



# Bicycle and cycle rickshaw injury in suburban India

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## KEYWORDS

Bicycle;  
Cycle rickshaw;  
Spokes;  
Chain;  
Injury

## Summary

**Objectives:** To study pattern of injury associated with bicycle and cycle rickshaw.

**Methods:** Between June 2002 and June 2003, a hospital based prospective study was done of patients who presented with injury due to bicycle and cycle rickshaw in emergency department. Age, time of trauma, mode of trauma, contributing factors and type of injury were recorded.

**Results:** Out of total of 41 patients, 23 were injured from bicycle and 18 from cycle rickshaw. In the bicycle group all patients were either traveling on crossbar or rear fender. 91% had sustained injuries due to spokes and 83% had soft tissue injury. In the rickshaw group contributing factors to injury were traveling on rear board and school children traveling on overloaded rickshaw. 78% were injured by rear cogwheel-chain mechanism and 72% patients had only soft tissue injury.

**Conclusions:** Bicycle and cycle rickshaw injuries have a unique pattern of injury particularly affecting individuals riding them in an unconventional way. Majority of them sustained extensive soft tissue injury to leg and ankle.

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## Introduction

Cycle and cycle rickshaws are common modes of transport in third-world countries. Children traveling on overloaded cycle rickshaws (Fig. 1) and bicycles are common sights in suburban areas of

the city. The spectrum of trauma received in the health centres in such areas is hence different from those received in more urban regions.

Cycle and rickshaw injuries are low velocity injuries sustained by trapping of the foot/leg in the chains or spokes of the wheel. Hence, bony and soft tissue injuries sustained are different from that sustained by high velocity road traffic accidents commonly encountered in advanced countries.

There are few published reports of bicycle spoke injury and no published study on cycle rickshaw injury. This study aims to describe the nature of

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**Figure 1** A cycle rickshaw overloaded with school children in vulnerable position.

injury caused by a common mode of trauma which has been sparsely attended to, in the literature.

## Materials and methods

A hospital-based prospective study was done at Lok Nayak Hospital, New Delhi. This is a tertiary care hospital situated in one of the most densely populated areas of the city catering to an estimated 1.5 million population. Although patients do come to this hospital from outside this catchment area and from neighbouring states, no reliable data are available on them. The area surrounding the hospital is densely populated mostly by those of low economic status. Cycle rickshaw and bicycle are the main mode of transportation in this area.

During the study period of one year (between June 2002 and June 2003) all the patients who presented to the Emergency Department with injury from bicycles and cycle rickshaws were included. Patients who sustained injury in motor vehicle accidents were excluded. All the patients were from the immediate catchment area.

Forty-one patients presented to the Emergency Department having sustained an injury from these modes during 1 year of study. They were questioned about the exact mode of trauma, contributing factors and any treatment taken before coming to this hospital. Patients were observed for 48–72 h as

delay in actual appearance of injury is common after such trauma.

They were also clinically examined and radiographed. Injuries were divided into abrasions, lacerations, fractures and degloving injury. Open fractures were classified according to Gustillo and Anderson classification<sup>2,3</sup> for compound injuries. Epiphyseal injuries were classified according to Salter and Harris classification.<sup>5</sup>

## Results

Patients were of all age groups with a predominance of children in the 6–10 years age group. Their age distribution is given in Table 1. There were 34 males and 7 females in the study. Most of the injuries (78%) were sustained in the evening. Twenty-three were injured from bicycles and eighteen patients were injured from three-wheeled cycle rickshaws. Mode of trauma and type of injury in each group were distributed as shown in Table 2.

**Table 1** Showing age distribution of the patients

Age (in years)	Number
3–6	8
6–10	17
11–15	11
16–25	4
25–50	1

**Table 2** Showing injury classification in each group

Type of injury	Bicycle (chain)	Bicycle (spoke)	Rickshaw (chain/sprocket)	Rickshaw (spoke)
Abrasions	1	9	4	2
Lacerations		6	2	1
Fracture	1	3	4	1
Degloving injury		3	4	
Total	2	21	14	4

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