

Efficacy of CT Scan for Assessment of Headache

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ABSTRACT

Objective: To determine the efficacy of CT scan for assessment of Headache.

Study Design: Prospective / cross sectional study

Place and Duration of Study: This study was conducted at the Radiology Department of RMDC Lahore from January 2018 to June 2018.

Materials and Methods: This study included 136 patients with headache. All the patients had CT scan to find out the frequency of pathologies. Data was collected on a specially designed Performa and analyzed by using SPSS.

Results: The mean age of the patients was 44.80 + 23.25 years [range 20 – 70]. There were 58 (42.6%) female patients and 78 (57.4%) male patient in the study. CT scan could identify the lesion among 11 (8%) patients, while in rest of 125 (92%) patients; CT scan did not identify any pathology. Sinusitis was the most common pathology detected among 4 (36.4%) patients followed by stroke seen among 3 (27.2%) patients.

Conclusion: The diagnostic yield of CT scan in detecting lesion among patients with headache is low and radiation exposure is more.

Key Words: Computed tomographic neuroimaging, isolated headache, Assessment

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INTRODUCTION

Headaches is most common complaint in the primary health care se, as well as in the department of emergency, with a lifetime prevalence of headache is high as 90%.¹ This disabling symptom is estimated to be actively affecting 46% of the global adult population as a part of headache disorder, with 3-5% of the population experienced with chronic daily headache.^{2,3,4}

By comparison, the frequency of pathology presenting with headache is low. Yearly incidence of brain tumors in the US is 46 per 100,000, for subarachnoid hemorrhage (SAH), 9 per 100,000, for Arteriovenous malformations (AVMs) is about one-tenth as frequent as saccular aneurysms. Only a subset of these patients presents with isolated headache. In a retrospective review of the presentation of 111 brain tumors, headache was a symptom in 48%, equally for primary and metastatic brain tumors.^{5,6,7}

There is an emphasis on early detection of cause of headache because it may be the only initial presentation of serious illness (brain tumors)^{8,9,10,11} or may be caused by some treatable causes, which may lead to significant morbidity or mortality if treatment is delayed (chronic subdural hematoma in elderly).¹²

There is a trend of using computed tomography (CT) scan of brain as an initial diagnostic modality for evaluation of headache.^{13,14} which may be attributed to increasing numbers of brain imaging centers, increasing patient demand or fear of missing serious illness (subdural hematoma or suspected brain tumors) by physicians.^{15,16} CT scan has been found very useful in detecting the cause of headache in many disorders (82% patients yielded positive findings in HIV patients and 47 % among patients with ‘thunderclap headache’ when evaluated for headache).^{17,18}

Use of CT scan in evaluation of patients with isolated headache has shown a variable yield (0.4%, 1% and 2.4% in different studies) although lower than when used for other pathologies, despite a high referral rate (38%) for isolated headache.^{19,20} In most of the developing countries including Pakistan, information about usefulness of CT scan in evaluation of patients with isolated headache are lacking. Therefore, I want to conduct this study to determine that how much is the numbers of pathologies will a CT scan brain find out among the patients referred to radiology department of a teaching hospital of Pakistan. This will help us in understanding the usefulness of the technique.

MATERIALS AND METHODS

Prospective cross sectional study carried in Radiology department of RMDC Lahore from January 2018 to June 2018 including 136 patients with headache. All the patients had CT scan to find out the frequency of pathologies. Data was collected on a specially designed Performa and analyzed by using SPSS 20.

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Adding criteria:

- Gender: both male and female
- Age: 20-45 years
- Isolated headache of more than 3 months duration nor responding to treatment

Exclusion criteria:

- Previous neurosurgical procedure
- History of seizures
- Recent head trauma (less than 3 months before evaluation)
- Prior neurological abnormalities
- History of cancer
- Patients who do not gave consent for participation

RESULTS

Regarding Age: Mean age was 44.80 + 23.25 [array 20 – 70]. There were 37 (27.2%) of 20 – 30 years, 32 (23.5%) were 31 – 40 years, 27 (19.9%) patients of age range of 41 – 50 years, 20 (14.7%) of age range of 51 – 60 years and 20 (14.7%) patients in the age range of 61 – 70 years. (Table 1)

Distribution of patients by sex: 58 (42.6%) female and 78 (57.4%) male patient in the study.

Distribution of patients by identification of pathology by CT scan heads: There were 11 (8%) patients in whom CT scan could identify the pathology, while in rest of 125 (92%) patients; T scan did not identify any pathology.

Distribution of patients by CT scan findings: There were 11 patients in whom pathology was identified by CT scan. Sinusitis was observed among 4 (36%) patients, space occupying lesions among 2 (18.2%) patients, hemorrhage among 1 (9.1%) patients, chronic subdural hematoma among 1 (9.1%) patients, stroke among 3 (27.2%) patients and none of the patients had tumor or vascular malformation. (Table 2)

Cross tabulation of patients by age with CT scan findings for detection of pathology: Hemorrhage was seen in 1 (9.1%) in age group 41 – 50 years. All of 3 (27.2%) patients with stroke were from age group 61 – 70 years. Chronic subdural hematoma was seen in 01

(9.1%) patient who belong to age group 61 – 70 years. (Table 3).

Table No.1: Age (n=136)

Age	No. of patients	Percentage
20 – 30	37	27.2
31 – 40	32	23.5
41 – 50	27	19.9
51 – 60	20	14.7
61 – 70	20	14.7
Mean + SD	44.80 + 23.25	
Range	20 – 70	

Table No.2: Distribution of patients by CT scan findings (n=11)

CT scan findings for pathologies	No. of patients	Percentage
Sinusitis	4	36.4
Space occupying lesion	2	18.2
Hemorrhage	1	9.1
Chronic subdural hematoma	1	9.1
Stroke	3	27.2
Tumor	0	0
Vascular malformation: AVM/ Aneurysm	0	0

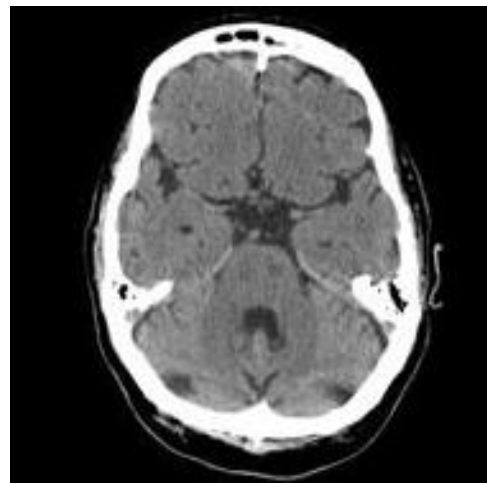


Figure No.1: Diagram of head

Table No.3: Cross tabulation of patients by age with CT scan findings for detection of pathology (n=11)

Age (years)	On CT scan						
	Sinusitis	Space occupying lesion	Hemorrhage	Stroke	Chronic subdural hematoma	Tumor	AVM
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
20 – 30	2 (18.2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
31 – 40	2 (18.2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
41 – 50	0 (0)	0 (0)	1 (9.1)	0 (0)	0 (0)	0 (0)	0 (0)
51 – 60	0 (0)	1 (9.1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
61 – 70	0 (0)	1 (9.1)	0 (0)	3 (27.2)	1 (9.1)	0 (0)	0 (0)
Total	4 (36.4)	2(18.2)	1 (9.1)	3 (27.2)	1 (9.1)	0 (0)	0 (0)

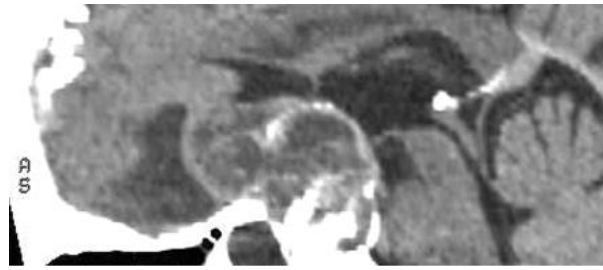


Figure No.2: Diagram of head

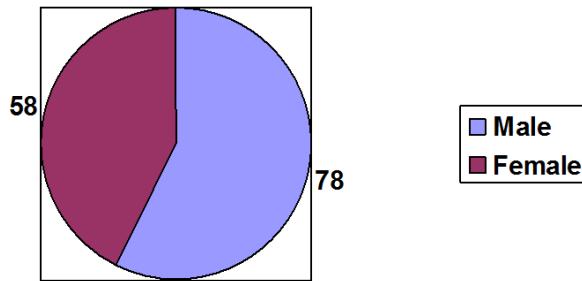


Figure No.3: Distribution of patients by sex (n=136)

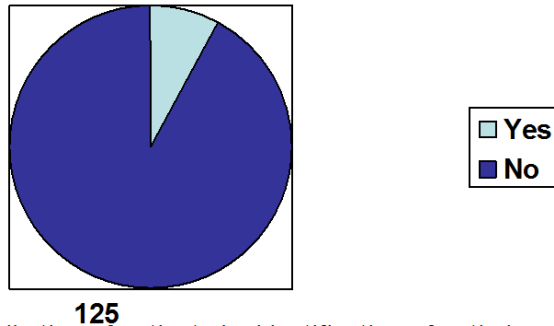


Figure No.4: Distribution of patients by identification of pathology by CT scan heads (n=136)

DISCUSSION

Headache is routinely encountered by physicians in their outdoor and emergency setting. Due to fear, or over demanding by the patients, CT scan is very frequently advised by the treating physician. Even so much advancement has been made in this technology; CT scan cannot establish the diagnosis in all cases.

In this study, we tried to determine the diagnostic yield of CT scan, and this was detected that it could establish the diagnosis among 8% patients with isolated headache. The yield of CT scan was low in our study. Sinusitis was diagnosed in 36.4% patients, followed by space occupying lesion among 18.2% patients.

The diagnostic yield of CT scan has already been discussed by many other authors in literature and there is no common consensus over it.

Patients mean age was 46±10 years. So, this can be observed that in local study, there was not much difference of age group. So, this age group difference may be geographical, which needs to be evaluated.

There were 57.4% male patients in our study, while 42.6% female patients. Saberi H, et al.¹⁸ documented a female dominance with a frequency of 69% female patients in their study. Ahmad A, et al.¹⁶ also noted a female dominance in their study. There were 61% patients who were female and 39% patients were male.

The diagnostic yield of CT scan in our study was 8%. Some other studies also studied the diagnostic yield of CT scan. Saberi H, et al.^{19,20} conducted a study on 146 patients in whom CT scan was conducted for headache. They found that CT scan yielded diagnosis in only 6% patients.

CONCLUSION

The diagnostic yield of CT scan in detecting lesion among patients with headache is low and radiation exposure is more.

Author's Contribution:

Concept & Design of Study:	Muhammad Asghar Bhatti
Drafting:	Abdul Qayyum
Data Analysis:	Awais Hussain Shah
Revisiting Critically:	Muhammad Asghar Bhatti, Abdul Qayyum
Final Approval of version:	Muhammad Asghar Bhatti

Conflict of Interest: The study has no conflict of interest to declare by any author.

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