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RESEARCH ARTICLE **OPEN ACCESS**

BLUNT TRAUMA ABDOMEN IN PAEDIATRIC POPULATION: A RETROSPECTIVE ANALYSIS

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ABSTRACT

Background: Paediatric trauma is a significant cause of mortality and disability in the age group, being responsible for more deaths than all diseases combined. The burden of child injuries in India is not clearly known due to inadequate knowledge about their epidemiology. Abdominal trauma is traditionally classified as either blunt or penetrating. Blunt traumatic injury is the most common cause of death and disability in childhood. **Objectives:** To study the demographic profile and outcome of blunt trauma abdomen in paediatric population. **Methods:** It was a retrospective study carried out at NRS Medical College, Kolkata from November 2017 to November 2020. After discharge from hospital, patients were followed for 3 months. **Results:** Total 41 blunt abdominal trauma patients were enrolled in the study. The demographic characteristics of the patients were noted. The majority of the patients were aged between 6 to12 years 53.66 %. There was a male predominance 75.61%. Tenderness of abdomen was the most common sign observed in pediatric abdominal trauma. Most common injured organ is small bowel 31.71% followed by mesentric injury19.51%, followed by splenic and liver injury. The least common injured organs were pancreas, diaphragm, stomach with 2.44%. **Conclusion:** By knowing the demography of paediatric trauma majority of paediatric injuries are preventable .Such as preventing children from playing on roads or roofs where accidents might occur. Therefore, preventive strategies should be made in paediatric patients on the basis of these demographic trends

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INTRODUCTION

Paediatric trauma is a significant cause of mortality and disability in the age group, being responsible for more deaths than all diseases combined.(1) The burden of child injuries in India is not clearly known due to inadequate knowledge about their epidemiology. According to the National Crime Records Bureau report 2006, there were 22,766 deaths less than 14 years due to injuries among children.(2) Around the world approximately one third of trauma patients have abdominal trauma and it accounts for a large fraction of loss of life and unrecognized abdominal injury remains a distressing frequent cause of preventable death.(3) Abdominal trauma is traditionally classified as either blunt or penetrating.(4) Blunt traumatic injury is the most common cause of death and disability in childhood.(5) In approximately 25% of paediatric patients with major trauma, abdominal injury is present (6,7). More than 90% of injuries in children older than one year are the result of a blunt traumatic mechanism, with the spleen being the most commonly injured organ (8,9). Children have an increased risk of sustaining injuries to intra-abdominal organs after blunt abdominal trauma due to their body habitus and relatively immature musculoskeletal system. As compared to the adults, the child's intra-abdominal organs are proportionally larger and are in relatively close proximity to each other. The small size of a child results in a greater degree of force per body surface area, which can lead to significant injury to multiple organs.(10) Moreover there is little fat or connective tissue to support the organs and the abdominal wall is less muscular, providing very little protection to the intra-abdominal contents. The incompletely ossified rib cage is also higher level thus providing limited protection to the liver, spleen, and kidneys.

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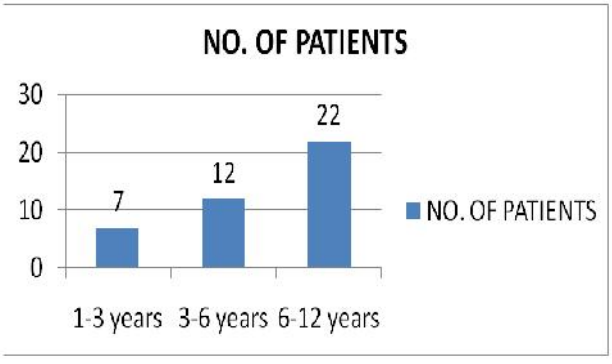
Lastly, the increased ratio of body surface area to volume results in an increased incidence toward hypothermia.(10)

METHODS

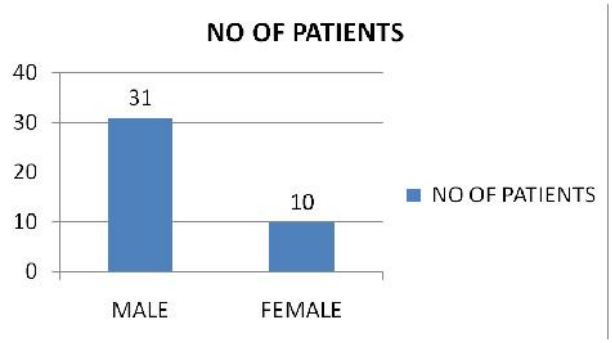
It was a retrospective study carried out at NRS Medical College, Kolkata from November 2017 to November 2020. 41 patients below the age of 12 years with history of trauma to abdomen were included in the study. The management entirely depends upon the clinical examination, hemodynamic stability and assessment of relevant investigations. Children below 12 years with history of trauma to abdomen were included and patients with death before diagnosis or who left against medical advice were excluded. Management was broadly divided into two groups i.e. conservative and operative. Conservative management in patients, with solid viscus injury who fulfilled the criteria of hemodynamic stability, CECT documented Grade I to Grade IV solid organ injuries, absence of other clear indications for exploratory laparotomy or associated injuries requiring surgical intervention , absence of associated health condition that carries any associated risk of bleeding that is coagulopathy, hepatic failure, use of anticoagulants, specific factor deficiency. This group after discharging from hospital was regularly followed up and repeated abdominal USG were done. Operative intervention was done in patients who had irreversible shock on admission after excluding other causes of shock, signs of generalized peritonitis, continuing intra- abdominal hemorrhage, clinical deterioration during observation, gas under diaphragm on abdominal X-ray, failure of non-operative management. After discharge from hospital, patients were followed for three months

RESULTS

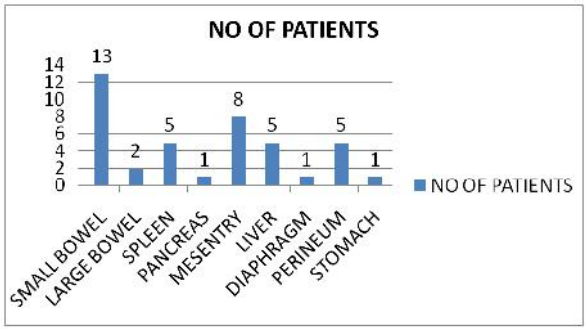
Total 41 blunt abdominal trauma patients were enrolled in the study. The demographic characteristics of the patients were noted. The majority of the patients were aged between 6 to 12 years 53.66 % (n=22). There was a male predominance 75.61% (n=31). Tenderness of abdomen was the most common sign observed in pediatric abdominal trauma. Most patients had to undergo surgery. 3 patients with splenic trauma and 4 patients with liver injury were managed conservatively. Most common injured organ is small bowel 31.71% (n=13) followed by mesentric injury19.51% (n=8), followed by splenic and liver injury. The least common injured organs were pancreas, diaphragm, stomach 2.44% (n=1). Amongst small bowel jejunum was most commonly injured. Most common mode of injury was road traffic accident 56.09% (n= 23).



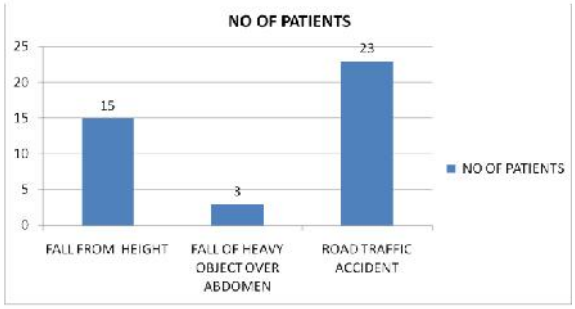
Graph 1. Age Distribution



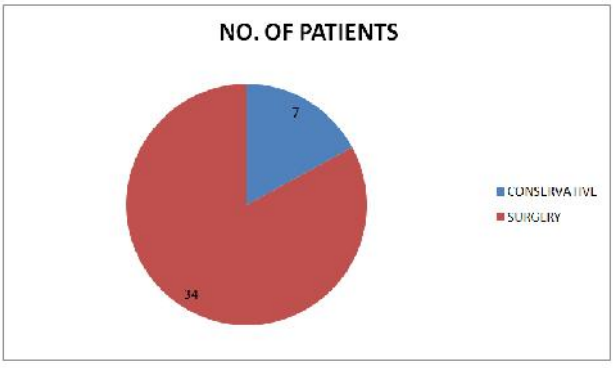
Graph 2. Gender Distribution



Graph 3. Frequency of organ injured



Graph 4. Mode of Injury



Graph 5. Type of Management

DISCUSSION

In this study, we investigated the incidence and management of blunt trauma abdomen injuries in children at NRS Medical College, Kolkata. Out of the 41 patients studied majority of the patients were aged between 6 to 12 years 53.66 % . Studies in China, Puduchery, New Delhi and Aligarh has shown this age group to be more vulnerable to injury (11,12,13,14).

The developmental stage of the child partially determines the type of trauma. The toddler with the highest curiosity to explore, investigate, and with the ability to run and walk are considered to be more prone to injuries. There was a male predominance 75.61% . Evidence suggests that across all ages, males engage in more behavior that exposes them to the risk of injury, and thus experience more injuries compared to females.(15,16) As a generalization, females spend much more time at home and do not go outside the home with the same frequency as males, which may account for the lower prevalence of injuries in them. In our study group of children with blunt abdomen trauma it was found that liver and spleen injuries were equal in frequency. Similar study was found in study by Qadri Al et al.(17)The important cause of injuries in paediatric patients is road traffic accidents, causing blunt organ injuries predominantly to the small bowel , mesentry , spleen ,liver ,followed by pancreatic injuries. The increased incidence may be attributed to increase in automobile density on the roads, crowded streets and more mechanized life. Management of blunt trauma abdomen in children has evolved with conservative management as a strategy. Laparotomy is indicated in cases of peritonitis or failure of conservative treatment as was in 82.92% patients of our study group. The incidence of paediatric blunt abdominal trauma in our study was 10% which was almost similar with an international study conducted by Ma et al.(7) However, earlier study conducted by Cooper et al reported lower incidence of 8%.(8) History taking, and proper clinical examination usually lead to accurate diagnosis at the earliest. Tenderness of abdomen was the most common sign observed in pediatric abdominal trauma . Studies conducted by Craig et al and Jerby et al had also observed the pain abdomen and clinical signs of peritonitis such as diffuse abdominal ‘tenderness and rebound tenderness as most frequently occurring signs and symptoms in pediatric abdominopelvic trauma patients.(9,10). USG is considered a preffered modality in the evaluation of abdominal trauma in children that is quick, noninvasive, repeatable and cost effective.(18,19,20) Emergency department ultrasonography performed for abdominopelvic trauma is useful as a triage tool for deciding the management and also reduces the need for CT scan.

CONCLUSION

By knowing the demography of paediatric trauma majority of paediatric injuries are preventable .Such as preventing children from playing on roads or roofs where accidents might occur. Therefore, preventive strategies should be made in paediatric patients on the basis of these demographic trends.

Conflict Of Interest- None

Funding- None

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