ORIGINAL ARTICLE

Assessment of the Effectiveness of Computed Tomography Brain Plain in Headache Patients

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ABSTRACT

Aim: To assess the effectiveness of computed tomography (CT) brain plain in patients with history of headache**.**
Methods: This cross-sectional study was conducted at Radiology Department, Bolan Medical College Hospital and Akram Hospital Quetta from 1st June 2017 to 31st December 2017. Sixty patients with history of headache were included. Patients with history of head trauma, cranial surgery and malignant lesions were excluded. Findings on CT scan brain plain were studied and result was compiled by dividing it into 2 categories (i) no intracranial abnormality and (ii) with significant intracranial abnormality.
Results: Results show 34 females and 26 males with age between 8-60 years mean 31.35±11.30 years were in the study. According to CT findings, 88.3% found negative cases while 11.7% found positive cases. Keeping referral and bulk of patients for CT scan brain plain with only history of headache, patients were less than expected with significant brain pathology.
Conclusion: CT brain Plain in patients of headache and no other clinical signs has a low significance Radiologist and physician must work as team for referral and selection of imaging. Different workshops about proper selection and referral of neurological imaging must be conducted in different departments and at different level.
Keywords: Assessment, Computed tomography; Headache, Effectiveness

INTRODUCTION

Computed tomography (CT) was first used at the Atkinson Morley Hospital in London in 1972. CT scans quickly turned out to be the pillar for diagnosis of brain diseases till magnetic resonance imaging was introduced in late 1980. Even though CT in emergency cases is still very important method of investigation[1].

Definition of headache is pain not limited to nerve distribution area. It is most common complaint made by patients in outdoor department with other complaints and common reason for frequent visits of hospital with frequent referral to specialist[2].

People having complaint of general headache are 46%, migraine in 11%, tension headache in 42% and only 3% are with chronic headaches. World Health Organization has ranked headache into the 10 most debilitating disorders for the adult population in both genders (male and female) and fifth most debilitating conditions for women[3-5]**.**

A systematic and devoted clinical history with comprehensive neurological and physical examination helps in determining for advice of brain imaging and neurological investigation to evaluate any brain pathology in patients with symptom of only headache and no clinical warning sign. CT scan brain plain is advised by clinician to reduce the concern of patient and family as it is easily available with less time and cost effective.[6] But there will always be question about justified radiation dose and radiation protection in children and female of reproductive age. As 40% of total medical diagnostic radiation is due to CT scan which comprises of only 4% in radiology examinations. For this reason use of CT imaging of brain must be justified against the radiation dose. CT is quite helpful to resolve and sort out problems, but it cannot substitute proper history taking and clinical examinations for diagnosis. Patients can be coped with no radiological investigation presenting with only history of headache and no other warning symptoms but in era of internet and information technology patients are not satisfied. Yet patients are more curious for in-depth investigation and "high-tech" evaluation due to increasing no. of imaging centers and invent of new radiological modalities. While clinicians are also inclined to the increasing practice of defensive medicine[7].

Patients with only symptom of headache is causing quiet load in outdoor department and increase burden on public health budget. Headache is one of the major communal health problems and its magnitude is not properly evaluated. Headaches cause frailty, misery and loss of healthy life which is similar to other chronic conditions. Headache is also a matter for numerous visits to the emergency department and referral to radiology department for CT scan brain plain but most of cases are negative and only produce burden on radiologist and radiology department with loss of quality time as this time can be given to eligible cases[8,9].

Parameters must be developed for referral of patients to radiology department to reduce burden over department, radiologist and health budget. The Groundwork for such parameter need to be multidisciplinary effort between clinicians and radiologists, and should be based on available literature and existing evidence based clinical practice guidelines used by other institutions[3].

MATERIALS AND METHDS

This cross-sectional study was conducted at Radiology Department of Akram Hospital Quetta from 1st June 2017 to 31st December 2017. Sixty patients with history of headache were included while exclusion criteria were head trauma, cranial surgery and malignant lesion. Radiological

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findings of all CT brain plain were studied by radiologist. The regular protocol of plain CT scan head was followed. With this protocol patient is in supine position and from base of skull up to vertex, 5 mm slices were taken using a Toshiba Asteion scanner following regular head CT protocol (120 kV, 200mAs for adults and 120 kV, 100 mAs for pediatric patients). Computed tomography images were studied by skilled radiologist and the results were divided in to two categories; (1) no intracranial abnormality (negative study) and (2) significant intracranial abnormality. So only reason for CT scan brain plain in absence of clinical warning signs look like to be comforting the patients and their family, relieving their anxiety. Assuring them that there is nothing to worry and medicine is the cure. So in these circumstances local clinical parameters must be developed and used as guide line for advice of neurological imaging. The data was entered and analyzed in SPSS-20.

RESULTS

The patients were between 8 to 50 years of age with mean±SD was 31.35±11.30 years. There were 26 males (43.3%) and 34 females (56.7%) patients. On computed tomography, 88.3% demonstrated negative while 11.7% were positive. The clinically significant positive cases were less than expected (Table 1).

Table 1: Demographic information of the patients (n=60)

Variable	**No.**	**%**
Age (years)		
8 – 20	10	16.7
21 – 40	39	65.0
41-60	11	18.3
Gender		
Male	26	43.3
Female	34	56.7
CT Finding		
Normal	53	88.3
Abnormal	7	11.7

DISCUSSION

The results of the most patients presented with headache were normal, no lesions were observed so it is important that patients must have detailed history and neurological examination and patients with only positive clinical signs should be advised for CT scan brain plain. This allows the radiologist to select and arrange the requests on priority basis. It will maintain order, reduce waiting time and relieve agony of patient. It will also help in decreasing the burden on the diagnostic radiology department, radiologist and conserve health budget. Generally it is recommended that evaluation of patients by CT brain plain with only history of Headache is usually not justified and it should be considered in patients with positive clinical findings. Local standard parameters should be established for patients of headache in association with referring clinicians. These parameters must be part of curriculum and ward protocol so newly qualified doctors will also be aware of problem. This system will help the radiologist to take the request on priority basis and maintain balance, thus decreasing the waiting time and burden on the Diagnostic Radiology Department. Earlier studies have shown that CT scan brain of patients with only history of headache show low proportion of positive significant results[10,11,12]. It is assessed that CT scan add to 10% of all diagnostic radiological studies and add 70% to the combined radiation dose to which patient is exposed. There are growing concerns about risk of radiation associated cancers Increasing use of CT scan is accompanied by[7].

Many reports are published by the national academy of science indicating and warning about ionizing radiation and its biological effects. In these reports it is assessed that single dose of 10 mSv related to risk of 1:1000 for leukemia or other solid cancer. So radiation hazards and its effects must be kept in mind before advice of neurological imaging and study must be justified against benefit and risk ratio. In few reports patients are exposed to less radiation dose where appropriate study after proper history and examination was advised for CT sinuses[13,14].

Patients with migraine and normal neurologic examination commonly require no neuroimaging but in patients with atypical migraine or in patients who do not justify the definition of migraine needs CT scan. Clinician comes across frequently to patients with complaint of headaches. It can be evaluated by a proper history complemented by comprehensive examination of patient. Generally CT brain plain recommendations include clinical warnings as well as to relieve the concern of patients and their relatives including medico-legal apprehensions on clinician. In the era of managed care, concerns over deselecting and negative capitation may deter the clinician to advise a medically indicated scan[15-17].

CONCLUSION

Computed tomography brain plain in patients with headache showed low proportion of positive results, so clinical assessment is necessary for decision about advice and selection of imaging. This will help to top list high risk patients and relieve their agony and suffering related to time. It will prevent increase radiation dose to patients and lessen the waiting time in radiology department for imaging. Guideline is to be constructed for diagnostic testing in headache patients. Local clinical parameters are required for decision making about advice of imaging. Work should be done to educate and develop a culture of proper use of imaging. It is associated with clinician knowledge and use of locally developed parameters for referral and selection of appropriate imaging. It will help at every level from decision making for medical imaging to referral in radiology department and follow-up. It will minimize impractical burden over radiology department, radiologist and waiting time of patient. Key for this manual is mutual work and communication between radiologists and referring clinicians.

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