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ABSTRACT

Methodology: It was a cross sectional Analytical study conducted at Department of Radiology AL RAZI HOSPITAL MM ALAM LAHORE. From 1st July 2019 to 31st December 2019.The 172 subjects were selected of history and clinical examination and suspicion of head injuries requiring head CT scan evaluation. Subjects included both male and female gender age over 10 years and less than 70 years were selected. Contraindication to CT imaging and pregnant females were excluded. Patients were examined using 64 Slices dual source SIMENS CT machine. All the information of patient were noted on a specifically designed for this purpose.

Results: Mean age of patient was 36.87± 13.02 years. Most frequent age group was 15-30 years having 75(42.8%) subjects. There were 125(71.4%) male and 50(28.5%) females in the study respectively. There were 126 true positive, 12 false positive, 11 false negative and 17 true negative cases. This study revealed computed tomography sensitivity (72%) specificity (94%) diagnostic accuracy is (97.1%), Positive predictive value is (97.98%) and negative predictive value is (71.69%).

Conclusions: It was concluded that Computed tomography is a useful diagnostic tool after clinical evaluation in patients imaging for the diagnosis of subdural and epidural hematomas in patients of road traffic accident.

Key words: Computed tomography scan, Epidural hematomas, subdural hematomas, intracranial injuries

INTRODUCTION

Head injury is very common in teenagers and young adults; the prevalence has been reported as 12.9 %. Ct scan is considered as the primary modality of choice for evolution of intracranial injuries in road traffic accident. This study is aimed to determine diagnostic accuracy of CT scan in early detection of epidural and subdural hematomas in patients of RTA. Head injury refers to trauma of head .It can be defined as any change in mental and physical function which is related to blow to head. It may or may not contain injury to brain. Loss of consciousness do not need to occur. [1] Trauma is one of the most common cause of lifelong disability in early decades. Roads traffic accidents (RTA) are the leading and the leading cause of head injury in youth.2 It is observed that head injury is the immediate and second major cause of death in road traffic accident (RTA). Road accidents are the cause of 60% brain injuries in world.[3] Traumatic brain injury (TBI) is a declination to the brain due an external mechanical force which can lead to permanent or temporary insult to brain. Intracranial bleed can b categories according to their location .Epidural hemorrhage (EDH), subdural hemorrhage (SDH), Intra cerebral hemorrhage (ICH), and subarachnoid hemmorraghe.[4]

Subdural hematoma(SDH) is a type of intracranial bleed in which collection of blood gathers between the inner layer of durra mater and arachnoids mater of the meanings surrounding the brain. It can be categorized into acute SDH (aSDH) and chronic SDH (Csdh).[5]Acute traumatic subdural hematomas are most common. Post traumatic acute subdural hematomas (SDH) generally appears hyper dense on computed tomography.[6]These hematomas are neurological emergencies.[7] Epidural hematoma (EDH) is a traumatic accumulation of blood when bleeding occurs between tough outer membrane covering the brain (durra matter) and the skull.[8]Acute epidural hematoma appears on computed tomography as a high density lentiform lesion however,subdural hematoma appears as a crescent shape lesion. Intracranial lesions may be focal or diffuse.[9]The principal phenomena of TBI can be categorized as focal brain damage due to contact to solid surface resulting in contusion, laceration, and intracranial hemorrhage or (b) diffuse brain damage due to acceleration. The deceleration injury types resulting in diffuse axonal injury or brain swelling.[4]Different radiological modalities are used for evaluation and early detection of head injuries like skull x.ray, computed tomography (CT), Magnetic resonance imaging (MRI). Computed Tomography(ct) of brain remains more sensitive and easily available imaging modality in the early workup which is performed for the evaluation of traumatic brain injury.[10]An acute subdural hematoma(aSDH) can be identified within 72 hours on unenhanced ct scan.[5]Computed tomography play a vital role in the detection of the head trauma related problems in the emergency radiology department. Computed tomography(CT) detect the intracranial abnormalities accurately that were previously demonstrated by the invasive radiological methods.[11]Computed tomography is the early diagnostic modality in the patient with suspected head trauma it can rapidly and precisely recognizes intracranial haemorrhages including subdural, epidural and subarachnoid hemmorraghe.[12] CT scan can be established as sensitive and specific imaging modality for the diagnosis of epidural hematoma and subdural hematoma in patients having head injury. Computed tomography is always the first line modality for diagnosis of epidural hematoma (EDH) and subdural hematoma primarily due to rapidity of diagnosis in patient with road traffic accident.[13]A delayed detection and diagnosis of intracranial truma can lead to the progressive brain damage.[14]

MATERIAL AND METHODS

It was a cross sectional Analytical study conducted at Department of Radiology AL RAZI HOSPITAL MM ALAM LAHORE. From 1st July 2019 to 31st December 2019. 172 subject were selected of history and clinical examination and suspicion of head injuries requiring head CT scan evaluation. Subjects include both male and female gender age more than 10 years and less than 70 years were selected. Contraindication to CT imaging and pregnant females were excluded. Patients were examined using 64 Slices dual source SIEMENS CT machine. All the information of patient is noted on a specifically designed for this purpose. Patients were scanned mostly in supine position. Focused was to obtained good quality images through keeping the low radiation dose.

RESULTS

Mean age of patient was 36.87± 13.02 years. Most frequent age group was 15-30 years having 75(42.8%) subjects. There were 125(71.4%) male and 50(28.5%) females in the study respectively. There were 126 true positive, 12 false positive, 11 false negative and 17 true negative cases. This study revealed computed tomography sensitivity (72%) specificity (94%) diagnostic accuracy is (97.1%), Positive predictive value is (97.98%) and negative predictive value is (71.69%).

DISCUSSION

Trauma is the most common reason of death in population of Pakistan due to road traffic accidents in the teenagers and young adults.[1]Present study was designed to determine the accuracy of the computed tomography in the early diagnosis of the subdural and epidural hematoma in the patients of road traffic accidents. The result of the present study match with local and international study. In the present study sensitivity of the computed tomography was revealed 72% specificity 94% diagnostic accuracy 97.1%.[13]Positive predictive value is 97.98% and negative predictive value is 71.69%. The majority of head injuries are the due to the road traffic accidents. The choice of right approach on the proper time is vital in the treatment of patient with head injury. Ummara Siddiqui et al represented a study to determine the frequency of intracranial haemorrhage on CT scan in patients having the history of trauma.

Out of 165 patients with head injury 25 (15.3%) showed traumatic intracranial haemorrhage on computed tomography out of 25 patients 9 (36%) had subdural hematoma. Whereas 5 (20%) had subarachnoid and 7 (28%) had epidural hematoma. Age range was 16-30. The 13 out of 25 patients were male and showed higher incidence of intracranial haemorrhage (72%) as compared to female patients with history of road traffic accidents show higher incidence. In the study subdural hematoma were more common and mostly associated with road traffic accidents(RTA).[2] A similar cross sectional study was conducted by SHISTA NAYAR head injuries was diagnosed by ct scan 4029 patients.3254(80.8%) were male and 775(19.2%) were females these patients were referred radiology department for CT scan head. The majority of patients show findings on ct.[3] YB Roka and their associate in a study evaluated that the ct scan has become popular imaging modality in the diagnosis of traumatic brain injuries due to its availability. In the study the most common case of the head injury was road traffic accidents and the patients having the symptoms of nausea and vomiting were the most common. The number of cases in this included was 71 with males (48 cases 67.6%) more common than females (23 cases 32.4). The most common age group was 20-40 with (30 cases 29.5%).with the easy availability early diagnosis ct scan is performed.

A retrospective cohort study done by LW Cheung Computed tomography (CT) brain has become a popular modality to detect head injury related problems for patients seen at the Emergency Departments (ED). This study was aimed to assess the diagnostic accuracy of CT to detect the head injury and to assess the association between years of working experience of ED medical staff and the diagnostic accuracy of CT brain interpretation.

CONCLUSIONS

Computed tomography is a useful and valuable diagnostic tool in early deduction of epidural and subdural hematoma due to head trauma in road traffic accidents. So, we recommend that clinical follow up is adequate for patients whose computed tomography results are negative for head injury.

RECOMMENDATION

Current study has some recommendation. For this study the sample size should be unlimited. Female participants also should be included in this study.

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Table No. 1

Age Distribution of Patients Presented with Head trauma

Age (in years)	No. of Patients	Percentage (%)
15 — 30	75	42.8
31 — 45	55	31.5
46 — 60	29	16.5
61 and above	16	9.2
Total	**175**	**100.0**

Graph No. 1

Age Distribution of Patients Presented with head injury

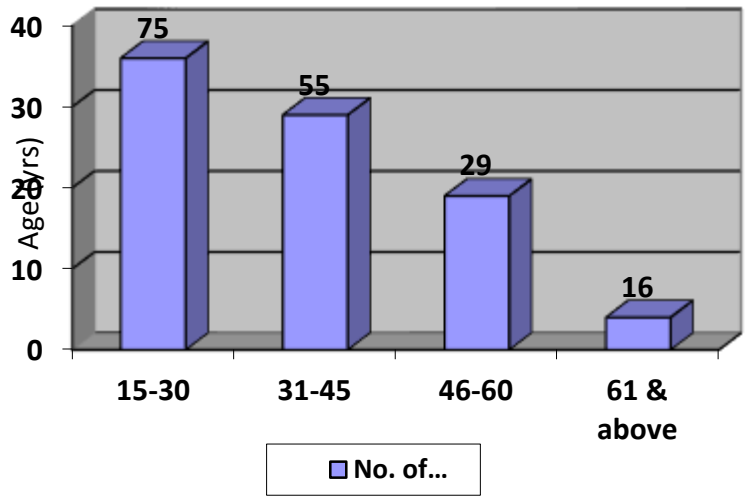


Table NO.2 **head Injury Detected on computed tomography in Patients of RTA**

Presence of head Injury	**No. of Patients**	**Percentage (%)**
Yes	125	71.5
No	50	28.5
Total	**175**	**100.0**

Table NO: 3 Types of head injury in patients of RTA

types of Head injury	**No. of Patients**	**Percentage (%)**
Epidural hematoma	80	64
Subdural hematoma	35	28
Both epidural and subdural hematoma	10	8
Total	**125**	**100.0**

Table No. 4

Gender Distribution of Patients Presented with Head Trauma

Sex	**No. of Patients with head injury**	**Percentage (%)**
Male	125	71.4
Female	50	28.6
Total	**75**	**100.0**

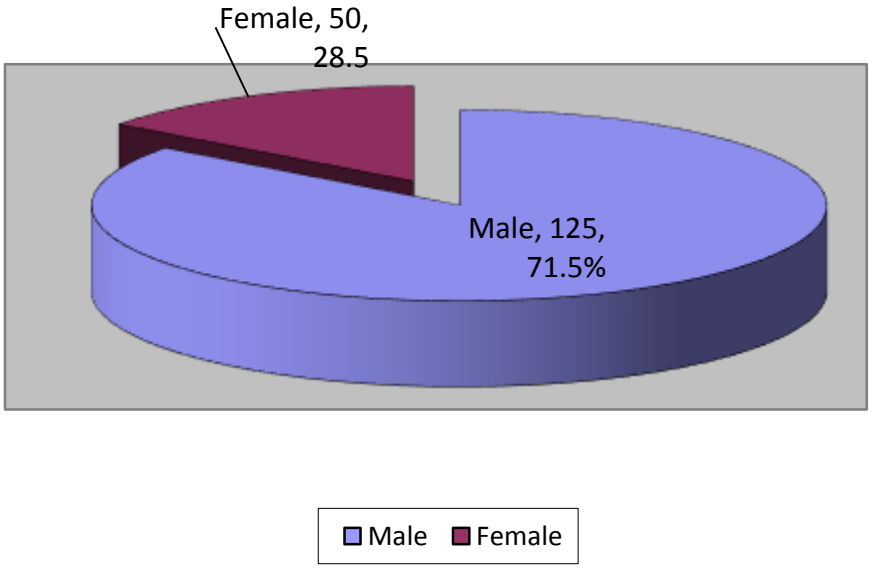


Figure No. 4

Gender Distribution of Patients Presented with head injury in relation to Outcome

IMAGES

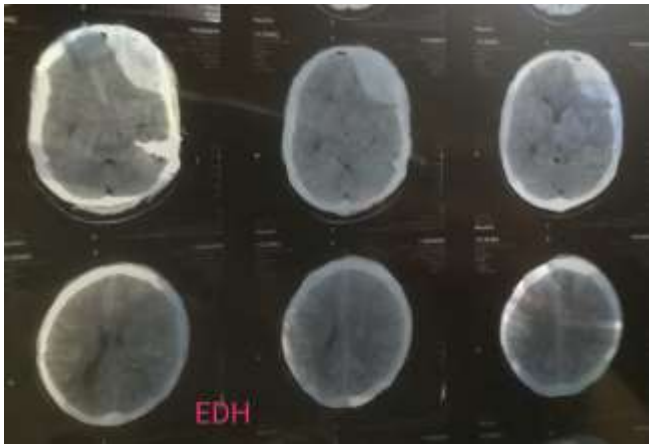
CASE :1

Chronic subdural hematoma in patient of RTA

CASE : 2

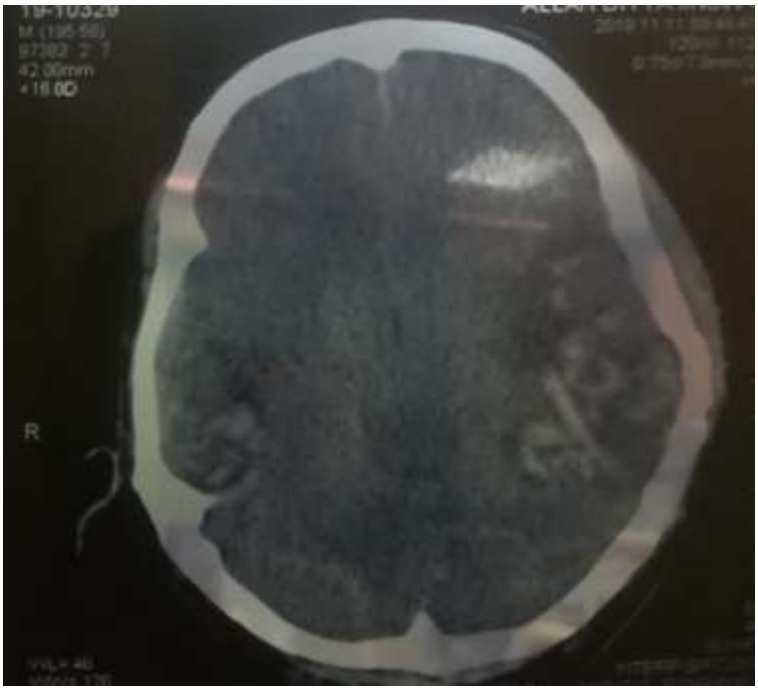
CT scan Image shows Subdural hematoma in a patient of road traffic accident.

CASE: 3



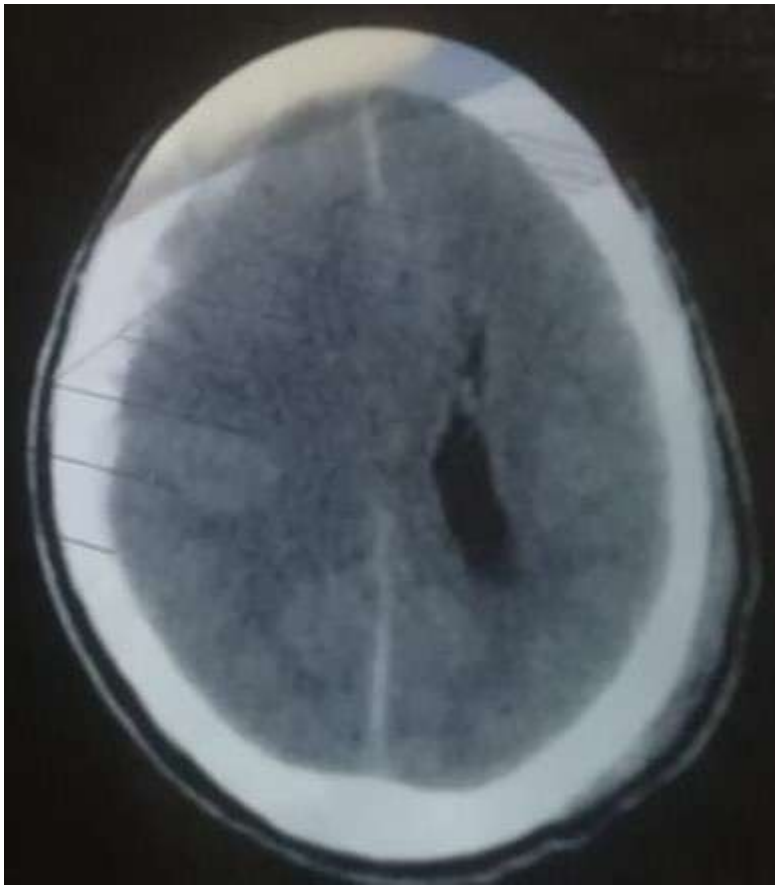
CT scan image of the brain showing the Epidural hematoma in patient of RTA.

CASE : 4



This image shows Subdural hematoma due to head injury

CASE : 4



Computed tomography image of brain showing multiple hperdense areas