How common Acute Traumatic Hand Injuries are?

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Introduction

- Hand injuries are common among casualty surgical patients than we expect. It is a heavy burden on the national economy as well as to the individual family
With the evolution of humans, upper limbs were freed from ground and acquired certain properties, which enabled humans to perform gross and fine movements.

This need precise anatomical & physiological properties.
During acute trauma to hand, these properties are breached in various manners. Thus the management mainly depends on the aetiology of the injury and pattern of distribution. Therefore, acquiring data on prevalence and pattern of distribution of hand injuries in a certain geographical area is important.
Case crossover study on work related hand injuries was carried out in China by Zhevig W, Yi C. et al at Department of Hand Surgery, Jishuitan Hospital, Beigin, China in 2011 and found to have hand injuries in day to day life were common, with its own characteristics.
The purpose of this study was to determine the pattern of distribution of the hand injuries and to identify common causes for those, with respect to local environmental characteristics.
Methodology

- **General objective:**
  To describe the mode of injuries and Pattern of distribution of acute traumatic hand injuries in a series of patients admitted and warranted for surgical intervention.
- **Specific objectives:**

  [1] To describe the victim related characteristics in terms of, age, sex, and hand preference.

  [2] To describe the mode of injury; such as occupational, accidental or assault.

  [3] To describe the pattern of distribution in terms of, involvement of types of tissues, location, Zonal distribution and other associated injuries.
- **Study design:**
  Retrospective study (Descriptive)- Case series.

- **Data collection techniques:**

  [1] Questionnaire to extract; personal information of the victim, about the incident & injuries he has sustained, from Bed Head Tickets (BHT) and operation notes

  [2] Data collection sheet used to layout data according to the questionnaire
Sample:
All patients who were admitted to the PCU and ward 5/6 Unit II (DGH, Negombo)

Duration:
1st of January 2012 to 30th of June 2012
RESULTS

- There were 223 patients admitted

- Six subjects were excluded from the study, since documents were inadequate to extract information.
- Remaining 217 patients consisted of 135 males & 82 females.

- Age ranged from 10 to 60 years.
- 106 patients were in 26 to 40 age group.
- Mean age was 32.5; for males it was 31.46 & females it was 34.14.
184 patients had unilateral hand injuries.
105 males & 79 females.

75(71.4%) males, had their preferred hand involved, while 46(58.2%) females had injuries to their preferred hand.
### Common causes for hand injuries as follows.

<table>
<thead>
<tr>
<th>Category</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>House hold accidents</td>
<td>24, 17.7%</td>
<td>34, 45.1%</td>
</tr>
<tr>
<td>Assault/violent</td>
<td>39, 28.8%</td>
<td>6, 7.3%</td>
</tr>
<tr>
<td>Self inflicted</td>
<td>09, 6.6%</td>
<td>09, 10.9%</td>
</tr>
<tr>
<td>Occupational machinery cut or crush</td>
<td>24, 17.7%</td>
<td>06, 7.3%</td>
</tr>
<tr>
<td>Occupational pricks</td>
<td>03, 2.2%</td>
<td>18, 21.9%</td>
</tr>
<tr>
<td>RTA</td>
<td>33, 24.4%</td>
<td>06, 7.3%</td>
</tr>
<tr>
<td>Others</td>
<td>03, 2.2%</td>
<td>00</td>
</tr>
<tr>
<td>Total</td>
<td>135</td>
<td>82</td>
</tr>
</tbody>
</table>
In 54 males & 40 females, only flexor surface involved while, only extensor surface involvement was 36 in each gender.
Only fingers involved in 54 males 58 females, while only palm or it’s dorsal aspect affected in 48 males & 21 females.

Only soft tissues affected in 40(47%) incidences among females & 24 males. In 66(44%) incidences of tendon damages recorded in males.

(15 males & 3 females had both bone fractures & tendon damages.)
- 66 male & 36 female patients underwent tendon repair.
- Nineteen males & 18 females got zone II involvement among patients with flexor tendon injuries.
84 males & 73 females had isolated hand injuries.

Others (M:F=51:9) had associated injuries apart from hand trauma or underwent thoracotomy, laparotomy, or craniotomy as a therapeutic or diagnostic measures.
These associated injuries were as follows

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A)</strong> Lacerations without neurovascular or tendon injuries</td>
<td>19</td>
<td>7</td>
</tr>
<tr>
<td><strong>B)</strong> Lacerations with neurovascular or tendon injuries</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td><strong>C)</strong> Lower limb injuries lead to A/K or B/K amputation</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td><strong>D)</strong> Injuries lead to therapeutic or diagnostic thoracotomy, laparotomy, or craniotomy</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td><strong>E)</strong> Both C &amp; D</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>
Discussion

- study group consisted of a greater number of males
- feature of other studies in different countries, too
- East African Medical Journal 2008 March contained a research paper headed “To assess the cause & distribution of hand injuries in patients with unilateral acute hand injuries”, which also revealed that males are affected commonly [7].
Hand injuries were more common among people of the age group 26 to 40.
productive and active period of life
should be properly managed to minimize Psycho-
socioeconomic repercussions on the family, as well as the country
this age group tend to take risks in their day-to-day activities
more prone to get involved in violent acts
faces occupational hazards most
These facts readily explain the peak incidence of hand injuries among them
- RTA & violent acts or assaults were the major causes that lead to bilateral hand injuries.
- These are high velocity and heavy forced injuries, hence multiple injuries are quite frequent.
- Preferred hand is affected more in unilateral hand injuries, irrespective of gender.
Males were prone to get hand injuries due to assaults or violent acts & RTA while females were due to household accidental injuries & occupational pricks. This is due to environmental exposure & behavioral pattern of females & males respectively.
If we consider occupational hand injuries, majority of males suffered from lacerations or crush-injuries while females were associated with prick injuries. They could be predestined to suffer this type of hand injuries, according to their job description. Further, lack of safety precautions & inadequate attention may be contributory factors. Reduction in the risk of lacerations & puncture injuries to hand when appropriate gloves are worn [2] (Gary S. Sorok et al.)
American Academy of Orthopaedic Surgeons (AAOS) revealed proximal interphalangeal (PIP) and metacarpophalangeal (MCP) joints are commonly affected sites in athletes with hand injuries [3].

Finger injuries outnumbered palm injuries both in males & females, in females it was by even a wider margin.

Reflex withdrawal from injurious site is common for both genders. Thus most distally placed structures are affected more, & in this situation it is finger
Flexor & extensor surfaces were more or less equally affected, with slight preponderance of flexor surface injuries, irrespective of gender.

Most of the males had tendon injuries, while in females soft tissue injuries were common.

Isolated soft tissue injuries in females is an indication of lightness of the force & nature of the aetiology, they are commonly encountered.
Zone II is the commonest site for flexor tendon damage in both genders.

“no man’s land”

demands skill & experience to deal with those.
- Associated extra hand injuries were uncommon among females.
- Males sustained more lacerations & neurovascular damage.
- 38% of victims (males) had associated injuries away from the hand.
- Because males are commonly involved in violent acts & RTA in comparison to females.
Conclusions

- Males are commonly affected
- Majority of victims were in age group of 26-40 years, which is the productive period of life
- In unilateral hand injuries preferred hand involved more, irrespective of gender
- RTA & assaults or violent acts are common aetiologies for hand injuries among males, while in females’ household accidents & occupational pricks contribute more.
- Fingers mostly affected irrespective of gender.
- Tendon injuries are common manifestation & flexor zone II is the most affected site.
- Males are vulnerable to get associated injuries.
References

1. Surgical international volume 24:12 page 441-445 (orthopaedics)
3. Journal of the American academy of orthopaedic surgeons November/December 2001 vol. 9 no. 6 389-400 (J. Morgan; et al AAOS)
5. Ceylon Medical Journal (CMJ) volume 38 1995
Thank you!