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Original Article

Evaluation of CT findings among Headache Patients at Neurology OPD in a Tertiary Care Hospital: A retrospective study

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Abstract:

Background: Headache is the most common complain of the patients presenting to Radiology Department for the purpose of doing a CT scan for headache evaluation.

Objective: (1) To find out the organic cause in patients with chronic headache with or without neurologic abnormality with the use of computed tomography (CT), (2) to know the age prevalence, (3) to know the sex variation.

Methods: All patients with complaints of chronic headache in the Department of Neurology OPD from August 2018 to July 2019 were included in the study. Total of 220 cases were included. Patients were divided into three groups based on CT scan findings: (1)Those with normal CT scan, (2) Those with minor abnormality (Not altering the patient management), (3) Those with clinically significant abnormality (Altering the management protocol). Results were tabulated and analyzed for the diagnostic yield from imaging in evaluation of patient with history of headache.

Results: Out of 220 patients, 128 had normal CT (58.18%) and 92(41.82%) had abnormal CT findings. Among the abnormal CT findings major and minor abnormalities constitute 17.27% and 24.55% respectively that will help in further management. Headache is common in both male (52.73%) and female (47.27%).No significant difference between them. Most common age group affected is 41 -60 years (35%)

Conclusion: The prevalence of intracranial abnormalities detected by CT scan in this study was almost similar to previous studies provided normal neurological examinations. In the absence of neurological abnormality, CT scan did not offer minimum advantages.

Keyword: Computed tomography scan, Headache

Introduction

Headache is the commonest symptom in practice. It is the most common illness among general people.90% of the people have at least one episode of headache per year and severe headache is found in 40% of the population yearly.[1] Population based study suggest that about 4% of adult have daily or near daily headache.[2] There are two most common cause that make the patient consult with doctor for headache.One being the patient is afraid of having a brain tumor and the other because the pain is so severe that influencing his or her quality of life. Majority of headache patient does not require any imaging, especially there is no neurological deficit.[3,4] Neuroimaging is essential tool for new onset headache,gradual worsening headache, changing pattern of headache, history of epilepsy with headache, history of head injury, personality change with headache[5,6] and presence of red flag sign (new onset headache after 50 years of age, changing headache pattern, associated with systemic illness, personality change,raised intracranial pressure, early morning headache, worsening with coughing, sneezing or straining).[3] In recent years, there is increasing trend for neuroimaging, especially in pediatric age group, though there is no neurological deficit to exclude intracranial mass lesion and patient desire also an important consideration for doing neuroimaging for headache evaluation.

Materials And Methods

This is a retrospective study conducted in the Neurology OPD, Dhaka National Medical Institute

Hospital from August 2018 to July 2019 for a period of 12 months. The clinical data and the computed tomography (CT) images of the patients undergoing cranial CT scan for the evaluation of headache were retrospectively reviewed from the record book of OPD,Neurology Department, Dhaka National Medical Institute Hospital.Then the total data were tabulated on age, sex and CT findings.

Results

Table-I: Age-wise distribution with and without abnormality on imaging

Abnormal CT Finding	≤ 20 years	21-40 years	41-60 years	61-80 years	81-100 years	Total	P-Value
Present	1(0.45%)	6(2.73%)	46(20.91%)	33(15%)	6(2.73%)	92(41.82%)	0.0001
Absent	27(12.27%)	62(28.18%)	31(14.09%)	7(3.18%)	1(0.45%)	128(58.18%)	
Total	28	68	77	40	7	220	

Table-II: Summary of age wise distribution with and without abnormality on imaging

Group	Observation	Mean	Std. Dev	P-Value
CT finding absent	128	35.055	15.188	0.0001
CT finding Present	92	60.185	13.853	
Total patient	220	45.564	19.180	Min 3- Max 95

Table-I, II represent that abnormal CT findings were more common in above 41 years of age. Mean age of all patients was 45.564 ±19.180 (Min 3-Max 95).There was a statistically significant difference (p=0.0001) of age of abnormal CT finding present (60.185±13.853) and absent (35.055±15.188) groups.

Table-III: Gender distribution with and without abnormality on imaging

Abnormality on CT	Male	Female	Total	P-Value
Present	51(23.18%)	41(18.64%)	92(41.82%)	0.495
Absent	65(29.55%)	63(28.64%)	128(58.18%)	
Total	116	104	220	

During gender distribution, abnormal CT scan findings were found among 51(23.18%) male and 41(18.64%) female. There was no significant difference between male and female (p=0.495)

Table-IV: Prevalence of the positive CT scan brain of the patient presenting with headache (N=220)

CT scan finding	Total (%) (N=220)
Normal	128 (58.18)
Abnormal	92 (41.82)
Total	220 (100.0)

Table-IV represents total 220 cases of headache patient underwent CT scan Brain and CT scan finding was abnormal in 92(41.82%) cases and normal in 128(58.18%) cases.

Table-V:Spectrum of CT scan brain detected abnormality

Parameter	Value	Value
Major abnormality		38
Acute Cerebral Infarction	31	
Intracerebral Hematoma	4	
ICSOL	1	
Meningioma	1	
Metastasis	1	
Minor abnormality		54
Degenerative Cortical Atrophy	42	
Arachnoid cyst	2	
Old infarct	10	

Table V represents the spectrum of CT scan detected abnormality where, out of 92 patient 38 (17.27%) patients had major abnormality and 54(24.55%) patients had minor abnormality.

Discussion

In our study, total 220 patients with headache underwent CT scan of brain. Normal CT finding was 58.18% and CT detected abnormality was 41.82%.Highest probability for detection of abnormalities was found in above 41years of age.There is no association between sex and abnormal CT finding.Our study represents that the mean age of the patients were 45.564 ±19.180.Rate of detection of abnormal CT findings in term of frequency was detected more in the age group above 41 years with abnormality found in 41-60 years age group 20.91% and in 61-80 years age group 15%. One study conducted by Kahn CE et al,[7] over a period of three years similar study found abnormal CT finding in 10% and rate of detection of abnormal CT finding were higher in older age group compared to younger. These findings were similar to earlier studies conducted by Carrera GF et al[8] and Ayugun D et al[9] respectively which showed

increasing age to be strongly associated with abnormal CT findings in patient with history of chronic headache.

Our study showed abnormal CT finding were present in total 41 female cases and 51 male cases. No significant difference according to gender distribution could be concluded from our study. There are no available source in literature in order to determine the relationship of gender based distribution and abnormal CT findings in patient with history of headache.

In this study, we found that a total 41.82% patients have some abnormalities in CT scan (Table I and 2).Of these 24.55% of patient had minor abnormality, not requiring change in management and 17.27% of patient had major abnormality requiring change in the management protocol. In a study, only 10% of cases CT finding were abnormal. According to meta-analysis, major abnormalities detected in patient with headache ranged from0.0% to 6.7% in ten studies.[10] In a study conducted by Subedee also showed that minor and major abnormality was 7.14% and 3.57%, respectively.[11] Observation in this study are near close to other studies.

Conclusion

Screening of headache patients with CT scan of brain not only helps in identifying an abnormality but also rule out structural cause for headache. Although CT scan is very useful for the evaluation, it should never be allowed to replace the proper clinical history taking and detailed clinical examination.

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