International Research Journal of Public and Environmental Health Vol.6 (3),pp. 24-31, June 2019
Available online at https://www.journalissues.org/IRJPEH/
https://doi.org/10.15739/irjpeh.19.004

ISSN 2360-8803

Original Research Article

Trends of computerised tomography findings of traumatic head injury patients in a Ghanaian tertiary healthcare centre

Received 18 April, 2019 Revised 23 May, 2019 Accepted 27 May, 2019 Published 4 June, 2019

Hayford Kwakye Asare[1*], Emmanuel Akorli[2], Abubakari B Abdulai[2], Patricia Akorli[2] and Samson Aweligiba[2]

[1]X-Ray Unit, Tamale Regional Hospital, P. O. Box TL 2649, Tamale, Ghana.
[2]Radiology Department, Tamale Teaching Hospital, P. O. Box TL 16, Tamale, Ghana.

*Corresponding Author
E-mail: nkwabrodo@yahoo.com

Tel: +233200876050

Traumatic head injury (THI) is of great public health importance as it account for over 40% of morbidities presenting at various hospitals annually. This study evaluated the patterns of head CT findings of 53 head trauma patients that visited the Tamale Teaching Hospital (TTH) from 2016 to 2018. A retrospective approach was adopted for the study. Tables and graphical descriptors were used to summarise the extracted data using the Statistical Package for the Social Sciences (SPSS) version 21.0. The results revealed that 21 (39.62%) and 26 (49.06%) of patients sustained intra-cranial and extra-cranial injuries respectively. Unspecified source and RTA contributed 60.36% and 33.97% of the sources of trauma respectively. Fractures (92.31%) and sinusitis (76.91%) were the major leading extra-axial lesion whereas brain contusions (33.32%) and intra-cranial haematomas (52.36%) were the most predominant intra-axial lesions. The sex outcome was 41 (77.36%) males and 12 (22.64%) females. Occurrence of trauma and THI were frequent in the age groups 21-40 years and ≤10 years than any other age categories. In conclusion, greater percent of the assessed patients with THI were males, young persons and ≤10years of age. Both intra and extra-cranial injuries were observed in our study sample except that normal findings were more common.

Key words: Trauma, head injury, computed tomography, findings, pattern.

INTRODUCTION

Traumatic head injury (THI) is notably the leading cause of death and disability in more than 50% of cases of all trauma related incidence, particularly in low-and middle-income countries (LMICs). THI refers to any trauma resulting in damage to the scalp and or skull, and or brain (Adogu et al., 2015; Onwuchekwa and Alazigha, 2017). Another literature defines THI as, "a morbid state, resulting from gross or subtle structural changes in the scalp, skull, and/or the contents of the skull, produced by mechanical force'' (Tandle and Keoliya, 2011).

Aetiology of THI includes road traffic accident (RTA), falls, sports and assault among others. An individual with head trauma may experience one or a combination of the following injury outcomes; scalp abnormalities, intra-cranial bleedings, skull fractures and other secondary sequelae (Adogu et al., 2015; Jamal, 2018; Uduma et al., 2015).

Early diagnosis or otherwise rapid detection of the mentioned insults is important to determine the presence and extent of the injury, aid in surgical management of the patients and to reduce any eventual secondary injuries (Itanyi and Kolade-Yunusa, 2017a).

Radiological imaging is generally the most efficient to adequately assess and establish head injury diagnosis in

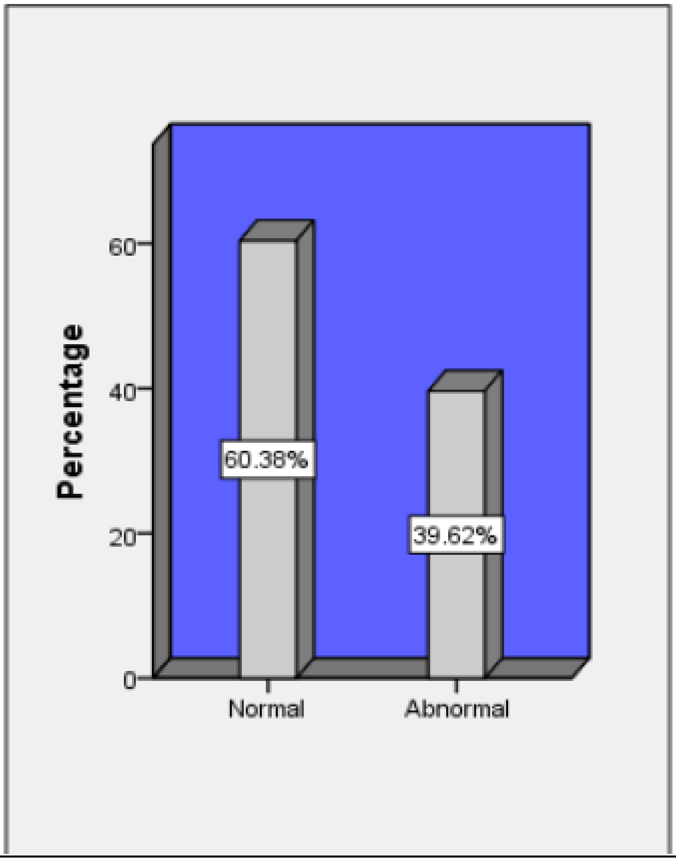

Figure 1a: Intracranial CT finding in 53 head trauma patients

acute head trauma, of which CT scan is the preferred initial work-up test (Itanyi and Kolade-Yunusa, 2017a; Uduma et al., 2015).

Among others, the advantage of CT scan include its sensitivity to detect bone injuries, acute haemorrhage, secondary comorbidities (i.e. mass effect, brain oedema, hydrocephalus, midline sift, pneumocephalus), widespread availability, fast scanning, and compatibility with most resuscitative medical devices (Jamal, 2018). Nonetheless, the usage of CT involves ionising radiation, and could also be expensive as in some settings especially in LMICs patient's access to the service is by out-of-pocket payment (Asare et al., 2019). For these reasons, there should be careful patient selection for the procedure, using critical clinical indices or guideline (Itanyi and Kolade-Yunusa, 2017a; Itanyi and Kolade-Yunusa, 2017b; Uduma et al., 2015).

Certainly, not all head trauma patients may require CT, however in patients with presentations such as worsening level of consciousness, loss of consciousness for more than 5 minutes, focal neurological findings, seizure, failure of the mental status to improve over time, penetrating skull injuries, signs of a basal or depressed skull fracture, or confusion or aggression on physical examination there would almost always a need for CT imaging procedure (Itanyi and Kolade- Yunusa, 2017b).

The TTH is the biggest hospital in Ghana's Northern hemisphere and fourth largest in the country. By its location, TTH provides healthcare services to the Northern parts of Ghana, and composite neighbouring countries including Burkina Faso and Togo. The radiology department being one of the important facilities provides a twenty four (24)-hour radiologic services including CT scans.

In radiology departments of other countries, the trends of head trauma CT findings have been studied (Adogu et al., 2015; Itanyi and Kolade-Yunusa, 2017a; Onwuchekwa and Alazigha, 2017; Tandle and Keoliya, 2011) however, in our study setting no such specific research has been conducted. Thus, there is dearth of data on patterns of CT findings in TTH, hence the need for this study. This retrospective review is therefore undertaken to report patterns of findings in patients who underwent head CT work-ups between 2016 and 2018 at the TTH.

MATERIALS AND METHODS

This is a two-year retrospective assessment of radiological reports of head CT scan in 53 head trauma patients referred to the radiology department of the TTH, from 2016 to 2018. Included patients were those identified with indication of head trauma, thus non-trauma patients were excluded in the study. All procedures were performed with a Toshiba Acquilion 128 slice CT scanner, with patient placed in supine position and scanned with a slice thickness of 5mm from the skull base to the vertex to acquire both brain tissue and bone window images. No intravenous agent was administered to avoid masking any hyperdensity which is a typical CT appearance of acute haemorrhage. The study received ethical approval from the study centre and permission to access radiological CT reports was granted.

Data entry for analysis was conducted with the IBM Statistical Package for the Social Sciences (SPSS) version 21.0 Chicago, Illinois. Analysis was done using simple descriptive statistics of percentages, and presented in tables and graph descriptions.

RESULTS

Of the 53 traumatic head CT reports, 21 (39.62%) and 26 (49.06%) of patients' sustained intra-cranial and extra-cranial injuries respectively. Conversely, normal outcomes of intra-cranial and extra-cranial structures were observed in 32 (60.38%) and 27 (50.94%) of the patients respectively (Figure 1a and 1b). Both normal intra and extra-cranial findings were commonly noted with patients of age range 21-40years than other age groups (Table 1).

Of the lesions, sinusitis (20; 76.91%), vault fractures (16; 61.54%) and facial fractures (8; 30.77%) were the three frequently reported extra-cranial injuries, as brain contusions (33.32%) and intra-cranial haematomas (52.36%) were the commonest abnormal cases for

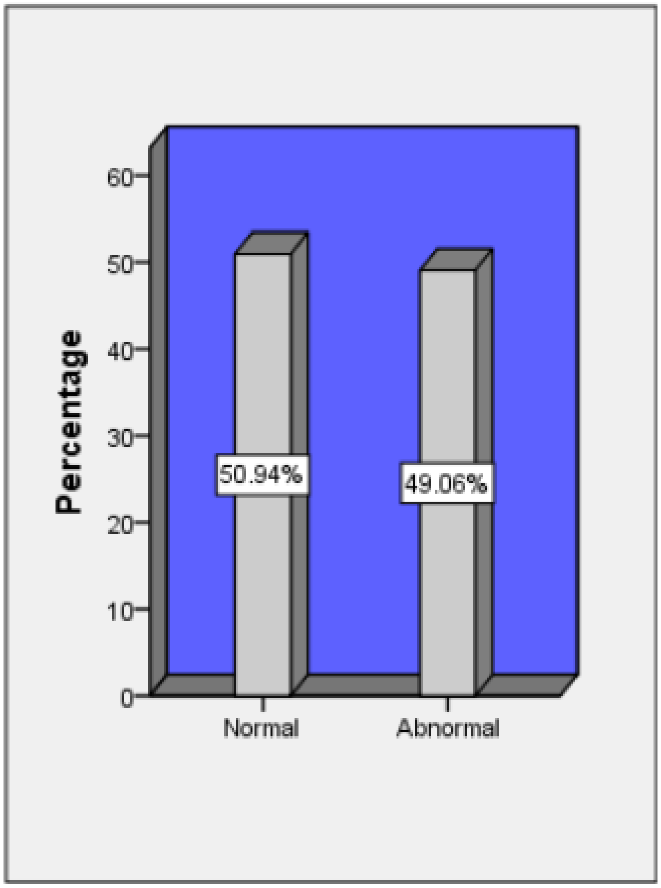

Figure 1b: Extracranial CT finding in 53 head trauma patients

intra-cranial lesions (Table 1).

The age range of patients examined was 3months to 75years.

Brain abnormalities were common in patients below or at 10years (52.36%), followed by 31-40years (33.32%). On the other hand, extra-cranial injury was highest in patients of unknown ages (88.45%), followed by 21-30years (50.00%), and the least being ≥ 61years (7.70%) (Table 1).

Male representation outnumbered females in all sex patterns analysis (Figure 2; Table 2 and 3).

In Table 3 intra-cranial injuries (brain anomalies) were mainly caused by unspecified source of trauma and next being RTA. A reverse observation was noted in extra-cranial injuries (skull/scalp anomalies).

Table 4 shows the age representation and aetiology of trauma in the 53 patients. Almost all age groups encountered RTA whereas patients in every age category experienced trauma of unspecified source. Unspecified source and RTA contributed 60.36% and 33.97% each of the total trauma sources respectively.

Table 5 shows the sites and types of skull fractures. Maxilla and walls of maxillary sinus was the commonest facial bone fracture, as also with parietal in vault fractures. Fractures whose types were not specified by reporting Radiologists accounted for 50%, and of those specified linear (16.67%) and depressed (12.50%) fractures were the commonest.

DISCUSSION

THI carries significant burden of morbidity and mortality, particularly when there is failure of prompt diagnosis and appropriate treatment to restore neurological integrity. Radiological assessment with CT scan helps to establish diagnosis and invariably determine the line of management based on work-up outcome (Ogolodom et al., 2019; Uduma et al., 2015). In regard, the present study sought to ascertain the pattern of head CT findings of trauma patients who were evaluated at a tertiary radiology department in Ghana.

The commonest specified aetiology of head injury in our study subjects is RTA, affecting almost all age groups, with preponderance in patients in their third to fourth decades. This observation is in total congruence with a previous study outcome (Akanji et al., 2015) but at slight variance with another study which though found RTA as the commonest cause but with highest incidence in those in their first decade (Itanyi and Kolade-Yunusa, 2017a). Meanwhile, in the developed setups RTA is a least contributor or source of trauma. This difference could be attributed to good enforcement of traffic rules or conformity to safety regulation, well-coordinated transportation system and good road network in the developed countries minimising risk of THI, which is the opposite in developing countries like Ghana (Ogolodom et al., 2019; Onwuchekwa and Echem, 2018; Taheri et al., 2007). Again the high incidence of RTA in our setting may be connected with the increasing motorcycle presence (a major and commonest means of transport in our locality) of which is widely identified with high rates of accident than other motor vehicles.

Noteworthy, over 60% of the trauma source was not specified demonstrating deficiencies of adequate record documentation in our environment. Nonetheless, an earlier studies have documented similar results whereby unknown source(s) accounted for the highest mechanism of trauma (Onwuchekwa and Alazigha, 2017; Taheri et al., 2007). Patient background data is important in patient treatment and management, hence Asare (2018) and Asare et al., (2019) outline ways radiology staff may adopt to enhance adequate filling of the radiological request form.

In this study, both normal and abnormal CT outcomes were noted with male preponderance. This finding is in consonance with existing literatures also observing the same outcomes (Adogu et al., 2015; Akanji et al., 2015; Jamal, 2018; Onwuchekwa and Alazigha, 2017).

The prevalence of normal or other words negative CT outcome was higher than the abnormal findings in this current research. Thirty two patients (60.38%) and twenty seven (50.94%) of the 53 reports had normal reports of no intra or extra-cranial injuries respectively. This is in disagreement with the results of Adeyekun et al., 2013,

Table 1. Distribution of CT findings by age

	Age (years)								
CT findings	**≤10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**≥61**	**Unspecified**	**Total (%)**
Normal									
Intra-cranial (n=32)	3(9.38)	2(6.25)	11(34.38)	5(15.63)	0(00.0)	2(6.25)	0(0.00)	9(28.13)	32(100)
Extra-cranial (n=27)	3(11.11)	2(7.41)	5(18.52)	6(22.22)	2(7.41)	3(11.11)	1(3.70)	5(18.52)	27(100)
Brain Abnormality (n= 21)									
Hydrocephalus	0(0.00)	0(0.00)	0(0.00)	1(4.76)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	1(4.76)
Small vessel disease	0(0.00)	0(0.00)	0(0.00)	1(4.76)	0(0.00)	0(0.00)	0(0.00)	1(4.76)	2(9.52)
Arachnoid cyst	0(0.00)	1(4.76)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	1(4.76)
Brain atrophy	0(0.00)	0(0.00)	0(0.00)	1(4.76)	1(4.76)	0(0.00)	2(9.52)	0(0.00)	4(19.04)
EDH	1(4.76)	0(0.00)	0(0.00)	1(4.76)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	2(9.52)
SAH	1(4.76)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	1(4.76)
SDH	2(9.52)	0(0.00)	2(9.52)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	4(19.04)
IPH	1(4.76)	1(4.76)	0(0.00)	1(4.76)	0(0.00)	0(0.00)	0(0.00)	1(4.76)	4(19.04)
Falx cerebri shift	1(4.76)	0(0.00)	1(4.76)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	2(9.52)
Ventricular shift	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	1(4.76)	0(0.00)	1(4.76)
Effaced ventricle	1(4.76)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	1(4.76)
Effaced sulci	1(4.76)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	1(4.76)
Cerebral contusion	1(4.76)	0(0.00)	0(0.00)	1(4.76)	1(4.76)	0(0.00)	0(0.00)	0(0.00)	3(14.28)
Haemorrhagic cont	2(9.52)	0(0.00)	0(0.00)	1(4.76)	0(0.00)	0(0.00)	0(0.00)	1(4.76)	4(19.04)
Cerebral infarct	0(0.00)	0(0.00)	0(0.00)	0(0.00)	1(4.76)	1(4.76)	0(0.00)	1(4.76)	3(14.28)
Caudate nucl infarct	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	1(4.76)	0(0.00)	1(4.76)
Total	**11(52.36)**	**2(9.52)**	**3(14.28)**	**7(33.32)**	**3(14.76)**	**1(4.76)**	**4(19.04)**	**4(19.04)**	**35(166.60)**
Skull and scalp Abnormality (n= 26)									
Facial fracture	0(0.00)	1(3.85)	2(7.69)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	5(19.23)	8(30.77)
Vault fracture	3(11.54)	2(7.69)	3(11.54)	3(11.54)	0(0.00)	0(0.00)	1(3.85)	4(15.38)	16(61.54)
Soft tissue defect	0(0.00)	0(0.00)	1(3.85)	1(3.85)	0(0.00)	0(0.00)	0(0.00)	2(7.69)	4(15.39)
Haemosinus	0(0.00)	0(0.00)	0(0.00)	1(3.85)	0(0.00)	0(0.00)	0(0.00)	5(19.23)	6(23.08)
Intra-orbital fat hern	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	1(3.85)	1(3.85)
Periorbital emphy	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	2(7.69)	2(7.69)
Sinusitis	4(15.38)	0(0.00)	7(26.92)	4(15.38)	0(0.00)	0(0.00)	1(3.85)	4(15.38)	20(76.91)
Foreign body	0(0.00)	0(0.00)	0(0.00)	1(3.85)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	1(3.85)
Scalp oedema	1(3.85)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	1(3.85)
Total	**8(30.77)**	**3(11.54)**	**13(50.0)**	**10(38.47)**	**0(0.00)**	**0(0.00)**	**2(7.70)**	**23(88.45)**	**59(226.93)**

*Co-existence of various lesions were recorded in some of the patients contributing to the more than 100%.
NB: EDH (epidural haematoma); SAH (subarachnoid haematoma), SDH (subdural haematoma); IPH (intraparenchymal haematoma); cont (contusion); nucl (nucleus); hern (herniation); emphy (emphysema).

Uduma et al., 2015 and Yusuf et al., 2014. The normal CT findings may have been higher due to two possible reasons. Firstly, a possible higher non-haemorrhagic insults which are better elucidated on MRI. Secondly, non-institutionalised head CT criteria to scrutinise head trauma patient for CT examination (Asare et al., 2019; Itanyi and Kolade-Yunusa, 2017a).

The most common extra-cranial abnormal finding

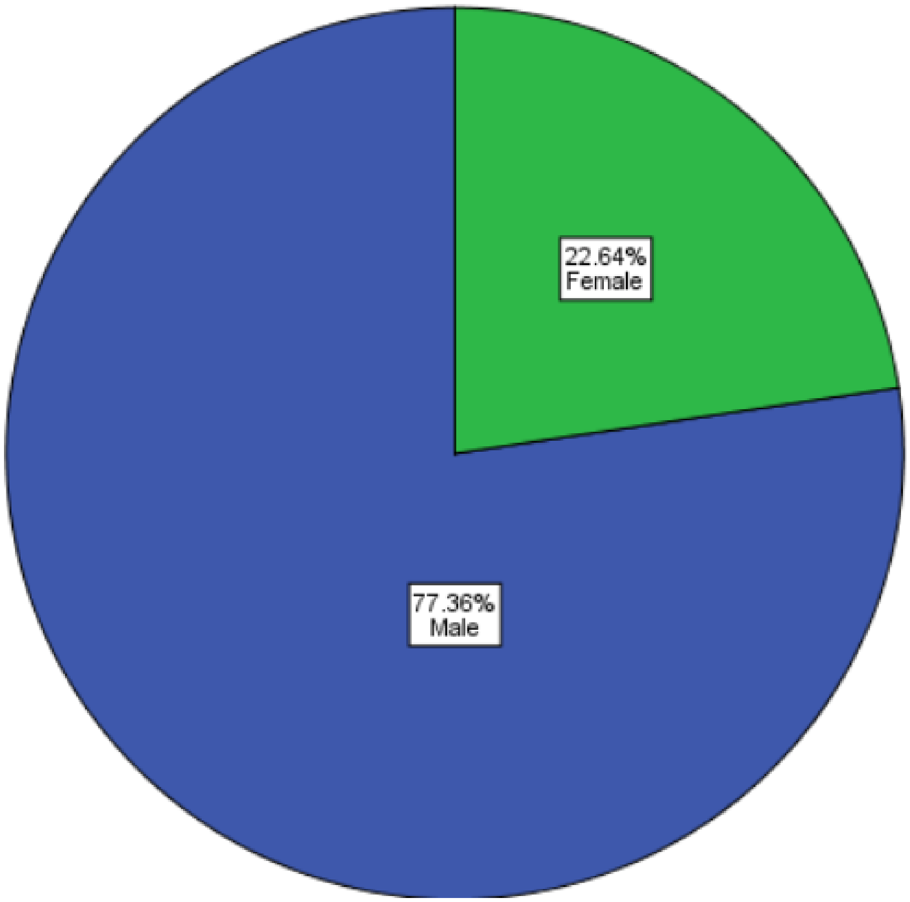

Figure 2: Sex proportion of trauma incidence

Table 2. Distribution of trauma by aetiology and age in relation to gender

Aetiology	Gender (%)		Total (%)
	Male	Female	
RTA	14(26.42)	4(7.55)	18(33.97)
Assault	2(3.77)	0(0.00)	2(3.77)
Falls	1(1.89)	0(0.00)	1(1.89)
Unspecified	23(43.39)	9(16.98)	32(60.37)
Total	**40(75.47)**	**13(24.53)**	**53(100)**
Age			
≤10	6(11.32)	2(3.77)	8(15.09)
11-20	3(5.66)	1(1.89)	4(7.55)
21-30	13(24.53)	1(1.89)	14(26.42)
31-40	5(9.43)	3(5.66)	8(15.09)
41-50	1(1.89)	1(1.89)	2(3.78)
51-60	1(1.89)	2(3.77)	3(5.66)
≥61	3(5.66)	0(0.00)	3(5.66)
Unspecified	9(16.98)	2(3.77)	11(20.75)
Total	**41(77.36)**	**12(22.64)**	**53(100)**

recorded in our work was skull fractures. Such injury may have either occurred with intra-cranial lesion(s) or independently (Itanyi and Kolade-Yunusa, 2017a), nonetheless the relationships was not analysed in this current study. A fracture on radiograph is supportive that a significant force has been applied to the bony vault; nevertheless, the lack of a fracture does not rule out injury to the underlying brain, hence a skull fracture may or not

Table 3. Distribution of CT findings by aetiology and gender.

	Aetiology (%)				Gender (%)	
CT findings	**RTA**	**Assault**	**Falls**	**Unspecified**	**Male**	**Female**
Normal						
Intra-cranial (n=32)	14(43.75)	2(6.25)	1(3.12)	15(46.88)	26(81.25)	6(18.75)
Extra-cranial (n=27)	9(33.33)	0(0.00)	0(0.00)	18(66.67)	19(70.37)	8(29.63)
Brain Abnormality (n= 21)						
Hydrocephalus	0(0.00)	0(0.00)	0(0.00)	1(4.76)	0(0.00)	1(4.76)
Small vessel disease	0(0.00)	0(0.00)	0(0.00)	2(9.52)	0(0.00)	2(9.52)
Arachnoid cyst	0(0.00)	0(0.00)	0(0.00)	1(4.76)	1(4.76)	0(0.00)
Brain atrophy	2(9.52)	0(0.00)	0(0.00)	2(9.52)	3(14.29)	1(4.76)
EDH	0(0.00)	0(0.00)	0(0.00)	2(9.52)	1(4.76)	1(4.76)
SAH	0(0.00)	0(0.00)	0(0.00)	1(4.76)	1(4.76)	0(0.00)
SDH	0(0.00)	0(0.00)	0(0.00)	4(19.04)	3(14.29)	1(4.76)
IPH	0(0.00)	0(0.00)	0(0.00)	4(19.04)	3(14.29)	1(4.76)
Falx cerebri shift	0(0.00)	0(0.00)	0(0.00)	2(9.52)	1(4.76)	1(4.76)
Ventricular shift	0(0.00)	0(0.00)	0(0.00)	1(4.76)	1(4.76)	0(0.00)
Effaced ventricle	0(0.00)	0(0.00)	0(0.00)	1(4.76)	1(4.76)	0(0.00)
Effaced sulci	0(0.00)	0(0.00)	0(0.00)	1(4.76)	0(0.00)	1(4.76)
Cerebral contusion	1(4.76)	0(0.00)	0(0.00)	2(9.52)	3(14.29)	0(0.00)
Haemorrhagic cont	1(4.76)	0(0.00)	0(0.00)	3(14.29)	3(14.29)	1(4.76)
Cerebral infarct	0(0.00)	0(0.00)	0(0.00)	3(14.29)	1(4.76)	2(9.52)
Caudate nucl infarct	0(0.00)	0(0.00)	0(0.00)	1(4.76)	1(4.76)	0(0.00)
Total (%)	**4(19.04)**	**0(0.00)**	**0(0.00)**	**31(147.58)**	**23(109.53)**	**12(57.12)**
Skull/scalp Anomalies (n= 26)						
Facial fracture	6(23.07)	0(0.00)	0(0.00)	2(7.69)	7(26.92)	1(3.85)
Vault fracture	8(30.77)	0(0.00)	2(7.69)	6(23.07)	12(46.15)	4(15.38)
Soft tissue defect	3(11.54)	0(0.00)	0(0.00)	1(3.85)	3(11.54)	1(3.85)
Haemosinus	5(19.23)	0(0.00)	0(0.00)	1(3.85)	6(23.07)	0(0.00)
Intra-orbital fat hern	1(3.85)	0(0.00)	0(0.00)	0(0.00)	1(3.85)	0(0.00)
Periorbital emphy	2(7.69)	0(0.00)	0(0.00)	0(0.00)	2(7.69)	0(0.00)
Sinusitis	7(26.92)	2(7.69)	0(0.00)	11(42.31)	19(73.08)	1(3.85)
Foreign body	1(3.85)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	1(3.85)
Scalp oedema	0(0.00)	0(0.00)	0(0.00)	1(3.85)	1(3.85)	0(0.00)
Total	**33(126.92)**	**2(7.69)**	**2(7.69)**	**22(84.62)**	**51(196.15)**	**8(30.77)**

Table 4. Distribution of trauma by age and aetiology

	Aetiology (%)				
Age	**RTA**	**Assault**	**Falls**	**Unspecified**	**Total (%)**
≤10	1(1.89)	0(0.00)	0(0.00)	7(13.20)	8(15.09)
11-20	0(0.00)	0(0.00)	1(1.89)	3(5.66)	4(7.55)
21-30	6(11.32)	1(1.89)	0(0.00)	7(13.20)	14(26.41)
31-40	3(5.66)	0(0.00)	0(0.00)	5(9.43)	8(15.09)
41-50	1(1.89)	0(0.00)	0(0.00)	1(1.89)	2(3.78)
51-60	1(1.89)	0(0.00)	0(0.00)	2(3.77)	3(5.66)
≥61	2(3.77)	0(0.00)	0(0.00)	1(1.89)	3(5.66)
Unspecified	4(7.55)	1(1.89)	0(0.00)	6(11.32)	11(20.76)
Total	**18(33.97)**	**2(3.78)**	**1(1.89)**	**32(60.36)**	**53(100)**

indicate a brain parenchyma injury (Itanyi and Kolade-Yunusa, 2017a).

Fractures of the face and vault constituted a third (33.33%) and two-thirds (66.67%) of the skull fractures respectively. The maxilla and walls of maxillary sinus were the most common fractured facial bones, as also with parietal in vault injuries. A previous study outcome corroborates with our observation, also showing higher prevalence of parietal bone fractures (Onwuchekwa and Alazigha, 2017). Additionally, our observation of the incidence of skull vault fractures being higher than facial is in consonance with other findings (Onwuchekwa and Alazigha, 2017; Sah et al., 2018).

Linear (16.67%) and depressed (12.50%) were the specified fracture types frequently documented although the highest percentage was reported unspecified (50%). An

Table 5. Distribution of site and type of skull bone fractures in the study subjects

Site	Frequency (%)
Facial	
Symphysis mentis	1(4.17)
Tempo-mandibular joint	1(4.17)
Nasal	1(4.17)
Zygomatic	1(4.17)
orbital floor	1(4.17)
Maxilla and walls of maxillary sinus	3(12.50)
Vault	
Tempo-parietal	1(4.17)
Parietal	5(20.83)
Mastoid	2(8.33)
Fronto-temporal	1(4.17)
Occipital	1(4.17)
Frontal	2(8.33)
Temporal	1(4.17)
Greater wing and pterygoid plate of sphenoid	2(8.33)
Ethmoid	1(4.17)
Total	**24(100)**
Type	
Communited	2(8.33)
Linear	4(16.67)
Depressed	3(12.50)
Communited depressed	2(8.33)
Dislocation	1(4.17)
Unspecified	12(50.00)
Total	**24(100)**

Iraqi (Jamal, 2018) and Nigerian (Yusuf et al., 2014) studies recorded similar findings, but Tandle and Keoliya (2011) contrary observed depressed fracture as the least common fracture in their research.

Apart from the above injuries, patient in our study sustained other injuries in highest frequencies, i.e. sinusitis, bleeding, cerebral contusion.

From the results head trauma occurred frequently in patients of (unspecified ages, 31-40years, ≤10years and 21-30years) and the least in 41-50years age bracket. This outcome largely corroborate the findings of other authors (Akanji et al., 2015; Sah et al., 2018; Tandle and Keoliya, 2011) but at the same time at variance with an observation by Tandle and Keoliya (2011) regarding the age group encountering the minimum incidence of trauma. Individuals with these age groups may have more energetic life and are at the top of their creativity with the tendency to take risk, alcohol intoxication, drug abuse (i.e. tramadol, marijuana) and etcetera, thereby endangering them to risk of injuries (Ogolodom et al., 2019; Sah et al., 2018).

In the age and positive CT finding relationships, greater number of the patients presenting with intra-cranial insults were less than or equal to 10years (52.36%), and lowest incidence observed in 51-60years (4.76%). In extra-cranial injuries the most affected age groups were 21-30 and 31-40years even though patients of unspecified ages recorded the highest abnormal lesions. The least incidence were recorded in 41-50years and 51-60years age groups. Our observation is largely in synchrony with earlier studies except that the age groups recording the lowest incidences are at variance (Onwuchekwa and Echem, 2018; Tandle and Keoliya, 2011; Uduma et al., 2015). This outcome suggest that young adults and children (up to first decade) are more prone to, or at higher risk of THI in our locality. Children may become victim either as a pedestrian or passenger, because it is not possible at their age they are capable of riding or driving any form of motor vehicle. It should be the responsibility of adults to supervise and protect children movement along vehicle pathways, and when travelling with them as well. Possibly there should be road attendants at accident prone areas to assist children cross roads safely; a common safety practise that safeguard children movement on roads in developed countries. Also, all faded or erased pedestrian or zebra crossing markings should be repainted to enable drivers and riders know the points of pedestrians (including children) rights of usage of roads.

CONCLUSION

In the present study, linear and depressed fractures are the most common fracture types of the skull. Furthermore, the frequently skull fracture sites are maxilla and walls of maxillary sinus of the face, and parietal bone of the vault. Also, sinusitis is a common extra-cranial abnormal finding in head trauma patient population. For intra-cranial lesions, haematomas, brain atrophy, contusions, and infarcts are the commonest injuries affecting head trauma patients in our environment.

The proportion of normal finding is disturbingly higher. Children at ≤10years and young adults (21-30years; 31-40years) experienced the maximum THIs. The male population remains the highest victim of head trauma.

LIMATATIONS AND RECOMENDATION

Images of key THIs observed in our study could not be accessed and used as figures in this paper to support readers' appreciation of the actual CT appearances of the various pathologies reported, due to crash of primary image data storage systems of the radiology department. Again, radiological reports of one of the Radiologists were inaccessible because the personal computer on which reports were typed and stored had also crashed at the time of this study data collection. Based on these, the authors recommend that the radiology department should archive patient procedure data at all times in secondary storage devices so that data can be recovered in case primary device (s) crash. Additionally, Radiologists should be provided office-based computers if they do not have at the moment, to type and store reports instead of doing so on their personal use computers.

Upon reflection, the authors concede that the sample population for the study is small, hence findings should be carefully generalised to other sites.

Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this manuscript.

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