Case Report and Series

Pattern and Outcome of Non-Incidental Injuries in Children: Reports from a Tertiary Hospital

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Abstract

Domestic accidents and the resulting injuries are major global health concerns, especially when children are affected. Household accidents result in morbidity and mortality in children but are often neglected compared to the attention given to other childhood illnesses.

This is a case series of 6 children involved in domestic accidents due to the caregivers' negligence. The patients presented at the Accident and Emergency Department of the University of Port Harcourt Teaching Hospital, Nigeria. Domestic accidents can result from falls from height leading to traumatic brain injury, which can be mild, moderate or severe. All the falls in this case series were preventable. Therefore, it is recommended that safety measures should be instituted at home and wherever children are to prevent any accident which can lead to physical injury and indirectly impact the parents, guardians and family.

Keywords: Children; Domestic Accident; Traumatic Brain Injury; Trauma.

Introduction

Domestic accidents with resulting injuries are a significant public health emergency, especially when children are involved.[1-3] They are the ninth most common cause of mortality worldwide[4,5], especially in low and middle-income countries (LMIS). Domestic accidents are also a common cause of paediatric morbidity and mortality.[6,7,8] Although there is a lack of data in several countries, especially LMIC, on trauma in children, it seems to have a direct relationship with poverty.[9,10]

Domestic or home-related accidents are unpremeditated, unintentional, and unforeseen occurrences that are highly preventable in adults and minors[1,11]. Children in Africa are threatened when they sustain injuries following domestic accidents because of the poor healthcare and trauma care facilities in most African countries. Furthermore, when trauma care facilities are available, they are not well-developed due to challenges such as under staffing, inadequate equipment and knowledge gaps.[12]

Many of these accidents and their resulting injuries at home[13-15]are caused by mechanical force, hot liquids, flames, electric current, chemicals and environmental-related factors. These factors include children playing on smooth floors, especially floor tiles, water or oil spills on the floor, unsafe balconies with fallen rails, lack of playground, sharp objects, littering of things in the home and pets.[11,16,17] Factors related to the caregivers, who may be the parents or guardians, such as distractions, poor supervision, indifferent behaviour, and unavailability of childcare services[18,19] makes the home prone to accidents.

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various injuries, such as bruises, lacerations, fractures, burns and traumatic brain injury, can be sustained from household accidents. A fall from a height of 2metres or more is considered a fall from height.[18]Fall from height is a common domestic injury leading to morbidity, including hospitalization and death. In addition, traumatic brain injury, which occurs when a force is applied to the coverings of the brain[20, 21], is a known consequence of falls from height and other domestic accidents[12, 22].

The consequences of non-intentional injuries in children affect the child, parents, guardians, and an overburdened healthcare system in developing countries.[9,11]These consequences include the economic burden as the family's financial resources will be spent on the injured child's medical bills and the loss of business and work days.[9] The routine activities of children and caregivers are also disrupted due to hospitalization and school absenteeism.[6,23,24]Household accidents can also lead to burnout of the caregiver.

Despite this enormous burden of domestic accidents in children, there is a contrasting lack of data and reports in our environment. This report is a case series of six children who had accidents in their homes and neighbourhood following negligence by the caregiver and presented at the Accident and Emergency Department of the University of Port Harcourt Teaching Hospital, Nigeria. This report is expected to contribute to local data and increase awareness among practitioners and the public on the burden of childhood domestic injuries.

Case Series

Case 1

Child A is two years old and resides on the second floor of a two-storey building with her siblings and parents. The parents left the house and kept her in the care of a teenage caregiver. While her siblings and the teenager were watching television, the child went outside the house, climbed over the balcony, and fell on the ground floor. Although the child cried immediately on examination, she was conscious. There were no external injuries on her body. Her vitals were within the normal range, with no neurological deficit, and the brain's computed tomography (CT) scan was normal. The patient was observed for 24 hours before she was discharged home.

Case 2

Child B was rushed into the emergency unit following a fall from a staircase in a duplex while the mother was discussing with her father and siblings. He is a two-year-old male. He was said to have cried at the time of the fall, and then about five minutes later, he developed generalized tonic-clonic seizures with vomiting. On examination, he was unconscious with a Glasgow Coma Scale (GCS) of 3. He received oxygen therapy and was placed on intravenous phenobarbitone and normal saline. Phenobarbitone was used to abort the seizure because it does not cause sedation compared to diazepam. The alternative anti-convulsant that would have been used is phenytoin but it was not available at the pharmacy of the Accident and Emergency Unit of the hospital where the patient presented, since it was an emergency and the patient was having seizure phenobarbitone which was available was administered to abort the seizure. A brain CT scan was normal. The patient regained consciousness about four hours after the presentation in the emergency room. He was referred to the neurosurgical unit and discharged home after three days.

Case 3

Child C is a three-year-old girl referred from a peripheral hospital following a fall from an adult bed about 2.5 metres high. Her parents went to work, and she was kept in the care of a teenage caregiver. The maid went outside the house to perform a task and found the child on the floor convulsing on her return after approximately forty minutes. On examination, the child was unconscious with a GCS of 3. The pupils were slowly reactive to light, febrile, with a temperature of 39^{o}C. A diagnosis of severe traumatic brain injury was made. The patient was referred to the neurosurgical unit and admitted into the intensive care unit. CT scan was not done due to financial constraints. Unfortunately, the patient died 48hours following admission.

Case 4

Child E is an 18-months old girl whose mother is a nursery and primary school teacher. Her mother took her along to work. She left the child on the

teacher's desk, about 25 inches in height, in the care of her pupils while she made the child's food backing them. The pupils left Child E and continued to play. The child fell from the desk with her head on the ground. The patient did not cry at the time of the accident. On examination, she was unconscious with a GCS of 3 and markedly pale. CT-Scan showed a massive intracerebral haematoma, and the urgent packed cell volume done was 5%. The neurosurgical unit saw her, and the patient died within 24 hours of admission.

Case 5

Child F is a 7-year-old male who fell from a staircase of a 2-storey building at 9.30 pm because of poor vision; the stairs were dark as there was no light bulb in the staircase. His parents moved into the house two weeks before the accident. He developed generalized tonic-clonic seizures. He was first taken to a private hospital which referred him to the index hospital. On examination patient was convulsing, febrile to touch, pulse rate was 100 beats per minute, and oxygen saturation was 99% with a GCS of 10. A diagnosis of moderate head injury was made. He was placed on intravenous phenobarbitone, normal saline, and broad-spectrum antibiotics. Brain CT could not be done due to its unaffordability by the parents. He regained consciousness 10 hours after admission. He was transferred out of the Accident and Emergency Unit to the Children's surgical ward after 24 hours and management continued by the Neurosurgical Unit.

Case 6

Child H is a ten-year-old boy who climbed and jumped over the balcony of a 2-storey building. He was experimenting with what he watched in a cartoon while his parents and siblings were watching television in the sitting room. On examination, he was conscious but vomiting. He had a bruise on his forehead. A diagnosis of mild head injury was made. He was admitted and the drugs administered were tetanus toxoid, broad-spectrum antibiotics, paracetamol, and normal saline. The bruise was cleaned and dressed. Parents could not afford the cost of Brain CT. He was discharged from the Accident and Emergency Unit after 24 hours of admission and followed up at the Neurosurgical Unit clinic.

Table 1: Type of Injury and Outcome of Non-Intentional Injury Case Series

S/N Case	Age In Years	Type of Injury	Part Of The Body Affected	Role Of Caregiver	CT-Scan Result	Outcome
1	2	Fall Climbed over balcony	No external injury	Adults not at home Teenage caregivers watching television	Normal findings	Alive
2	2	Fall from staircase	Head	Adult caregiver chatting with relatives	Normal findings	alive
3	3	Fall from bed	Head	Adults caregiver not at home Teenage caregiver outside	Not done	alive
4	18 months	Fall from desk	Head	Mother preparing child's meal	Intracerebral Haemorrhage	Mortality
5	7	Fall from dark staircase	Head	At home	Not done	alive
6	10	Fall jumped over the balcony	Head	Parents watching television	Not done	Alive

Discussion

This case series highlights six cases of domestic accidents in children. The age range of the patients in this case series is 18 months to 10 years, and the mechanism of injury in all the cases is a fall from height. The caregiver was negligent in all cases, as the children were left unattended. The CT-Scan of the brain revealed normal findings in 2 children and intracerebral Haemorrhage in one child. It was not done for three children due to financial constraints, as the children were not beneficiaries of any form of health insurance. Four of the children recovered without any neurological deficit and were later discharged home, while two children were hospitalized. Table 1 shows the summary of cases, the mechanism of injury and the outcome of the case.

Children can be victims of domestic accidents anywhere, including at home, school and the playground. Household accidents are causes of admission into the emergency department. The patients fell from a height in all the cases in this case series. In this case series of six children, five incidents occurred at home while one occurred in the classroom where the mother teaches. The results of this study are supported by a study in southern

India and southwestern Nigeria, where most children who had a domestic accident were below the age of 15 years.[25,26] The report from other series shows that children in age group 0 -5 are more susceptible to this form of injury[27] also corresponds with the results of this case series with four of the children below 5 years of age. The majority of The 0-5 age group sustains an injury while at home[2,28], as seen in this case series.

The predominant pattern of fall from a height seen in this study was also corroborated in a study from Makurdi, north-central Nigeria were fall from height was the second most typical form of injury[29]Three of the children fell from balconies of storey buildings. The reason for the fall from the balconies is in contrast to the study, where the cause of the fall was dilapidated balconies.[22]When children fall, it is due to the negligent behaviour of the caregiver as minors need to be always supervised to avoid such non-intentional injury.[26] In this study, all the children were unattended when the accident occurred. Minors, especially infants and toddlers, cannot make decisions independently; hence, they need to be guided by an adult caregiver, who usually is the parent(s), guardian, or paid caregiver (nanny, school minder, or maid). In Nigeria, sometimes the caregivers are older siblings who may themselves be minors. Two of the children in this case series were kept in the custody of a teenager.

All the children had various severity of traumatic brain injury. Traumatic brain injury is a typical result of falls.[26]Althoughthe part of the body affected will be determined by how the child fell and the part of the body the child landed with.

Morbidity and mortality can occur following domestic accidents in children.[30], In this case series, two children lost their lives following domestic accidents when they fell from a height. Death can result following a fall.[31]All the cases in this case series were preventable if the parents/caregivers supervised the children, as there was some extent of negligence on the part of the adult caregiver. Some cultures in Nigeria attribute the death of a child to some spiritually held belief that the child was not meant to live to adulthood and that death, when they occur, is a normal occurrence, spiritual and henceforth inevitable, hence the careless and lackadaisical attitude of parents toward childcare safety. For instance, in this case, the grandmother of case 3 was accused of using witchcraft and voodoo to kill the child. CT-Scan of the brain was not done in three children because the parents did not have the funds to pay for the radiological investigation. A Brain Computed Tomography Scan costs N35, 000-N60, 000 Naira, the Nigerian currency equivalent to $233 - $400. This is expensive for most Nigerian families as most people live below a dollar daily. Though most low- and middle-income countries neglect domestic accidents in children, including Nigeria, it requires adequate attention.[26]

Limitations to This Case Series

This is a series of selected cases; hence, it may not represent paediatric trauma outcomes.

Recommendations

No mortality should be neglected, no matter how insignificant it seems. This case series highlights the need for home safety measures, health promotion and cultural reorientation policies and programs to be instituted and implemented by the Government and Non-Governmental Organizations to address these non-incidental injuries arising from preventable accidents such as falls from heights.

The Nigerian government should develop the establishment of child protection services. There should be a provision of universal health coverage for all populace as most of the masses have to pay out of pocket hence delay in treatment and getting a brain CT-Scan done. More studies should be carried out to determine the true prevalence of domestic accidents in Nigerian children.

Conclusion

Accidents are a common cause of morbidity and mortality in children. These accidents can occur anywhere there is a child and is worsened if the child is left unattended by an adult caregiver. Hence home safety and supervision of children should be practised at all times as they are explorative since they may want to practice what they watched on television and do not have a good sense of decision-making as they are minors. Domestic accidents in children are highly preventable. Therefore, they should be given adequate attention as mortality can result.

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