

Audit of Occupational Hand Trauma Presenting in the Accident and Emergency Departments of two Major Hospitals

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A study was carried out in 31 patients presenting with occupational hand trauma in Accident and Emergency Departments of two General Hospitals of Lahore. All of the patients were males and 39% of them were below the legal working age (<18 years), 32.26% were illiterate. More than 55% had no training prior to the job and 58% of the patients had to work for more than 8 hours a day. Sixty one percent of the work places lacked arrangements for first aid, protective clothing or fire extinguishers. Seventy five percent of the patients required admission. Right hand was involved in 58% of patients. Radiographs were carried out in 74% of the cases, 65% showed positive findings. Wound toilet was done in 87%. Eleven patients were referred to Orthopaedic and one patients to Plastic Surgery. Post operative infection was seen in 22.6% and amputation done in 10% of the patients.

Key words: Hand/Occupational Trauma

One of the increasingly common aetiology of hand trauma is in the industrial occupation¹. In developing countries like Pakistan, industrial development has taken place at the expense of safety precautions. Prosecutions are non-existent and penalties few. This is a result of ambivalence in man's quest for safety. Knowledge, understanding and training are required to guard against the industrial hazards².

In Accident and Emergency Department management of hand injuries poses a challenge to all surgeons. Such cases are initially dealt with junior and relatively experienced surgeons. It is this early management on which successful outcome of secondary procedure rests³.

Material and Methods

The study was carried out over a period of five months. Only those patients who had isolated injuries to hand including wrist injuries while on work were considered. No discrimination of age and sex was done.

The nature and management of hand injuries on work were studied. Working hours, safety precautions and medical allowances offered by the factories were also looked into. Patient's level of education, skill and delay before presentation were noted. Work place of patients were visited and Emergency arrangements examined. The workers were asked about their satisfaction with on job training and supervision.

Patient's data was collected from two general hospitals in Lahore i.e. Mayo Hospital, Lahore and Social Security Hospital.

The draining area of Mayo Hospital serves a substantial textile and agricultural industry. There is a large working class community belonging to a below average income group.

Social security hospital is a tertiary care centre for factory workers from all over Punjab. The treatment is covered by their health insurance.

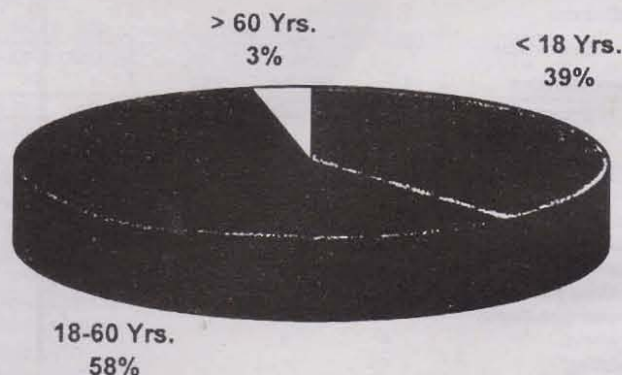
Hand injuries have been classified according to the mode and presentation of injury. Trauma was deemed more significant if deeper tissues including tendons, vessels, nerves or bones were also damaged⁴. Tetanus prophylaxis was given to all the patients. Analgesics and antibiotics were prescribed on merit.

Results

There were 31 cases in the study, 45% were referred from other hospitals and dispensaries, 20% got first aid prior to hospital admission, 35% were self-referrals.

All the patients were males which can be explained on the fact that very few women are employed by the industrial sector.

Fig.1 shows the age distribution of attending patients.



Thirty nine percent of the patients were below 18 years of age (youngest being 14 years), 58% were between 18-60 years, while 3% were above 60 years of age (oldest 68 years). Patient presentation to the hospital was divided into three categories. Majority of the patients (61.3%) presented early (<8 hours), while 35.5% presented late (>24 hours). Delayed presentation (8-24 hours) was seen in one patient.

The patients presenting late either belonged to a far off area or were those who suffered minor trauma which later on got complicated.

Occupational profiles are listed in table 2, with manual workers making up 96.8% (30/31) of the total patients. Thirty eight percent of the patients were below the working age of 18 years.

Table 1 Type of work

Unskilled	Semi Skilled	Skilled
45.16%	38.71%	16.13%

The level of education among the patients varied from illiterate to bachelor degree holders. These can be broken up into 4 groups. Thirty two percent were illiterate, 48% were educated upto primary school, 13% were high school graduates and only 7% studied beyond high school.

Table 2. Occupational Profile

Textile	Shredder (Toka)	Chain Saw	Press	Office worker	Misc.
10	3	3	4	1	10

Most of the patients working on shredder (Toka) and chain saw were illiterate and had to work for more than 8 hours per day.

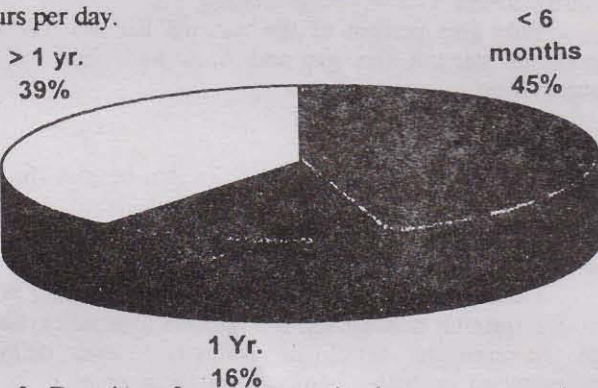


Fig. 2: Duration of employment in the same occupation prior to injury

These included provision of first aid in 25.8%, fire fighting equipment in 29% and protective gear in 12.9%.

Sixty one percent of the work places had no such first aid facilities.

Fifty four percent (54.34%) patients had no on job training, 9.68% considered their training as poor, 29.03% considered it adequate and 6.45% of the patients had good training. Work hours ranged from 8 hours to maximum of 16 hours. About 42% of the workers worked for 8 hours/day, while only 13% worked for more than 12 hours/day.

One patient with extensive burn injury of both the upper limbs required transfer to plastic surgery unit for skin grafting.

Eleven patients with severe injuries involving bones were referred to orthopaedics from A&E Department. Eight of them had traumatic amputation, two patients had

fracture dislocation of phalanges for which K-wiring was done, while one patient had extensor digitorum tendon repair.

There were 8 cases of traumatic amputation of which 3 were clean cut injuries. Reimplantation was not attempted in any of them because of multiple factors such as lack of expertise and necessary equipment.

Fig. 3 Working hours in patients of hand trauma.

Table 3 The nature and severity of injuries are listed in.

Nature of Mechanism of Injury	No. of Patients
Blunt trauma	16
Sharp trauma	10
Crush	10
Deep cuts	9
Fractures	10
Traumatic amputations	8
Degloving injury	6
Abrasions & minor lacerations	5
Muscles & tendon injury	3
Burns	2

No nerve or vascular repair was done. Three tendon repairs were carried out successfully by general surgical unit.

Isolated digit injuries accounted for one third of these, while thumb was involved in one tenth of digit injuries. In 58.06% only right hand was involved. Left hand injuries accounted for 32.26%, while 9.68% injuries were bilateral.

Management

Routine investigations (CBC, Blood sugar, Blood urca and urine C/E) were done in 61.3%. Radiographs were taken in 74% of the cases, of which 65.2% had positive finding (i.e. a fracture).

Table 3 shows the management of hand injuries. Eleven cases (35.5%) were referred to orthopaedics and one (3.23%) to plastic surgery.

Sixty one percent (61.3%) patients had no post operative complications, while infection who observed in 22.6% of the cases. Two of the patients developed gangrene of the skin and one patient had gangrene of a digit. Residual deformity was seen in two patients. These

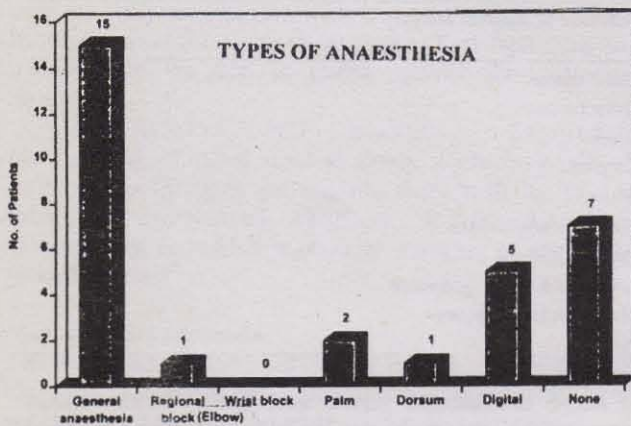
Occupational Hand Trauma

were postburn contracture in 1 and weak thumb adduction in the other.

Table 4: Management of hand injuries

Management	No. of Patients
Wound toilet	30
Antibiotics	27
Elevation/Sling	18
Debridement	18
Suturing	12
Skin grafting	10
Backslab	7
Drain/explore	3
Amputation	3
Manipulation/K wiring	2
Bone refashioning	2
Tendon repair	2
Referred to Ortho.	11
Referred to Plastic	1

Anaesthesia type used in managing these cases.



Nineteen patients (61.3%) were treated by General Surgical Unit; 11 by orthopaedics and one patient was dealt by plastic surgery team after referral.

Twenty five percent of the patients were discharged the same day from A&E Department, while 75% were admitted. Mean hospital stay was 3.6 days.

No patient was referred directly to Occupational Therapy Center. As Hand Clinics are non-existent follow up was carried out by respective departments.

Eight of the 31 patients received no further follow up and were asked to consult respective general practitioners for dressing and stitch removal.

Discussion

A patient with hand injury presents a triple challenge; his welfare, general nature of the wound, and the specific

hand structures injured. Such injuries need not just a surgical technician but physician who is surgically competent⁵.

A proper assessment of injury is a must especially at the primary care³. Precious time can be saved by creating patient awareness and improving medical facilities. Workload in A&E Department can be decreased by general practitioners working in the periphery⁶.

A high postoperative infection (22%) was probably due to late presentation of contaminated cases; inadequate management in the periphery and inexperienced surgeons in A & E Department with limited available resources in the operation theatre.

As regards the workers in the industrial sector, most of them were found to be poorly trained for the job. Some were set to work on machines of which they had no experience. Most of the workers had no idea about the medical benefits they were entitled to prior to injury. Twenty five percent had no medical cover, 30% of the workers were illiterate and 39% were below the legal working age. Again 58% of the workers had to work for more than 8 hours per day without overtime payment.

Most of the hand injuries (45%) occurred in patients recently employed (<6 months). Contrary to the Western Society none of the workers ever drank and only 30% were smokers.

Fifty five percent of the patients had no training prior to starting the job and 65% had little or no supervision.

Conclusion

This study differs from other studies that besides the in-hospital management of occupational hand trauma patients, it also highlights its etiology and the apathy prevailing in our industrial sector.

Under-aged workers, long working hours and poor on-job training predisposed the patients to injuries. Lack of attention to detail in emergency and delayed presentation were the factors effecting outcome of hand trauma.

Need of the hour is to realize our responsibility to the society and work towards prevention of negligence in the industrial sector.

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