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BICYCLE PASSENGER INJURIES IN CHILDREN

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ABSTRACT... Objective; To find out types of traumatic injuries in bicycle passenger children. **Setting:** At PAC hospital Kamra. **Period:** From October 2005 to October 2007. **Patients & Methods:** The children between the ages of 03 to 10 years were included in this study. They were divided into two groups. First group(Gp-I) sustained injuries due to ankle or foot entrapment in rear running wheel while the second group(Gp-II) sustained injuries due to fall of bicycle, while child sitting alone either at front bar or rear luggage carrier unattended. **Results:** Gp-I sustained mostly frictional injuries ranging from simple abrasion to deep lacerated wounds of lower leg, ankle and foot. While in Gp-II severe injuries like fractures of upper and lower limbs, visceral abdominal injuries and head injuries were observed. **Conclusion:** Bicycle passenger injuries are common injuries of the children in less developed countries. These injuries range from simple "road rash' to serious head injuries.

Key words: Bicycle passenger children, road rash, grievous surgical injuries.

INTRODUCTION

Bicycle is a popular mean of transportation in less developed countries like Pakistan among middle and low socioeconomic class. This two wheeler machine has an iron bar at front and fixed rectangular frame at rear side (meant for carrying luggage but mostly used as passenger seat). Children are made to sit by parting their legs. This luggage carrier is not provided with any kind of protective devices on either side and child is directly exposed to running cycle wheel. When child gets tired his or her hanging feet accidentally entraps in running wheel of bicycle and sustains injuries of the lower leg, ankle and feet. These injuries include simple road rash to lacerations, contusions, ankle sprains and fractures of lower tibia, fibula and foot bones. Second variety of injuries is due to fall of bicycle when the second seater is left unattended; child is sitting at front iron bar or rectangular frame at rear.

Injuries include fracture clavicle, supracondylar fracture of humerus, radius, ulna, visceral injuries, head injuries with or with out facial lacerations and vulva injuries in case of female. Bicycle passenger injuries are an important cause of road traffic injuries in developing countries. These injuries when disable healthy children not only make a child suffer but also result in significant academic loss also. In our study we selected 176 children who were up to10 years.

MATERIALS & METHODS

In this study 176 patients between age groups 03 to10 years were included. They reported at Pakistan Aeronautical Complex Hospital, Kamra and District Attock. Study does not represent any specific ethnic group or area as people in armed forces are from different backgrounds and places. All children were received at emergency reception, and were registered.

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They were examined clinically; radiological examination and laboratory investigations were requested accordingly. Two groups were formed in accordance with types of injuries and each group was having 88 Patients. Group-I was studied for the incidence of injuries due to wheel entrapment and Group-II with incidences of injuries due to fall of unattended bicycle while child was mounted on bicycle. All cases were managed according to the severity of their injuries, minor injuries cases were sent home on same day after dressing, necessary medication and tetanus prophylaxis. Children with sprains and fracture were provided cotton padded Plaster of Paris back-slab and effected limb was elevated and definitive treatment carried out later on. Patients with deep lacerations of lower leg, ankle and foot were managed with debridement and dressing, few cases later on underwent with skin graft procedure. Patients with visceral abdominal injuries were mostly managed conservatively however three cases of blunt trauma of liver, spleen and one case of perforation of jejunum were operated upon .Head injuries were dealt with conservative means after assessing their nature.

RESULTS

176 children were included in this study, 71 %(125) (n=176) were male and 29 %(51) (n=176) were female. Children between age group 03 to 07 years were 53.95% (95), while 39% (69) were above seven (Table-I).

Table-I. Demographic patient's presentation

Age (years)	No of patients	Group I		Group II	
		Male	Female	Male	Female
3-5	83(47.1%)	18	19	43	3
6-8	69(39.2%)	33	3	19	14
9-10	24(13.6%)	8	7	4	5

88 children in first group received injuries due to entrapment in rear running wheel. Most involved superficial trauma such as abrasions ("road rash"), contusions and lacerations. Indeed, wheel entrapment rash could range from superficial abrasions to those involving partial or full skin thicknesses. In gravity they were having sprains, fractures of tibia, fibula and small bones of foot (Fig:-1).Among second group the incidence of fractures, dislocation of upper limb, head injuries, chest injuries and vulvar injuries were observed (Fig-2). Two children died of ruptured abdominal visceral injuries.

Fig-1. Percentage of injuries in Gp-I (n=88)

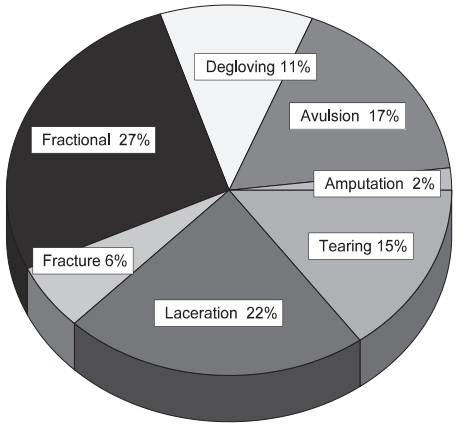

Fig-2. Type sof injuries in Gp-II (n=88)

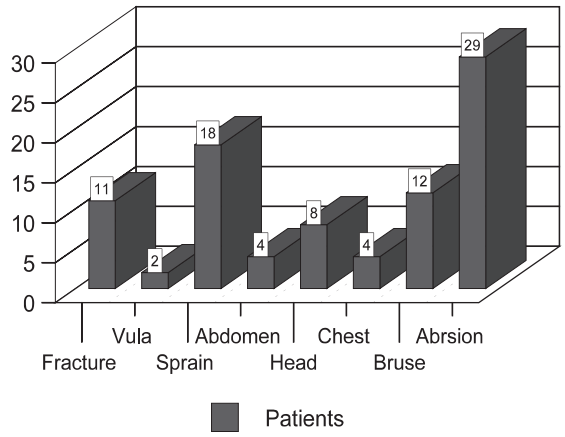

Table-II. Percentage of injuries in two groups							
Type of injuries		**Gp-I**			**Gp-II**		
	%	**Male**	**Female**	**%**	**Male**	**Female**	**Grand %**
Simple road rash / abrasions / fractional	33	21	05	10.2	06	03	19.31
Deep lacerated wounds	56	35	15	09	06	02	32.95
Sprains / fractures lower limb	23	12	09	18	13	03	21
Sprains / fractures upper limb	1.13	01	-	25	21	01	13
Abdominal visceral injuries	-	-	-	15.9	09	05	8.5
Chest injuries	-	-	-	5.68	04	01	2.85
head injuries	-	-	-	12.5	07	04	6.2
Vulva	-	-	-	3.4	-	03	1.7

DISCUSSION

Bicycle which stands for a mean of transportation in low socioeconomic folk in countries like Pakistan. Bicycle injuries made a good share in road traffic accidents, including both riders and passengers and children are the most misfortune victims and it is one of the leading cause of morbidity and mortality, in age group between 05-15 years[1,2,3]. This study addresses those cases, in which a child is mounted as a passenger either at front or rear side of the bicycle.

Two mechanisms of injuries occur, one due to running wheel entrapment and secondly due to fall of bicycle when child is left unattended. The injuries due to rear wheel entrapment, most involved superficial trauma such as abrasions ("road rash"), contusions and lacerations. Indeed, wheel entrapment rash could range from superficial abrasions to that involving partial or full skin thickness. The cycle wheel which is moving 80 rotations per minute can cause fractional, avulsion, tearing, degloving, breach in continuity of the bones and traumatic amputations of the toes[4,5]. Care full inspection of the wound is very much essential to see the depth and tissue damage in these complex sets of injuries, inadequate light can lead to missing of many important findings[6]. In our study of 176 cases, all injuries noted in Gp-I are shown in (Fig:-1). Similarly Subrahmanyam in 1990 concluded that bicycle passenger injuries can range from simple road rash to even amputation of big toe [7].

In Gp-II the injuries were due to fall of bicycle and two third children escaped from severe trauma and sustained minor types of injuries about 33% children (n=88) received serious injuries(Fig:-2).The mechanism of injuries was different from Gp-I, as injuries were due to fall and blunt trauma due to the weight of the bicycle. In these types of injuries, different regions of body may be involved. It can be either head injuries, chest trauma, visceral abdominal injuries, fractures specially limbs and axial skeletal and genitalia[8,9]. In our study the severity of head and abdominal injuries was more as compared to Cooper and associates in 1992[10]. Abdominal injuries

presented with sever morbidity and mortality, two children of ruptured liver and spleen could not make up and scrambled to death. The visceral abdominal injuries shared 4.5%(n=88) in Gp-II but they were more fatal. Likely in an evaluation study, DeRoss and colleagues noted that such kind of injuries are more dangerous and instantaneously can lead to death[11].

CONCLUSION

Bicycle passenger's injuries in children ranges from minor abrasion to sever life threatening condition like head, chest and abdominal injuries. They are associated with morbidity and mortality.

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