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Demographic profile of pneumothorax of chest trauma patients

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Abstract

Background: To study the demographic profile of pneumothorax in patients with blunt chest trauma.

Methods: The present study was conducted from 31th July 2018 to 30th July 2019. The study includes patients who presented with history of blunt trauma to the chest. A total of 36 patients were enrolled in the study. The patients were subjected to X-ray, ultrasound and CT scan for the diagnosis of pneumothorax.

Results: The age of patients in our study ranged from 12 years to 80 years. The mean age was 43.56 years. Most of the patients were in the range of 20-40 years (n=13) comprising 30.6% of total. Minimum number of patients were in the age group of <20 years (n=4).Out of the total 36 patients there were 21 male patients (58.3%) and female 15 patients (41.7%).

Conclusion: We concluded that chest trauma patients were young adult males.

Keywords: Age, Sex, Pneumothorax.

Introduction

Trauma cases comprises of 20-30% of all emergency medicine cases. It is one of the most common cause of death in younger population between 25-45 years of age. Management of trauma is a major challenge for the emergency staff due to the complexity and multiple organ involvement, the need to identify & early detection of the life-threatening injuries and treating them.[1]

The patients who present with trauma in the Emergency Department usually sustain injuries to the head, chest, abdomen& pelvis and extremities. Chest injuries constitute about 20% of all the trauma patients. Injuries to the chest can occur in road traffic accidents, fall from heights, sport injuries, etc. The most affected compartments include the chest wall (>50%), pleura (50%) and lungs (30–70%). Rare but often very severe are trauma of the airways (2.8-5.4%), diaphragm (0.4–1.5%), large vessels (1.1 to 2.2%) and heart (10%)[2]. Pneumothorax is a common finding in blunt trauma chest patients. Tension pneumothorax is a serious

condition that can lead to cardiac arrest and lung collapse requiring early diagnosis and urgent treatment. Small or medium pneumothorax is generally not life threatening but delay in diagnosis and treatment may result in progression to tension pneumothorax leading to respiratory and circulatory compromise in such patients.[2]

Material and method

Study design: Descriptive Cross-sectional study

Setting: Department of Radiodiagnosis, IGMC, Shimla, Himachal Pradesh, India.

Study period: 31st July 2018 to 30th July 2019.

Inclusion Criteria

Patients who presented with history of trauma to the chest.

Exclusion Criteria

1. Patients treated with open and tube thoracostomy prior to imaging.
2. Patients who were not willing to participate in the study.
3. Pregnant patients.
4. Very sick Patients.

Detailed history of the patients were taken to know the type of trauma, the severity of trauma, duration of symptoms, site of injury, socioeconomic status, etc were taken and recorded. The patients' airway, breathing and circulation were first stabilized. Then the patients were subjected to X-ray, ultrasound for the diagnosis of pneumothorax. Diagnosis was confirmed with CT scan which is the gold standard investigation for the diagnosis of pneumothorax.

Results

Table 1: Demographic data of the patients (n = 36)

Age(Years)	Mean	43.56	
	Range	12-80	
Sex	Male	21	58.3%
	Female	15	41.7%
Cause Of Trauma	Fall From Height	20	55.6%
	Road Traffic Accidents	16	44.4%

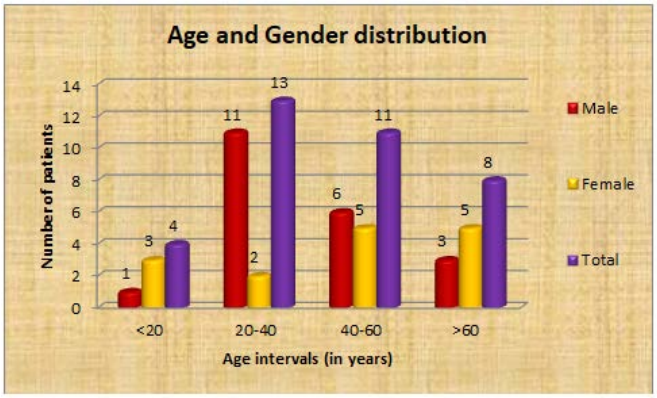
The age of patients in our study ranged from 12 years to 80 years. The mean age was 43.56 years. Most of the patients were in the range of 20-40 years (n=13) comprising 30.6% of total. Minimum number of patients were in the age group of <20 years (n=4). Out of the total 36 patients there were 21 male patients (58.3%) and female 15 patients (41.7%).

Majority of the patients(n=22) belong to the middle class (II & III) socio-economic status (according to Kuppuswamy's socio-economic status scale 2020).

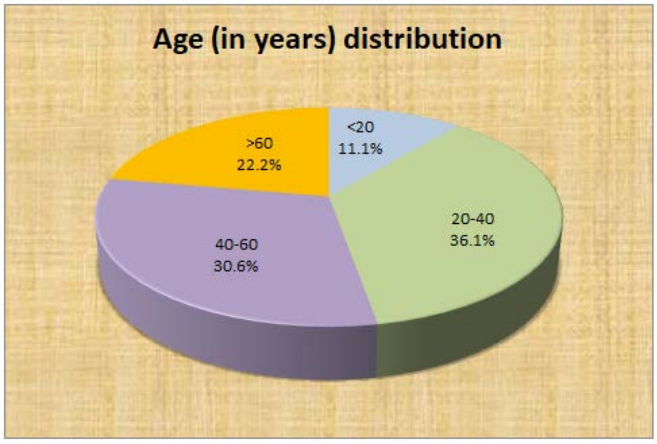
More than half of these incidents leading to chest trauma occurred in the rural areas.

Table 2: Age and Gender distribution

Age (in years)	Male	Female	Total
	n(%)	n(%)	n(%)
<20	1 (4.8%)	3 (20.0%)	4 (11.1%)
20-40	11 (52.4%)	2 (13.3%)	13 (36.1%)
40-60	6 (28.6%)	5 (33.3%)	11 (30.6%)
>60	3 (14.3%)	5 (33.3%)	8 (22.2%)
Total	21	15	36

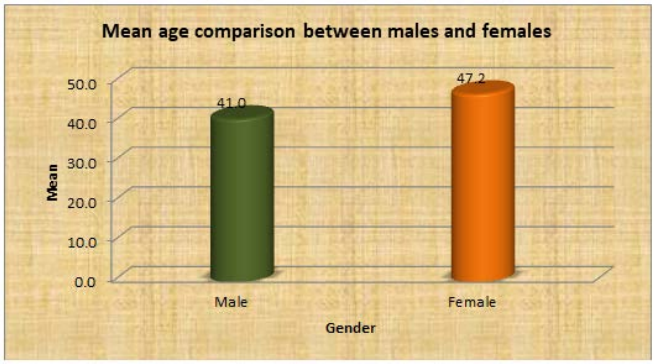


Graph 1



Graph 2

Table 3: Mean age comparison between males and females



Graph 3

Discussion

In our study of 36 patients, the mean age was 43 years with most of the patients were in the age group of 20-40 years. Also males were more common than females with 21(58.3%) were males and 15(41.7%) were females. Stefania Ianniello et al.3 in their study on sonographic diagnosis of pneumothorax in major trauma found that the mean age of patients with chest trauma was 25 years with males more common than females. Mao Zhang et al.4 studied 135 patients with multiple trauma treated in the emergency department and found that the mean age of patients with chest trauma was 45 years and males more common than females. Our Study is in agreement with these studies with chest trauma being more common in young adult males. Khaled Morsy Salama et al.5 in their study on role of bedside sonography in the assessment of patients with chest trauma found that Motor Car Accident was the most common cause of chest trauma (68%). Yassir Abdul Rahman et al.2 in their study on 305 patients with blunt trauma to the chest reported that the most common cause of blunt trauma chest was Motor Vehicle Accident. In our study of 36 patients, we found that the most common cause of blunt chest trauma was fall from height (55.6%) and Road Traffic Accident being the 2nd most common (44.4%). This is not in concordance with the previous studies as described above. The most probable explanation is because of the terrain and geography of the region where our hospital is located being a mountainous region with steep landscape in the Himalayas. Majority of these incidents leading to chest trauma occurred in the rural areas. This is most likely due to the steep geographical area of the region, poorly constructed and insufficient lightings of the roads in the rural areas as compared to the urban.

Conclusion

Chest trauma constitute one-third of the cases hospitalized due to trauma6. Until the age of 40 years, chest trauma constitutes 20-25% of the causes of deaths and the mechanism of injury is blunt trauma in 70% of the cases7. We concluded that patients with blunt chest trauma developing pneumothorax are most common among young adult males. The most common cause of blunt chest trauma developing pneumothorax is Motor Vehicle Accident in cities/towns with increasing numbers of vehicles and automobile users as described by various studies2,5. However, in mountainous and hilly regions with steep geography, the most common cause of blunt chest trauma is fall from height, which occurs more commonly in the rural

areas as compared to the urban. This study has few limitations. This study included a smaller number of patients and in smaller hospital settings. It selected patients who were more severely injured than patients who may only receive a chest radiograph without undergoing CT scan which may have led to some selection bias.

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