

Assault and facial soft tissue injuries

J. P. SHEPHERD, M. Y. AL-KOTANY, C. SUBADAN and C. SCULLY

University Department of Oral Medicine and Oral Surgery, Bristol Dental School and Hospital, Bristol

Summary—A hypothesis that facial wounds are the most common soft tissue injuries resulting from assault has been tested by examining the records of 225 consecutive victims of assault (169 males, median age 22 years; 56 females, median age 24 years) attending the Accident and Emergency Department of the Bristol Royal Infirmary during 1984/85. Demographic factors including age and sex of patients and time, day and month of attendance were recorded.

Results supported the hypothesis but significantly more men (72%) than women (57%) had facial injuries ($\chi^2 = 12.2$, $p = < 0.01$). Chest, abdominal and limb injuries were proportionately more frequent in women ($p = < 0.001$). Middle third wounds were the commonest facial injuries (affecting 59% of patients) followed by upper third (25%) and lower third (16%). Left-sided facial injury was more common than right-sided ($\chi^2 = 14.6$; $p = < 0.01$). Young adult males most commonly attended, but very few elderly patients. "Risk" of assault appeared highest at weekends, between 10 pm and 2 am and between July and October. The involvement of plastic and oral surgeons in the treatment of assault victims is likely to be considerable.

The British Crime Survey (1983) and Police Crime Statistics (1960-1985) both demonstrate increased incidence of assault and other "violence against the person" over recent years in Britain, and assault has now become the most common cause of fractures of the facial skeleton in most Western industrialised countries (Van Hoof *et al.*, 1977; Haidar, 1978; Lamberg, 1978; Katz *et al.*, 1979; Brook and Wood, 1983; Voss, 1983; Andersson *et al.*, 1984; Hill *et al.*, 1984).

It has been suggested that the patterns of injury resulting from interpersonal violence vary according to prevailing cultural, social and traditional factors as well as industrialisation, unemployment and urbanisation (Ford and Rushforth, 1983; Shepherd *et al.*, 1986). Alcohol is an important predisposing factor (McDade *et al.*, 1982).

In view of this high prevalence of facial bone fractures in assault victims, it seems likely that soft tissue injuries are also common and that plastic surgeons are responsible for the management of a substantial number of cases, either primarily or later for revision of scars. There appear to be no published studies to confirm or refute this, however, and we therefore carried out a retrospective study of a series of victims in a city centre hospital.

Patients and Methods

Records of assault victims attending the Accident

and Emergency Department of the Bristol Royal Infirmary from March 1984 to March 1985 were scrutinised. Two hundred and twenty-five out of 358 victims had soft tissue injuries only, and these victims only were included in the study. Patient's age, sex and time, day and month of attendance were recorded, along with anatomical site of injury which was categorised as facial, other head and neck, chest, abdominal, back, upper limb and lower limb. The face was divided into nine zones: left, central and right, and lower, middle and upper thirds (see Fig. 8 for zone delineation). Nasal injuries resulting in peri-orbital haematomas were categorised as central middle third injuries, and peri-orbital haematomas as lateral middle third. The Chi-squared and Kalmogorov-Smirnov (Seigel, 1956) statistical tests were applied to test for differences between pattern of injury among males and females.

Results

Of 225 patients, 169 were male and 56 female, a ratio of approximately three to one. Figure 1 demonstrates the age and sex distribution: 77% of patients were aged 16 to 35 years, and 59% of males and 55% of females were aged 16 to 25 years. The frequency of attendance of victims by month is set out in Figure 2. Males mostly attended in the months of August, September and October (41%).

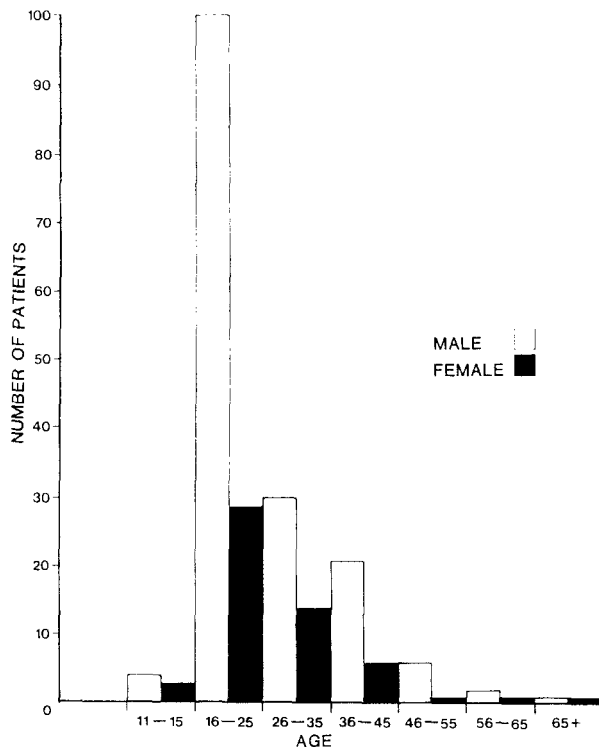


Fig. 1

Figure 1—Distribution of patients by age and sex.

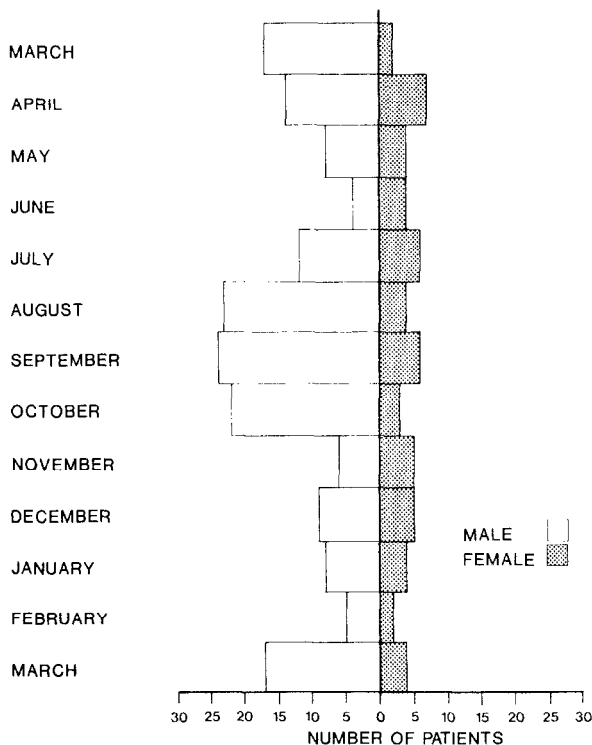


Fig. 2

Figure 2—Attendance of patients by month.

Attendance of women was more evenly spread. The variation in frequency of attendance by day of the week is shown in Figure 3. Male victims attended most frequently between Thursday and Saturday (58%) and attended least often on Wednesdays. Female victims attended most frequently on Saturdays (48%). In the sample as a whole, most victims attended on Saturdays (22%). The variation in time of attendance by hour of the day is set out in Figure 4. Male victims mostly attended between 10 pm and 2 am (57%). The highest level of male attendance was between 1 and 2 am and the lowest between 6 and 9 am. Female attendance was more uniform, although 36% attended in the three periods between 4 and 5 pm, 7 and 8 pm, and 11 and 12 pm. Combining "risk factors" (male victims only) for time, day and month (*i.e.* August–October, Thursday–Saturday, 10 pm–2 am), the excess risk was such that injury through assault was five-and-a-half times more likely during these times.

Anatomical site of injury is shown in Figure 5: 72% of males had facial injuries (involving the face alone in 51%, and the face and other sites in 21%).

In contrast, 57% of women had facial injuries (involving the face alone in 36% and the face and other sites in 21%). There was a significant excess of facial injuries among males compared to females when these injuries were separated from other injuries (Fig. 6: $\chi^2=12.1$, $p<0.01$). When the distribution of all injuries (not just facial) was examined, females demonstrated relatively more thoracic, abdominal and limb injuries than men (Kalmogorov-Smirnov two sample test; $p>0.001$). Overall, the least common site of injury was the abdomen.

Figure 7 demonstrates the distribution of facial injuries according to level. Fifty-nine per cent were middle third compared to only 25% upper third and 16% lower third. Left-sided facial wounds (45% of injuries) exceeded right-sided (30% of injuries, $\chi^2=14.6$ $p=<0.01$, Fig. 8); 35% of injuries were central. Facial injuries were further subdivided according to side (left, right and centre; Fig. 8). Left-sided middle third injuries were most common (30%), followed by right-sided middle third injury (19%). Left-sided injury also exceeded right-sided

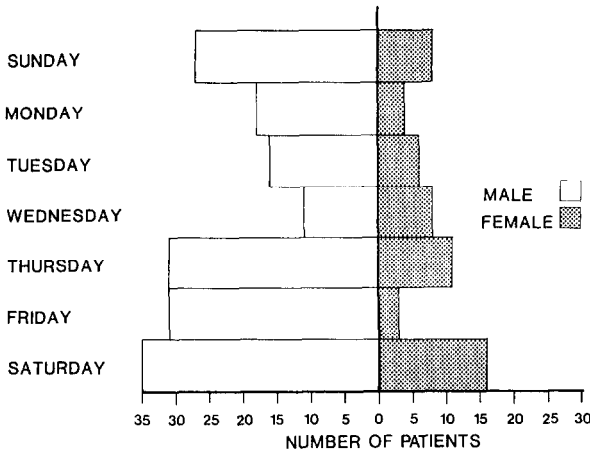


Fig. 3

Figure 3—Attendance of patients by day of week.

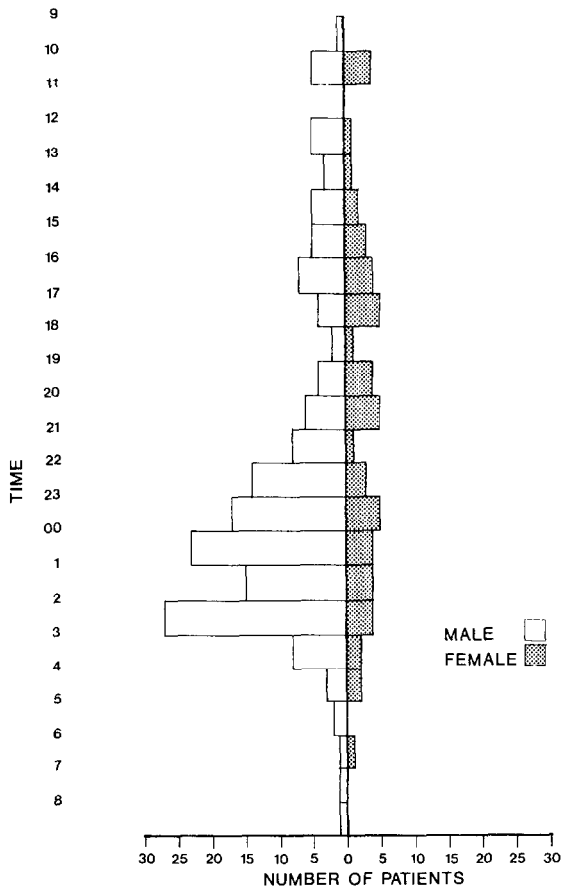


Fig. 4

Figure 4—Attendance of patients by hour of day.

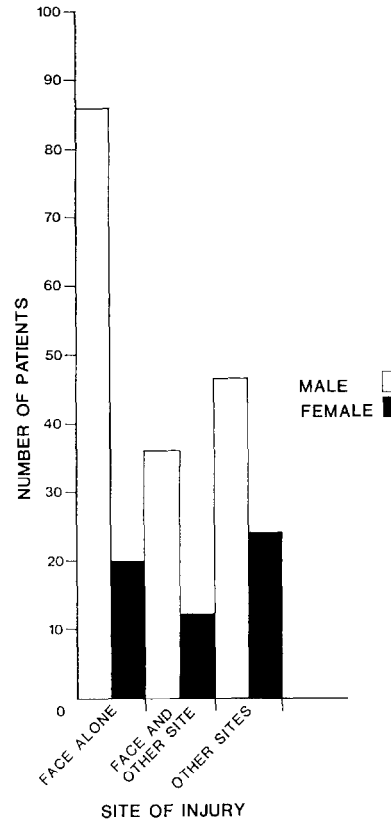


Fig. 5

in the upper third, but lower third injuries were almost equally distributed.

Discussion

Demography

In common with studies of fractures of the facial skeleton in assault victims, males were seen more frequently than females and were 16 to 35 years of age (Maclennan 1977; Voss 1983; Andersson *et al.*, 1984; Hill *et al.*, 1984). Crime surveys (Smith, 1982; British Crime Survey, 1983) also indicate that young adult males are the most frequent victims. The presence of a separate Casualty Department for children may explain the absence of victims under 10 years seen in this study. The lack of elderly patients was also striking, particularly in view of the popular concept that those in this age group are frequently targets of violent attack. The British Crime Survey (1983), however, also reported little violence directed against the elderly.

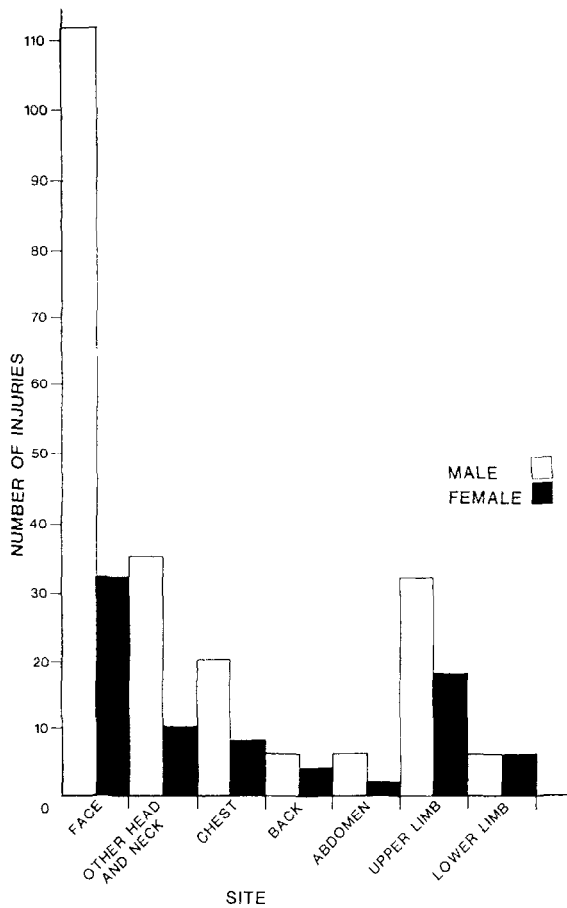


Fig. 6

Figure 6—Anatomical site of injury.

Time, day and month of assault

Time of hospital attendance is likely to reflect time of assault, particularly where bleeding lacerations are concerned. Licensing hours of public houses in Bristol extend until 10.30 pm from Monday to Thursday, and until 11 pm on Fridays, and clearly alcohol intake and a common closing time results in more assault at these times. In contrast, the results of a Swedish study concerned with a country with fewer licensing restrictions (Anderson *et al.*, 1984) indicate more assault earlier in the evening, between 8 and 10 pm. In the present study, assault was also frequent between midnight and 2 am, which may relate to the licensing hours of clubs, which extend later.

More assault at the weekend and in the summer months may relate to increased alcohol consump-

tion and more spare-time city-centre activity (Smith, 1985). The increased attendance of victims in August, September and October compared to May and June may reflect preferred holiday periods, influx of tourists to Bristol or improved weather.

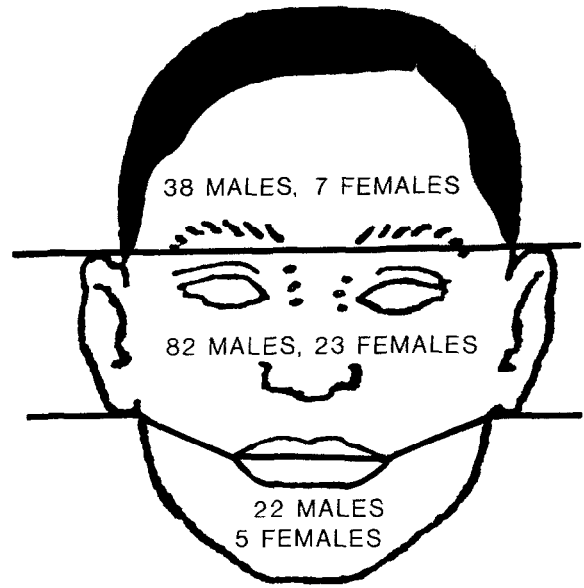


Fig. 7

Figure 7—Numbers of patients with facial injuries (by sex and level).

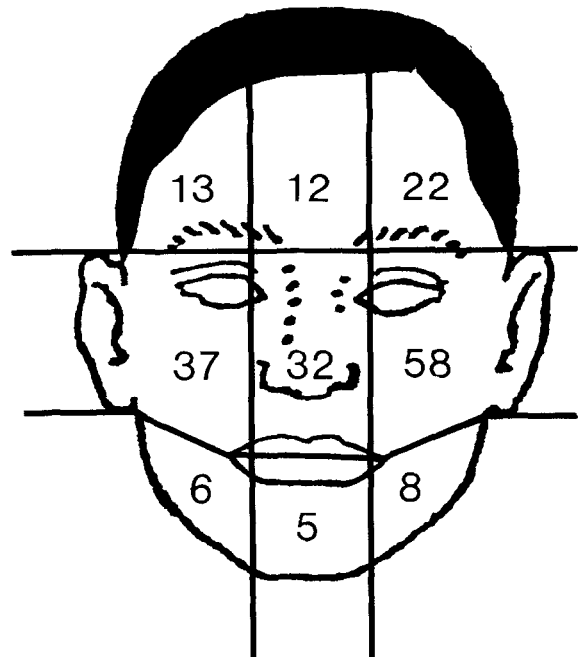


Fig. 8

Figure 8—Distribution of facial injuries by side and level.

Important wine and beer festivals also take place in the summer months, which attract large numbers to the city centre. The number of patients attending on Thursdays was surprising, but may relate to this being pay day for many workers.

Peak hours for assault on women were in the early evening, and between 11 pm and midnight. Although hospital records very rarely contained information on identity of assailants or precise place of assault (unfortunate omissions medico-legally), it seems likely that assailants were mostly husbands or other partners (Gayford, 1975) recently returned home from work or public houses.

Pattern of injury

The face was by far the most common site of injury in this study, supporting the study hypothesis. Explanations include preference (conscious or subconscious) of assailant for this "target" area, and convenience (accessibility of the face as a "target"). There was a significant difference between patterns of injury in males and females, facial wounds being more common in men. It may be the case that male assailants avoid striking the female face so that injuries will not be apparent to onlookers later, or for some other psychological reason. The upper limb was the second most injured site and this might reflect a tendency on the part of the victims to defend themselves by using their arms or simply that victims struck assailants and injured their hands in so doing. If this is the explanation, then the clear distinction between "victim" and "assailant" may be difficult.

The left zygomatic region was the most commonly damaged facial area. This probably reflects the fact that 90–95% of the population are right-handed (Dejong, 1958) and also that hemispheric cerebral dominance leads the victim to turn to the right in a reflex manner to avoid a blow, further presenting the left side of the face to an assailant (Grinkler and Saks, 1966). This pattern is similar to that reported in some studies of facial fractures where assault was a common cause of injury (Hitchin and Shuker, 1973; Maclennan, 1977; Brook and Wood, 1983). In contrast, however, many such studies report more lower third injury than at higher levels (Andersson *et al.*, 1984; Hill *et al.*, 1984). It may be the case that more powerful blows with blunt weapons (such as fists) are directed towards the lower jaw causing fracture, or that attacks with sharp weapons are mostly directed towards the middle and upper thirds, causing only soft tissue injury.

The preponderance of facial injury in this study makes it very likely that many patients will be referred to plastic surgeons who, with Accident and Emergency staff, should understand the likely background of assault and be able to co-ordinate the management of wider social or psychiatric problems.

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C. Subadan, MSc, House Officer

C. Scully, PhD, MRCPATH, FDS, RCS, Professor of Oral Medicine and Oral Surgery

University Department of Oral Medicine and Oral Surgery,
Bristol Dental School and Hospital, Lower Maudlin Street,
Bristol BS1 2LY.

The Authors

Jonathan P. Shepherd, MSc, FDS, RCS, Consultant Senior Lecturer in Oral and Maxillofacial Surgery.

M. Y. Al-Kotany, MSc, MSc Student in Oral Surgery

Requests for reprints to Mr J. P. Shepherd.

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