

Disabilities Following Industrial Hand Injuries

DR. NAVNENDRA MATHUR, DR. K. K. R. SHARMA, SENIOR SPECIALIST
Department of Orthopaedics, E. S. I. Hospital, Jaipur

Consecutive 483 cases of industrial hand injuries attending Employees' State Insurance Hospital, Jaipur from 1983 to 1985 have been studied. The incidence of injuries is approximately 40/10,000 workers per year, caused mainly by entrapment of hand in active machine (47%), during lifting and transportation of heavy objects (28%), and handling tools (12%). These injuries are serious enough and results in persistent residual deficit in 59% of cases.

INTRODUCTION

In developing countries the industrial regulations ensuring safety to the workers are hardly implemented. As a result, the incidence of industrial injuries is likely to be high. Further, improperly organised health care delivery system often compounds the issue and leads to excessive disabilities.

Jaipur, a city of 1.2 million population having small and medium scale industries, has a population of 42,900 workers covered by the Employee's State Insurance Scheme (E.S.I.S.) There are 9 dispensaries catering to the members, who are beneficiaries of the scheme. All injured patients needing specialists care and hospitalisation are referred to central hospital.

Present study was undertaken from 1983 to 1985 to evaluate the industrial hand injuries in the central hospital.

MATERIAL AND METHOD

Consecutive 483 cases of industrial hand injuries attending the Department of Orthopaedics, Employees State Insurance Hospital, Jaipur were evaluated for the following:—

1. Incidence, type and pattern of industrial hand injuries.
2. Permanent physical deficit and disability to the workers following injuries.

OBSERVATIONS AND RESULTS

Age Incidence

The percentage distribution of the industrial workers in the different age groups is based on the available census records (Census 1981). The percentage distribution of the injured workers studied according to their age groups. It is revealed that 32 percent of the workers population belonging to 18-25 years age group had 38 percent of the injuries. The percentage of incidence is low in 36-45 years age group, wherein 23 percent of workers suffered 17 percent of injuries. The incidence of injury in other age groups is commensurate with their percentage distribution in the worker population (Table No. 1).

Table No. 1 Age incidence

Age group (in years)	Number of injured workers	Percentage distribution of workers	Percentage of injured workers
18-25	185	32	38
26-35	195	41	40
36-45	80	23	17
46 & above	24	4	5

Mechanism of Injuries

As for the mechanism of injury, entrapment of hand in active machine was the cause of

injury in 47% and during lifting and transportation of the heavy object in 28%. Rest of the patients sustained injury during handling of tools (12%) and other miscellaneous modes (13%).

Type of Injuries

The injuries are divided into simple and grievous injuries on the basis of their healing period and persistent physical deficit after their treatment.

Simple injuries (55%) were those which healed within 4 weeks, with little or no persistent physical deficit whereas grievous injuries (45%) took more than 4 weeks to heal and always resulted in persistent permanent physi-

cal deficit.

Majority of simple injuries included lacerated and incised wounds (32%) involving the index and middle fingers, whereas traumatic amputations (20%) and fractures (10%) constituted majority of grievous injuries again involving index and middle fingers (Table No. 2 & 3).

Disabilities

There is a medical board that finalises the compensation for the persistent physical deficit on the guidelines laid down by the E.S.I. Corporation and American Academy of Orthopaedic Surgeons.

Table No. 2. Simple injuries

Type of injury	Digits						Total
	Thumb	Index	Middle	Ring	Little	Hand	
Subungual Haematoma	3	6	11	3	1	—	24 (5%)
Superficial Skin Loss	9	29	22	10	4	1	75 (15.5%)
Lacerated & Incised Wound	37	77	72	29	27	22	264 (54.6%)
Nail Loss	13	29	27	12	3	—	84 (17.4%)
Superficial Burn	—	—	1	1	1	—	3 (.6%)
Foreign bodies	1	1	—	—	—	1	3 (.6%)
Total	63	142	133	55	36	24	453

Table No. 3. Grievous injuries

Type of injury	Digits						Total
	Thumb	Index	Middle	Ring	Little	Hand	
Extensive Skin Loss	8	26	19	14	6	—	73
Fracture-closed	9	1	7	6	2	4	85
Compound	7	16	10	12	8	3	37
Tendon Injury	4	18	7	8	—	—	10
Neurovascular Injury	4	5	—	—	—	—	161
Traumatic Amputation	12	61	43	31	14	—	161
Total	40	126	91	71	30	7	366

Table No. 4. Persistent physical deficit (percentage wise) in relation to body

Digit	Total digit loss	Loss distal to P.I.P. joint	Loss distal to D.I.P. joint	Loss of tip without bone loss
Thumb	30	20	—	7
Index	14	11	9	5
Middle	12	9	7	4
Ring	7	6	5	2
Little	7	6	5	2

Disarticulation of wrist accounts for 60% of disability in relation to body. Functional deficit due to sensory deficit constitute half the percentage of the loss of the part (Table No. 4).

Table No. 5. Persistent physical deficit
Total cases finalised by Medical Board—348

Disability (in percent)	Number of patients	Percentage
Nil	146	41
1	6	2
2	22	7
3	12	3
4	25	8
5	31	9
6	7	2
7	13	4
8	5	1
9	33	9
10	8	2
More than 10	40	12

DISCUSSION

The incidence of injuries is higher in younger age group (18 to 25 years) may be because of lack of training, experience, carelessness and

exposure to the work which is more prone to injuries (Page, 1975).

Majority of these injuries (47%) are caused by entrapment of hand in active machine, prevention of which requires careful designing of safety devices and strict implementation of safety rules to keep them minimum. On contrast, injuries following lifting and transportation of heavy objects can be substantially reduced by the use of proper equipments, right methods and keeping the floor clean and greese free.

The incidence of injury is substantially higher in index (28%), middle (28%) and thumb (13%) because these digits are involved in three-point pinch, commonly used to face the machine or to hold the objects near the tools. Goldwyn & Day (1969) and Page (1975) found high incidence of injuries in index and thumb. 30% of cases suffered injury to more than one digits as compared to 15% cases of Goldwyn & Day (1969).

59% of these injured cases suffered persistent physical deficit (P. P. D.). 47% of cases suffered 1 to 10% and 12% suffered more than 10% of deficit.

Thus the agony suffered by the worker is tremendous both physically and economically. It also affects the national economy through compensation paid to workers, man-hour lost and the loss of production.

This can be reduced by strict implementation of safety rules, immediate and proper medical care of the injured and highest degree of rehabilitation training.

It is high time a thought should be given to this, otherwise we will go on loosing our skilled workers.

REFERENCES

1. Goldwyn, R. M., Day, L. H., "Acute Industrial Hand Injuries: A Socio-Medical Study," Plastic and Reconstructive Surgery, 44, 567-575, 1969.
2. Page, R. E., "Hand Injuries At Work: (An Analysis of Patients Attending Hospital)", The Hand, 7:1, 51-55, 1975.