Original Article

Hand Injuries in Paediatric Age Group

[1]Olaitan P.B and [2]Ogbonnaya I.S;
[1]Former address: National Orthpaedic Hospital, Enugu, Nigeria
Present Address: Ladoke Akintola University of Technology Teaching Hospital, Osogbo, Osun state, Nigeria
[2]Department of Plastic Surgery, National Orthopaedic Hospital, Enugu, Nigeria

Abstracts

Background: Hand injuries in children are not uncommon presentation to hospitals. Reports of the aetiology of these injuries are rare in this environment. Knowledge of these will help in finding means of preventing the injuries.

Patients and Methods: A retrospective review of hand injuries seen and managed in our centre over a five year period is presented. Sources of the information were the case notes of the patients as well as the operation and Trauma Registers.

Results: Grinding machine was the most common cause of injuries in 38.5% followed by falls from heights in 30.8%. Aetiology of the hand injuries varied with age. In the 0-2 year-age group scalds predominate; burns, falling of heavy objects on the hands, cuts from sharps, door injuries and bicycle chain in the age group 3-6 years while in the age group 7-10, sharp objects like knife and glass, fall from heights, falling of heavy objects on the hands, scalds, doors and grinding machines were the sources of injuries.

Conclusion: Most hand injuries in children are preventable in nature. Emphasis on education of parents as well as the children is advocated towards reducing the present trend of hand injuries in children.

Key words: Paediatric, hand injuries, management, prevention.

Introduction

The hand is easily involved in accidental injury, ranging from skin avulsion, lacerated tendons, burns, to amputation. Although not commonly involved in economic activities, children sometimes sustain injuries to the hand from domestic accidents and occasionally from sporting activities[1]. The nature of these injuries therefore range from minor household or domestic injuries to severe crush[2], when the hands are subjected to industrial accidents and sometimes in traffic accidents in the course of daily activities[3].

Knowledge of the epidemiology of the hand injuries is therefore important in defining a program aimed at reducing these injuries. Prevention of these injuries will be possible only when the different aetiological factors are known in the different age groups; hence this review.

Patients and Methods

A retrospective review of hand injuries in children (<14 years old) managed from January 1996 to December 2000 at the National Orthopaedic Hospital, Enugu, Nigeria was carried out. Sources of information included the trauma and operation registers as well as patients' case notes. Data collected include the age, sex, hand dominance, occupation, sources of injuries, specific hand involved and parts of the hands involved in the injuries. Time lags between injuries and presen-

Correspondence:
Dr. P. B. Olaitan, Dept of Surgery, Ladoke Akintola University of Technology Teaching Hospital, Osogbo,

Copyright © 2005 African Journal of Paediatric Surgery
Published by Child Health Ventures

tation, modes of treatment, surgical procedures as well as the complications were extracted from the case notes. The results were collated and descriptive analysis was carried out using SPSS version 11.

Results

There were a total of 190 patients with acute hand injuries, 28.9% (55) of whom were aged 4 months to 14 years with a mean age of 2.1 years. Of the children, 32 were males and 23 were females (M:F ratio of 1.4:1). Of these 55 children 42 (76.4 %) were right handed, 6 (10.69 %) were left-handed while the hand dominance of 7(12.7%) were not stated.

Table 1:
Age distribution of patients with hand injuries

Age group (years)	No. of Patients	(%)
0 - 2	17	30.9
3 - 6	12	21.8
7 - 10	13	23.6
11 - 14	13	23.6
Total	55	100

Table 2:
Parts of hands involved in injuries.

Parts of the hand	Number Affected	(%)
Middle finger	12	24.5
Index finger	10	20.4
Ring finger	6	12.2
Little finger	3	6.1
Thumb	5	10.2
Thenar eminence	3	6.1
Hypothenar area	1	2.0
Palm	1	2.0
Dorsum	7	14.3
Wrist	1	2.0
Total	49	100

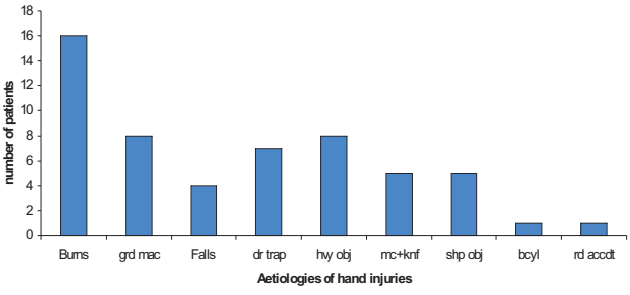
The right hand only was involved in 37(67.3%), the left in 16(2.9%) and both hands in 2(3.6%) patients. The injuries occurred in home environment in 45(81.8%), outside the house in 6(10.9%), and industrial in 4(7.3%) patients. Burns constituted the largest (29.1%) cause of hand injuries, followed by injuries from grinding machines and fall of heavy objects in 8(14.6%) patients each. Banging of house and car doors against the hands were seen in 7(12.7%) of the patients while matchet and knife cut, and other sharp objects like glasses and broken bottle were responsible for the injuries in 5(9.1%) patients. One (1.8%) patient each sustained hand injury from bicycle chain and road traffic accident (Table 2).

Table 3:
Surgical Procedures carried out on injured hands

Procedures	No of Patients	(%)
Debridement+Dressing	17	30.9
Primary closure	10	18.2
Split skin grafting	6	10.9
Full thickness skin grafting	1	1.8
Groin flap cover	2	3.6
V-Y Advancement volar flap	2	3.6
Debridement + K-wiring	6	10.9
Stump refashioning	2	3.6
Tendon repair	2	3.6
Partial amputation	5	9.1
Below elbow amputation	2	3.6
Total	55	100

The age group 0-2 years was the most frequently affected accounting for 30.9%. Other age groups were essentially affected equally (Table 1). Fourteen (82.4%) of the 17 children aged 2 years or below, had burns from hot paps, soup, hot oil and pressing iron. Causes of injuries in the age group 3-

Fig. 1: Aetiologies of hand injuries/number of patients



Copyright © 2005 African Journal of Paediatric Surgery
Published by Child Health Ventures

6 ranged from doors, knife cuts, falling of heavy objects on the hands, burns to bicycle chain injuries, with equal frequency.

Among the age group 7-10years, sharp objects like knife and glass constituted 46.2% of the injuries, followed by fall from height (15.4%), as well as others like falling on heavy objects, grinding machine injuries, scald, door injuries each with one (7.7%) patient.

Grinding machine was the most common cause of injuries in 5(38.5%) of the13 patients in the age group 11-14 years. This is closely followed by fall from heights (30.8%) , glass and matchet cuts (23.1%) and door injuries(7.7%) patients.

The different parts of the hand injured were as shown in table 3 with middle finger being most injured (12 digits), followed by the index finger (10 digits), the ring finger (6 digits) and 5 thumbs. The dorsal surface of the hand alone was injured in 7 hands, while the palm, the wrist and the hypothenar regions were affected in 1 patient each.

Procedures carried out on the involved hands included debridement and dressing only (17 patients), primary wound closure (8 patients), and stump refashioning (7 patients). Six of the patients had only split thickness skin graft cover of their wounds while debridement with k-wiring was done in 6 other patients. Two of the patients had tendon repair while 2 patients who had their crushed hands badly managed by traditional bone setters and developed gangrene of the hands had below elbow amputation.

Complications observed in these children included stiffness (8 patients), partial loss of digits (6 patients), hand deformity (3 patients), gangrene and amputation (I2 patients), and hypopigmentation in one patient.

Discussion

Our finding agrees with other report that hand injuries in children commonly of domestic origin with no gender predilection[4]. In the older age group, however there tends to be a male preponderance in this report as in other report1.There is variation in the aetiology of hand injuries in this report depending on the age group. Scald injuries predominate in the very young age group, while sharp objects were the main causes of injury in the older child. As the children approach adolescence, injury from grinding machine becomes most common. The difference in the aetiology of hand injuries in the different age strata is due to the varying exposure of these children. For example the toddlers in ages 0-2 years are likely to touch anything around them, e.g. hot tea, paps, soup, thereby spilling these on themselves. This could explain the high level of scalds in this age group. The adventurous older child who plays with sharp objects is more likely to experience cuts, laceration or penetrating injuries. The children in the 11-14 year-age group are likely to be involved in helping parents both at home and in their small business enterprises. Many of these children sustained injuries at parents or guardians' factories, from machines. Jenyo et al reported that children are often exposed to hazards engine belts when they go to grind pepper or yam flour; and to road traffic injuries when they hawk food by the roadside[3]. Others sustained injuries as a result of falling from top of trees and sports at school, while the younger ones sustained scald, door trap and objects falling on their hands at home.

Most of the injuries in this study were sustained at home, the number of injuries sustained outside the house tend to increased with age. In a report by Larsen et al hand injuries had the highest peak incidence in teenagers, and were mainly domestic and leisure accidents in nature[4]. A study from Saudi-Arabia showed that most hand injuries were domestic and caused by doors, and were therefore

Copyright © 2005 African Journal of Paediatric Surgery
Published by Child Health Ventures

preventable[5]. Household domestic appliances are often sources of potential hazard for young children[6].

Prevention of hand injuries in paediatric patients calls for education of both the parents and the children. Strict and close monitoring of very young children by older people in the house is necessary to prevent domestic hand injuries like burns, knife and matchet cuts. Hot foods and soup should not be left at the floor level where toddlers could easily reach. Children should be under the watchful eyes of adults while having sports. Cooking without supervision by young children should be avoided. Child labour or allowing children to operate heavy machines should be discouraged.

We believe these preventive measures if practiced will effectively reduce the current spate of hand injuries and the accompanying morbidity in our environment.

References

Copyright © 2005 African Journal of Paediatric Surgery
Published by Child Health Ventures