COMPUTED TOMOGRAPHIC SCANNING IN PATIENTS PRESENTING WITH CHIEF COMPLAINT OF HEADACHE WITHOUT FOCAL NEUROLOGICAL SIGNS

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ABSTRACT

Objective: To determine the frequency of positive computed tomographic (CT)scan findings in patients presenting at PNS Shifa Hospital Karachi with chief complaint of headache without focal neurological signs.
Study Design: Cross sectional descriptive study.
Place and Duration of Study: The study was conducted at the Radiology department, PNS Shifa Hospital Karachi from Dec2011 to Jun2012.
Patients and Methods: This cross-sectional descriptive study included referred patients with complaint of headache of one month duration or more without focal neurological signs. No gender restriction was considered and patients of age more than 14 years were included. Patients with headache due to other known clinical disorders such as intracranial neoplasm and stroke were excluded. Patients with focal neurological signs such as hemiparesis, cerebellar signs and cranial nerve palsies were also excluded from the study. A total of 105 patients were included in the study through non probability consecutive sampling. Informed written consent was taken from the patients by explaining all the risks and benefits of the study and use of data for research and publication. Plain CT scan brain was done by trained CT technician and reporting of CT scan was done by consultant radiologist. CT scan was done on Toshiba Scanner Aquilion-64 CT Scan machine. The imaging protocol consisted of appropriately angled continuous 5mm thick axial slices for the posterior fossa and 10 mm thick slices for the rest of brain from the base of skull to the vertex. Data was collected through a specially structured proforma. Confidentiality of the patients' record was maintained.
Results: Majority of the patients were between 31-40 years of age i.e. 29.52% (n=31) and mean and SD was calculated as 34.24 ± 8.72 years, 54.29% (n=57) females and 45.71% (n=48) male patients, frequency of positive CT scan findings in patients with chief complaint of headache without focal neurological signs was recorded as 14.29% (n=15).
Conclusion: The frequency of positive CT scan findings in patients presenting at PNS Shifa Hospital Karachi with chief complaint of headache without focal neurological signs was low. Due to potential risk of cancer from exposure to ionizing radiations, efforts should be made to avoid CT scanning for headache when the likelihood of serious illness is low.

Keywords: CT-Scan, Headache, Neurologic deficit.

INTRODUCTION

Headache is one of the most frequent ailments of the human race with prevalence estimated at 11%–48% in children and 6%–71% in adults; however the frequency of pathology presenting with headache is low[1]. Symptoms of headache can be worrying resulting in tremendous costs in productivity and quality-of-life losses. The diagnosis of headache is usually made on subjective symptoms and is generally classified into two types, primary headache and secondary headache. Family physicians are frequently asked to assess a patient with headache, which can be a difficult anddemanding task.Serious intracranial disorders such as tumor or intracranial hemorrhage are found only in a minority of patients having headache. These should be correctly diagnosed without subjecting many patients who have benign headaches to expensive and potentially harmful over investigation. CT scan is the most preferred diagnostic modality of doctors in evaluating

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headache patients. The diagnostic yield of neuroimaging in chronic headache is low, however it can reduce the use of health services by reducing referral to secondary care[2].Studies have emphasized that identifying those patients with headache who do not require neuroimaging may reduce the use of CT scans in situations of little benefit[3]. Thunderclap headaches, headaches radiating to the neck, and temporal headaches in an older individual are the examples of headaches where imaging may be helpful. Routine computed tomography of the brain in headache patients with no extraordinary clinical symptoms and with normal physical and neurologic exams have a low probability ratio for discovering significant intracranial disease, only 11% showed abnormalities[4].The diagnosis of correctable abnormalities from routine CT scan of the brain in headache patients with normal neurologic examination is very low and does not validate its use in a resource poor country[5]. Clear guidelines for the use of CT for the investigation of headache are not outlined; however concerns exist about overuse of computed tomography scans for headache in health care facilities. This study would help physicians in appropriate selection of patients with headache, based on relevant history and clinical examination, to undergo CT scan brain and will measure the usefulness of cerebral imaging in patients with headache.

PATIENTS AND METHODS

This cross-sectional descriptive study was conducted at the Radiology department, PNS Shifa Hospital Karachi, where computerized tomography machine is available from 1st December 2011 to 1st June 2012. Patients referred by physicians with chief complaint of headache for the past one month or more without focal neurological signs were included in the study. No gender restriction was considered and patients of age more than 14 years were included. Patients with headache complicating other clinical disorders such as known intracranial neoplasm and stroke were excluded. Patients with focal neurological signs such as hemiparesis, cerebellar signs and cranial nerve palsies were also excluded from the study. Trauma cases were also exempted.Administrative permission was taken from concerned authorities. Approval of the ethical committee was sought. A total of 105 patients were included in the study through non probability consecutive sampling. Informed written consent was taken from the patients by explaining all the risks and benefits of the study and use of data for research and publication. Plain CT scan brain was done by trained CT technician and reporting of CT scan was done by

Table-I: Frequency of positive CT scan findings in patients with chief complaint of headache without focal neurological signs (n=105).

Positive CT scan findings	No. of patients	%
Yes	15	14.29
No	90	85.71

Table-II: Details of positive CT scan findings in patients with chief complaint of headache without focal neurological signs (n=105).

Positive CT scan findings	No. of patients	%
Sinusitis	6	5.71
Brain atophy	3	2.86
Glioma	2	1.90
Meningioma	2	1.90
Arachnoid cyst	1	0.95
Unruptured cerebral aneurysm	1	0.95

consultant Radiologist.CT scan was done on Toshiba Scanner Aquilion-64 CT Scan machine. The imaging protocol consisted of appropriately angled continuous 5 mm thick axial slices for the posterior fossa and 10 mm thick slices for the rest of brain from the base of skull to the vertex. Data was collected through a specially structured proforma. Confidentiality of the patients' record was maintained. Data had been analyzed using SPSS version 15. Descriptive statistics were used to describe the results i.e. mean and standard deviation for quantitative variables while frequency and percentages for qualitative variables.

RESULTS

A total of 105 patients were enrolled.Age distribution of the patients revealed that majority of the patients were recorded between 31-40 years of age i.e. 29.52%, 25.71% were between 42-50 years, 21.91% between 21-30 years, 12.38% between 14-20 years and 10.48% were recorded with >50 years of age. Average age was 34.24 ± 8.72 years. Gender distribution of the patients showed 54.29% females and 45.71% male patients. Frequency of positive CT scan findings in patients with chief complaint of headache without focal neurological sings was recorded as14.29% (n=15) while 85.71% (n=90) had no positive CT scan findings (table-I). Abnormalities encountered in patients with positive CT scans included sinusitis in 5.71% (n=6), brain atrophy in 2.86% (n=3), meningioma in 1.90% (n=2), glioma in 1.90% (n=2) and arachnoid cyst in 0.95% (n=1) (table-II).

DISCUSSION

The life time prevalence of Headache is more than 90% in general population in United Kingdom, making it a very common complaint[6]. Headache is chief complaint in 4.4% of consultations in primary care[7] and 30% of neurology outpatient consultations[8-9]. Patient of headache is much more content and overall anxiety is relieved about having an underlying pathologic condition after a normal neuroimaging. A British study revealed that 60% of 109 patients indicated having considerable fears of serious illness after visiting a headache clinic[10].Of these patients, 40% left the clinic still fearful, with some requesting imaging studies. Neuroimaging studies in patients with headache are often performed because of litigation concerns and the patient's or the family's request. "False positive studies" causing undue worry to the patient, false reassurance from an inadequate study and the risks of an allergic reaction to iodine contrast media are the possible risks to be considered in neuroimaging. There are amazingly few guidelines to evaluate patients with headache which can assist physicians in the use of neuroimaging. Existing recommendations do not provide guidance about the use of neuroimaging for other common headache presentations[11,12]. Computed tomography scans of the head performed in outpatients for evaluation of headache showed clinically relevant findings only in 2% to 11% of scans suggestive of low diagnostic yield[4,13-17]. These studies have highlighted the concerns that neuroimaging is being overused in the evaluation of patients with headache, causing additional strain onrestricted healthcare resources and needless exposure to radiation[18,19]. We recorded majority of the patients between 31-40 years of age and frequency of positive CT scan findings in patients with chief complaint of headache without focal neurological sings was recorded in 14.29% (n=15). There are growing concerns relating to radiation exposure during CT scan causing consider able health risk. A single CT scan of the head has an average radiation dose of 1 to 2 millisieverts (equivalent to 100-200 chest x-rays). The anticipated lifetime risk of cancer attributable to a single CT scan of the head is 0.005% (1/20,000) for a 45-year-old individual[20]. The risk is higher among younger patients and among those who are receiving higher cumulative doses of radiation owing to multiple radio diagnostic tests. Young patients undergoing CT scan for headache are at larger risk of cancer from CT-associated radiation. Moreover, they have extra years of life remaining during which to

accumulate greater cumulative doses of radiation. Thus, every effort should be made by clinicians to curtail the use of CT scans to evade unnecessary radiation exposure when the probability of a secondary cause of headache is low.

CONCLUSION

The frequency of positive CT Scan findings in patients presenting at PNS Shifa Hospital Karachi with chief complaint of headache without focal neurological signs was low. Considering the impendingrisk from exposure to ionizing radiations such as cancer, dedicated efforts should be made to avoid CT scanning for headache when the possibility of serious illness is low.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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