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Research Article

Age comparative study of chronic sub dural hematoma and its outcome :- A retrospective study

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Abstract:

Objective:-Chronic subdural hematoma (CSDH) is a common disease among the elderly and with increasing incidence in the younger population, we have chosen to focus on CSDH in the different age groups so we can differentiate between presentation and radiological finding and etiological factor in each groups.

Methods :-We conducted a retrospective review of 196 patients undergoing surgery for CSDH over a period of five years (2011–2016). Risk factors such as age, head trauma, anticoagulant and/or antiplatelet agent therapy and co-morbidity were investigated along with gender, laterality, surgical method and recurrence. We divided our patient in four groups according to age.

Results:-Seventy-two percent of the patients were male and the mean age was 70% years (range 2–92 years). Headache was the most common symptom of presentation (63%). Maximum numbers of patients were found in the age group 61-75 years 74(38%) . Association of head trauma in each group is the main etiological factor. CSDH is associated with brain atrophy in elderly and older age group.

Conclusion :-Recurrence and bilateral disease are more common in old age group .Trauma to head is most common etiological factor in each age group .brain atrophy is etiological factor associated with old age group . Antiplatelet or anticoagulant therapy is associated as risk factor for the CSDH in all age groups.The use of antiplatelet or anticoagulant should be restricted to truly indicated patients.

Key words: Chronic subdural hematoma Anticoagulants Antiplatelet agents Head trauma

Introduction:

Chronic subdural hematoma (cSDH) is one of the most frequent neurosurgical entities caused by head trauma.[1] Since cSDH affects mainly elderly patients and the population continues to age, it has become a common neurosurgical disease seen by both general and specialized health-care practitioners.[2,3] Incidence of CSDH has been increasing in younger patients as a result of several clinical trends that increase bleeding risk including increase use of anticoagulant therapy and hemodialysis and longer survival with the systemic hematological disease.[4,5]

Incidence is about 5 per 100000 per year in the general population. Because the proportion of people aged 65 years and older is expected to double worldwide between 2000 and 2030,[2,4,5] a large rise in incidence is expected. Despite the benign nature of CSDH re accumulation of hematoma is still a matter of concern, and disease progression can be fatal without timely surgical intervention, nevertheless early diagnosis and proper treatment result in complete recovery in most cases.[3,6]

Although most clinicians focus on elderly in majority of studies, CSDH in young population is not rare in neurosurgical practice. Whether the younger population differs from the elderly in clinical manifestation or significance has not been clarified so far.[4, 5]

Therefore, in the present study, we retrospectively analyzed symptomatic presentation, neurological grading, imaging findings, and surgical outcomes in patients with CSDH, and attempt to identify the differences in clinical details between different age groups.

Method:-

This is single institutional retrospective descriptive study involving patient admitted under neurosurgical department in the duration of January 2011 to November 2016 .A total 196

patients were admitted and burr hole evacuation of CSDH as surgical procedure were performed including recurrent cases during study period and patients enrolled in the study after gaining the approval from the institutional ethical committee. Medical records and radiological finding were reviewed retrospectively. Demographic factor, head trauma history, underlying morbidity, taking of antiplatelets and other etiological factor comparison were made among each groups.

We divided the patients into four groups according to the age. Comparisons were made among each group. first group having less than45 years (A-YOUNG),second group from 46to 60 years (B-MIDDLE AGE),third group 61 to 75 years (C-OLDER),fourth group 75 years above (D- ELDERLY).

Qualitative variables were compared using chii square test. Also we compare between young + middle age (A+B) vs. old +elderly (C+D) Therapy, radiological finding, brain atrophy, bilateral disease, recurrence of disease studied. The data was analyzed using SPSS software (v16, IBM, NY, USA). Qualitative variables were compared using Chi-square test. Statistical significance was set at P <0.05.

RESULTS:- Total 196 patients were admitted with CSDH and underwent burr hole and evacuation of CSDH. The youngest age of presentation was 1 ½ year with haematological disorder and oldest age of presentation was 92 years. Median age of presentation of CSDH in this study was around 66 years. Over all, there was male predominance, males 139(70%), females were 57(30%).(table 1 and 2)

Table 1. Symptoms of CSDH

symptoms	Number of patient	Percentage
headache	123	63
Vomiting	49	25
Limb weakness	107	54
vertigo	17	8.7
Blurring of vision	2	1
Gait disturbance	113	57
Slurring of speech	16	8.2
Altered sensorium	54	28
Urinary and fecal incontinence	25	13
Bilateral disease	2	4.1
Recurrence	11	5
Tension pneumocephalus	2	1.1
Death	1	0.5
Wound infection	2	1.1

The clinical presentation of CSDH in overall patient were studied ,in which we found that headache was the most common symptom of presentation (63%)followed by gait disturbances, (57%),limb weakness , memory disturbances and speech impairment. The comparison among the 4 age groups were done ,showing maximum no of patient were found in the age group 61-75 years 74(38%) and male predominance of disease was found . Head ache was the most common presentation in all groups. Gait disturbances, limb weakness altered consciousness were found mostly in elderly and older group of patient. Memory disturbances was found more in elderly age group ,speech impairment more in elderly age group and altered consciousness also common in elderly age group. In young age patients we found that headache was the most common presenting complaint. (Table 2)

TABLE 2. Comparison of clinical presentation

Total patient	<45	46-60	61-75	>75	P Value
	18(9%)	53(27%)	74(38%)	50(26%)	
Headache	13(72%)	35(66%)	43(58%)	32(64%)	0.648
Gait disturbances	11(61%	31((58%)	37(50%)	34(68%)	0.254
Limbs weakness	5(27.5%)	27(50.5%)	42(57%)	33(66%	0.041
Memory disturbances	4(22%)	11(21%)	18(24%)	14(28%)	0.855
Speech disturbances	2(11%)	4(7%)	11(15%)	14(28%)	0.035
Altered sensorium	6(33%)	19(36%)	20(27%)	22(44%)	0.274

Comparison of CT SCAN finding according to the age groups:- (Table 3)

TABLE 3 :-Comparison of the radiological findings

Total patient	<45	46-60	61-75	>75	P Value
Bilateral	2(11%)	8(15%)	10(13%)	15(30%)	0.079
Brain atrophy	0	3(5%)	66(89%)	47(94%)	0.0001
Maximum thickness	1.6+/- 0.3	2.8 +/- 1.1	3.1+/- 0.5	3.2+/- 1.6	
Density on CT	4-9-5	17-12-21	19-17-38	7-11-32	
Hypo	4(22%)	17(32%)	19(25%)	7(14%)	
Iso	9(50%)	12(23%)	17(23%)	11(22%)	
Mix	5(28%)	21(55%)	38(52%)	32(64%)	

Bilateral disease was found most commonly in elder age group and older age group patients. Brain atrophy also found to be more on elderly and older age group patients. Thickness of CSDH was more in elderly group of patients. Younger age group patient presented with more of iso density on CT scan. Older age group patients presented more of mixed density with multiple layering on CT scan .

Comparison between the etiological factor in all age groups:-(Table 4)

TABLE 4. Comparison between etiological factors

	<45(A)	46-60(B)	61-75(C)	>75(D)	P1 Value A vs B vs C vs D	P2 Value A+B vs C+D
Total	18(9%)	53(27%)	74(38%)	50(26%)		
Female	6(33%)	14(26%)	14(18%)	23(46%)	0.039	0.805
Trauma	11(61%)	34(64%)	48(64%)	42(84%)	0.072	0.0042
Brain atrophy	0(0%)	3(5%)	66(29%)	47(94%)	0.001	0.0001
Bilateral disease	2(11%)	2(15%)	10(13%)	15(30%)	0.079	0.287
Drugs	7	24(45%)	40(54%)	29(58%)	0.093	0.101
Recurrence	0	2(3%)	6(12%)	3(6%)	.5	0.196

There was male predominance of disease. Association of head trauma in each group is the main etiological factor with statically significance also . CSDH is associated with brain atrophy in elderly and older age group patient which was statically significant also. When antiplatelet and anticoagulant therapy was the etiological factor, incidence was increased in younger population but our study did not reveal the statistically significant association. Bilateral disease was more in elder and older age group patients. Recurrence of disease was more in the older age group patients.

Outcome of the CSDH in our study showed that patients were showing improvement in the symptoms .We found recurrence of disease more in elderly age group patient (5%) which required re exploration and second burr hole evacuation. Only one patient we required decompresssive craniectomy. The wound infection rate was 0.5%, we found that the tension pneumocephalus was found in only one patient for that we did reexploation and saline wash was given. Only one 83 year old patient died in our study during hospital stay after surgery. (Table 1)

DISCUSSION:-

CSDH is nowadays considered to be a benign entity. CSDH is principally a disease of the elderly in whom physiological brain atrophy, frequent head trauma and several coagulopathic diseases are present.[7] Miranda et al found that the overall mortality rates at 6 months and 1 year were 26.3% and 32%, respectively, and concluded that CSDH in the elderly may not be a benign disease[8]. Hence, the impact of age on the clinical manifestation and prognosis of CSDH should receive attention. As expected, the younger patients have fewer medical illnesses, such as hypertension, diabetes mellitus, stroke, or the requirement for antiplatelet therapy.[6] By contrast, among patients with a prior head injury, the younger adults are often involved in violent motor vehicle accidents rather than trivial fall accidents. Despite these differences in predisposition in our series, the neurological state at admission, including the GCS score and Markwalder grade, did not differ between the four age groups. Current trends including liberal use of antiplatelets and anticoagulants, as well as longer life span due to well controlled medical diseases such as liver cirrhosis, hematologic malignancy and alcoholism yield higher prevalence of CSDH, especially in young patients.[6, 8]

Hence our study highlights several clinical and radiological differences between the younger and older population of CSDH .We had divided our patient into 4 groups according to the age basis and comparative study was done on the basis of clinical finding and radiological findings.

In this study young group of patients presented with headache as the most common presenting symptom as compared to other groups, other symptoms like gait disturbances, limb weakness, speech impairment has less incidence in young group of patient. As compared to young group patients, older patients also presented with headache as the main symptoms but older patients have more incidences of gait disturbances and limb weakness and altered sensorium as presenting symptoms.[9] This due to the brain weight decrease as age progressed and space between the brain parenchyma and skull increase from 6% to 11%of total intracranial space, late detection can lead to more severe neurological deficit in older age patient[10]. Elderly patient with dementia slow progressive neurological disease seldom visit to hospital early in course of the disease because of indefinite symptoms progression. Elderly patients can endure a larger volume of hematoma collecting in subdural space before experiencing clinical symptoms.[10] Young adult have less intra cranial capacity to allow hematoma expansion and deep cerebral distortion without increase in intracranial pressure, that's why young adult most commonly presented with headache as the presenting symptoms.[11](table 2)

Fogelholm et al observed that younger patients had more evidence of increased intracranial pressure, and older patients had more evidence of mental deterioration and pyramidal tract lesions.[12] The same presentations were documented in other studies.[9,10] In our investigation, hemiparesis occurred in 38% of younger CSDH patients and 60% of older patients. Tanaka et al suggest that CSDH may induce neurological dysfunction primarily through mechanical distortion of the central brain regions, such as the thalamus, with the influence on the remote regions attributable to transneural depression.[11] Unlike the aged, who have a decreasing brain volume, young adults have less intracranial capacity to allow hematoma expansion and deep cerebral distortion, without increased intracranial pressure. Therefore, the observation that young patients had more neurological deficits and a shorter interval from trauma to operation is a logical result of the physiological differences that occur in the brain.[12]

Comparison of CT finding between the different age groups (table 3)

Young patients group has less thickness of CSDH, isodense in nature and less evidence of brain atrophy, less evidence of bilateral disease presentation.[13] This indicate that high density area from low density area strongly suggest that recent major hemorrhage has occurred into a well developed hematoma.

Imaging characteristics indicate that repeated intra hematoma hemorrhage is unusual in young patient with CSDH and young age group patients have less evidence of brain atrophy.[14] Elderly patient has more thickness of hematoma, more evidence of b/l disease and mixed in density with

multilayering . Repeated bleeding into the hematoma cavity may induce new inflammatory process with accompanying neomembrane formation of septa which is responsible for compartmentization of hematoma cavity.[15] As with the layering of the hematoma, young adult have lower frequency of rebleeding and shorter interval to diagnosis, the multiplicity of hematoma cavities is not common.[16]

Comparison of the disease and etiological factors with different age groups. (table4)

In our study CSDH has male predominance in the each age group which is comparable with other studies also .Recent history of minor trauma to head as the main etiological factor in each age group which is statically significant also and this comparable to the other studies.[6] Brain atrophy is another etiological factor we found in this study which is statically significant also. Brain atrophy in young age group is less common as compared to older age group patient; this is also comparable with other studies.[12, 13] Bilateral disease also common in elderly and older age disease due to more evidence of brain atrophy which is also statistically significant.[15]

In our study, we studied association of antiplatelet and anticoagulant therapy with different age group, in which we found that the percentage of patient taking antiplatelet or anticoagulant is higher in older age group than younger age group. This is because as the age increases there is increase in co morbidity. We are getting increase in incidence of CSDH in a patient on antiplatelet or anticoagulant therapy but in our study association of not statistically significant. Antiplatelet and anticoagulant therapy have traditionally been cited among the risk factor for the development of CSDH, however this statement is mainly based on individual case series reports[17,18]. Our study was retrospective descriptive study for finding of clinically significant association of it we require to have large no of group of patient along with case controlled study and meta analysis. In recent systemic reviewed and meta analysis of adverse event of low dose of aspirin and clopidogrel in randomised controlled trial provide evidence that low dose of aspirin was associated with increased risk of intracranial hemorrhage.[18]

However a history of previous trauma seems to play a role as potential effect modifier of association between anticoagulant therapy and subdural hematoma and association seems to be stronger within patient with history of recent trauma[19]. In this study we did not take into account the length of chronic medical treatment and we did not compare drug dosage or the INR value at time of presentation .In our study we found 3 young adult, who was taking antiplatelet for history of chest pain, The antiplatelet was started empirically by physician. There is an increase in use of anticoagulant or anti platelet therapy among the young adult and elderly patient, due to lack of epidemiological studies to analysis the relationship between antiplatelet therapy and development of CSDH, but use of antiplatelet and anticoagulant should be judicious and we need to keep the risk of CSDH in our mind.

Conclusion

CSDH is the disease of male predominance in all age group .In young age group patient headache is the most common presenting symptom, the older age group having headache associated with cerebral hemispheric sign. Young age group patient having less thickness of hematoma (<2cm) and having isodensity on CT scan, old age group having more thickness (3.5cm) and mixed density with multiple layering .Recurrence and bilateral disease more common in old age group .Trauma to head is most common etiological factor in each age group .Brain atrophy is etiological factor associated with old age group. Antiplatelet or anticoagulant therapy is associated as risk factor for the CSDH in all age groups. The use of antiplatelet or anticoagulant should be restricted to truly indicated patients and its associated increase in risk for CSDH in our back of mind.

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