding clinical picture of these CSDHs, it was observed that less number of patients only 5 (10%) patients had hemiparesis & vomiting but 45(90%) subjects had Headache, Dysphasia and Altered level of consciousness.

**Conclusion:** Diagnosis of CSDH by details history and meticulous clinical tests is easily accessible, less costly and effective in dubious mass population. Much suspected cases by clinical means can be confirmed by CT scan head and at least on time treatment could reduce morbidity as well as mortality of developing to poor country.

**Keywords:** chronic subdural haematoma, clinical triad

### Introduction

Chronic subdural haematoma (CSDH) is liquefied haematoma within the subdural space which is at least three weeks after head injury<sup>[1]</sup>.

It is one of the common intracranial haemorrhages mainly affecting the elderly population<sup>[2]</sup>.

CSDH has been recognized since 1857 by Virchow. Later Trotter forwarded the theory of trauma/torn to bridging vein as aetiology and named as "subdural cyst".

This haematoma is slowly progressive accumulation of liquefied blood within the subdural space and symptom develops by days to weeks after initial event and the most common symptom of CSDH is mild headache without obvious neurological deficit<sup>[3]</sup>.

One of the major causes of morbidity and mortality is CSDH, though it is treatable by relatively simple technique & the majority of patients improve rapidly following surgical intervention.

Regarding pathogenesis of chronic subdural haematoma

usually it consists of engine oil like liquefied blood products associated with neomembrane in between potential space dura and arachnoid mater. The exact mechanism behind the maintenance of the chronic state of CSDH is still poorly understood, but the hypothesis is that subdural space is not well equipped to reabsorb the ensuing haematoma. Blood within this potential space provoke inflammatory reaction resulting enveloping membrane surrounding the haematoma.

The outer surface of haematoma is covered by a thin layer of fibrin and fibroblasts following haematoma formation. Migration and proliferation of the fibroblast leads to formation of an outer membrane of clot. The outer membrane progressed; fibroblasts invade the haematoma and form a thin membrane during the next two weeks. Haematoma is liquefied by fibrinolysis. This haematoma may either resorb spontaneously or slowly increase in size resulting in a CSDH<sup>[4]</sup>.

Proposed explanation of growth of a CSDH are i.

Intracapsular haematoma oncotic pressure ii. Oozing from fragile neocapillary of membrane iii. VEGF & profibrinolytic factors of inflammation; leads to liquefaction as well as haematoma volume expansion [5].

CSDHs mostly happens with patient having history of trivial head trauma but forgotten. It can also materialize even without obvious association with head trauma; other aetiological factors to be considered such as intracranial hypotension and defective coagulations [6].

Most common presentations: Patient usually expressed with minor symptoms like headache, altered mental state, language difficulties, TIA-like symptom; they may also develop coma, hemiplegia or seizure [4].

Uncommon presentations: Isolated neurological deficit. Patient may presents with vertigo, upward gaze palsy, nystagmus and isolated oculomotor palsy [7].

The incidence of CSDH is 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 65 [8].

Relatively high percentages of elder population substantially increasing between 2000-2030 and expected more than double worldwide specially Asia and Latin America between years 2000 and 2030 [9].

Although CT of the skull is most effective ( Figure 1) and harmless diagnostic tool for detecting Chronic SDH but there is less facilities in the third world countries even developing countries specially rural area.

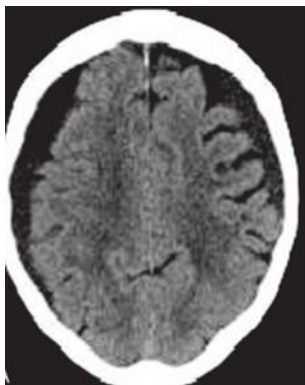


Fig 1: Bilateral CDSH

Over past 150 years, a dramatic improvement in outcome was achieved due to better understanding of pathophysiology, introducing modern imaging and refinements of operative technique but mortality rate is still 13%, reported in contemporary literature and is much higher if diagnosis as well as treatment is not introduced in time [10]. Regarding diagnosis; 80% could be achieved by history and clinical examination in almost all diseases.

Most of our patients residing rural area and there is no facilities of CT scan; so morbidity and mortality is increasing due to less suspicion of chronic subdural haematoma clinically and could not be referred to higher echelon for further investigation and treatment.

In this background to come into conclusion we tried to diagnose chronic subdural haematoma clinically so that we can help our people from risk of casualties providing treatment at least on time.

**Materials and Method**

This is a prospective study which carried out in the Department of Neurosurgery, CMH Dhaka, Bangladesh

from March 2018 to February 2019. Age of the patients was above 20 years who all were admitted and diagnosed clinically as a case of CSDH. A total 50 patients in either age or sex variables were randomly selected. Sampling of the patients was done as per inclusion and exclusion criteria but without CT scan positive findings; not included in this study. Informed written consent was prepared and data collection sheet completed with relevant information from hospital record, picture archive and communication system. Diagnosis was done by details history, symptom of patients, meticulous physical examination including neurological examination finally confirmed by CT scan-head. Statistical analyses were done by using the SPSS version 26. The mean values were calculated from continuous variables and quantitative observations demonstrated by frequencies and percentages. All cases were analysis properly. Results of the study were presented in tables and pie chart.

**Results**

In our prospective study 50 cases were finally selected as diagnosis is confirmed as ‘Chronic Subdural Haematoma’. All patients were evaluated thoroughly including detail history (age, sex, medication due to co-morbidities), clinical symptoms and physical findings including neurological examinations. All were positive CT scan for CSDH. In our study distribution of patients according to gender male were 41 & female were 9 in number shown in Figure 2.

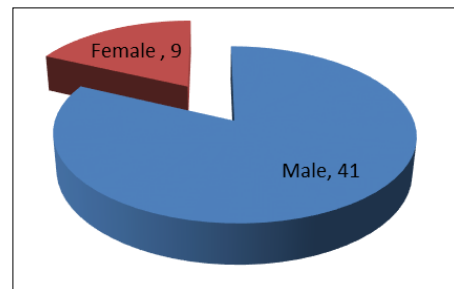


Fig 2: Distribution of patients according to Gender (n=50)

Regarding age group It was observed that less number of patients 11 (22%) were 21-50 years & above 70 years age group; whereas most of the patients 39 (78%), 51-80 years age group; summarized in Table I. In our study subjects, it was noticed that is 43(86%) subjects had trivial head trauma, on anti-platelet and anti-coagulant medication but minor number of patients have unknown aetiology of CSDHs 17 (14%); shown in Table II. Regarding clinical manifestation of CSDH in this study group, it was observed that less number of patients only 5 (10%) patients had hemiparesis & vomiting but 45(90%) subjects had Headache, Dysphasia and Altered level of Consciousness; illustrated in Table III.

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=5)	(%)
Trivial head trauma	27	54
Anti-platelet drug	10	20
Anti-coagulant drug	6	12
Nil	7	14

**Table 3:** Distribution of patients according to Clinical manifestation (n=50)

Clinical presentation	(n=50)	(%)
Headache	22	44
Dysphasia	15	30
Altered level of consciousness	8	16
Hemiparesis	3	6
Vomiting	2	4

## Discussion

Chronic subdural haematoma is one of common the neurosurgical emergency which makes the neurosurgeons worried. Without diagnosis and failure of proper treatment specially surgical treatment has higher morbidity and mortality. Simple operation of CSDH is very significant outcome.

In advanced countries, proper evaluation, rapid evacuation, emergency medical services and improved imaging facilities contribute significantly better (operative) outcome of CSDHs. But in our country, output is not satisfactory due to lack of neurosurgical center and neurosurgeons specially periphery, poverty, ignorance and lack of advanced transport facilities.

Most of our population lives in periphery-rural area; although least Neurosurgeon is there but a lot of registered physician available at least Upzilla complex. There are emerging idea and thoughts regarding clinical diagnosis of chronic subdural haematoma; that can be done by any registered doctors.

Hence we like to search the significant clinical tools of CSDHs to identify most probable cases; so that we can refer that narrow volume of patients to higher echelon for CT scan of brain to confirm diagnosis followed by proper treatment in time. And we carried out this study in the Dept. of Neurosurgery, in Combined Military Hospital, Dhaka, Bangladesh during the period of March 2018 to February 2019 with details history, relevant symptoms and keen examination including neurology.

In our study, 50 consecutive patients of CSDH were selected, who all are CT proved positive cases and fulfill the other criteria.

In this study, 11 (22%) patients were 21-50 years with above 80 years age group and mostly affected age range is the 39 (78 %) subjects belonged to age 51-80 years; interestingly only 61-70 years age group is 18(36%). In relevant international studies, above 60 years of age CSDHs was found 73% by Ernestus et al <sup>[11]</sup>, which almost correlates with this study.

In this study, there was male predominance. More than four-fifth 41(82%) were male and female were only 9(18%). The male-female ratio was 4.56:1. Sambasivan et al.<sup>[12]</sup>, in a relevant study, found male-female ratio 5:1 which correlates with our study.

Direct head trauma or other domestic incidence leading to minor head trauma in a frail elderly patient, is common association with a history of CSDHs. In our series 27(54%)

patients had head trauma. Lee et al.<sup>[13]</sup>, showed 66% patients had a history of head trauma which almost correlates with our study.

And trivial head trauma, Anti-coagulant & anti-platelet medication consuming patients in this series 43(86%) subjects. Asghar et al. <sup>[14]</sup>, showed 89.5% patients had head trauma (direct or indirect) due to fall, anti-prothrombotic drug consumer, which correlates with our study.

According to Luxon et al. <sup>[15]</sup>, headache is in 77% patients as an initial symptom.

But in our study only headache is main symptom of CSDH and is 22(44%) patients; and Headache, Dysphasia with Altered level of Consciousness is 45(90%) subjects. Kim et al.<sup>[16]</sup>, showed 92.1% patients had Headache, Dysphasia with Altered level of consciousness, which correlates with our study.

Actually, clinical diagnosis of CSDH by single history, particular symptom and sole examinations not statistically significant in many aspects but integrated history, clinical symptoms with more relevant findings may be inform of triad is preferable. This method is simpler procedure, less expert required, both in urban & rural area can be implemented, less time-consuming, less referral subjects, cost effective associated with favorable outcome (although CT is for confirmation) specially developing to poor countries.

In our study, there are some limitations - it was done in a single center, CMH Dhaka, Bangladesh, less number of Patients and short duration of study. But as our patients are entitled both serving, retired soldiers, parents of our military members even some VVIPs live different parts of the country and reported to our last echelon CMH Dhaka which reflects overall scenario of Bangladesh.

## Conclusion

CSDH is common in the world. Most of the population resides in rural area where neuro-expert and CT scan is less available rather than registered physician. They can predict clinically by triad of age duration 3(10s), trivial trauma with anti-platelet & anti-coagulant medicinal aetiology and objective headache, dysphasia with altered consciousness. Most predictive subjects but less in number can get access to higher center for CT scan and proper treatment to reduce morbidity and mortality of developing to poor country.

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