ABSTRACT

Objectives: We sought to catalog the type, mechanism, and frequency of surfing injuries. Methods: We analyzed consecutive responses to an interactive, Internet-based survey (www.surfstudy.sitehosting.net) obtained from surfers world-wide from 5/98 to 12/98. Incomplete and illogical responses were excluded. The survey included questions about surfer demographics, injury date, type, anatomic location, mechanism, and severity.

Results: 451 surfers from 24 countries responded to the survey, and 25 (6%) were excluded. 426 individuals reported 458 acute injuries and 178 chronic injuries. Laceration (40%) was the most common acute injury followed by contusion (12%), sprain (11%), and fracture (6%). 37% of acute injuries involved the lower extremities, 35% the head and neck, 16% the trunk, and 12% the upper extremities. 55% of acute injuries resulted from contact with the surfer’s own board, 11% from another surfer’s board, and 18% from the ocean floor. Fins (40%) were the most common cause of injury from the surfer’s own board while the nose (48%) was the most common cause from another’s board. Recoil of the surfboard on its leash occurred with 13% of all acute injuries. Shoulder strains (16%) were the most common chronic
Conclusions: Laceration is the most common type of acute surfing injury. 66% of acute surfing injuries result from contact with a surfboard, particularly the sharp fins and nose. Although subject to selection and recall biases, this injury surveillance system may encourage improvements in equipment design and lead to recommendations for use of protective gear.

INTRODUCTION

Surfing is an ancient sport believed to have originated in Polynesia or Micronesia. Currently there are more than 1.7 million surfers in the United States and over 18 million surfers world-wide. The popularity of surfing is growing rapidly, especially among women and internationally, and surfing-related injuries have become more commonplace as more surfers take to the waves.

Studies aimed at determining the type and cause of surfing-related injuries are sparse, and most are limited to small sets of surfers in a particular geographic location. Hartung et al., for example, studied 74 injured surfers who presented to emergency departments in Oahu, HI while Lowdon et al. surveyed 346 members of the Australian Surfriders Association. Each of these studies found that laceration is the most common surfing-related injury and that most injuries involve the head and neck.

We sought to catalog the types, mechanisms, and relative frequencies of surfing-related injuries among surfers world-wide using an interactive, Internet-based survey. We hoped to identify the most common injuries and injury mechanisms in order to identify associated risk factors, to encourage improvements in equipment design, and to recommend use of protective gear.

METHODS

We conducted an observational, retrospective study of acute and chronic surfing-related injuries. We analyzed consecutive responses to an interactive, Internet-based survey (located on the world-wide web at www.surfstudy.sitehosting.net) obtained from surfers world-wide during the period May, 1998 through December, 1998. Incomplete and illogical responses were excluded. We advertised the survey in surfing-related periodicals and on Internet websites to maximize responses from bona fide surfers.

The survey included questions about surfer demographics (age, gender, country of origin, surfing ability, surfing frequency, and use of protective equipment); surfing conditions at the time of injury (type of...
surfboard, type of surf break, wave height, and crowd conditions); and injury specifics (date, type, anatomic location, mechanism, and severity). It also contained an open text section in which respondents could describe their injuries in more detail.

Information obtained from the survey website was downloaded automatically into a Microsoft Access database, and data analysis was performed with Stata 5.0 statistical software.

RESULTS

451 individuals from 24 countries responded to the survey, and 25 respondents (6%) were excluded. 426 surfers reported a total of 458 acute surfing injuries and 178 chronic surfing injuries.

The mean age of respondents was 30, and 91% were male (Fig. 1). 46% of respondents were advanced surfers, 32% intermediate, 11% expert, 9% novice, and 2% professional. Although many surfers reported use of noseguards (47%) and booties (62%), few reported use of helmets (9%), earplugs (15%), or soft-edged fins (4%).

Laceration (40%) was the most common acute surfing injury followed by contusion (12%), sprain (11%), and fracture (6%) (Table 1). 37% of acute injuries involved the lower extremities, 35% the head and neck, 16% the trunk, and 12% the upper extremities. 55% of acute injuries resulted from contact with the surfer's own board, 11% from contact with another surfer's board, and 18% from contact with the ocean floor (Fig. 2). Marine organisms were associated with 3% of acute injuries; only one shark attack was reported. Surfboard fins (40%) were the most common cause of injury from contact with the surfer's own board while the surfboard nose (48%) was the most common cause of injury from contact with another surfer's board (Fig. 3). Most acute injuries (62%) occurred while surfing a wave (Fig. 4). Fewer injuries occurred during recovery of the surfboard (9%), paddling (7%), entering or exiting the water (6%), and duck diving beneath a wave (6%). Recoil of the surfboard on its leash occurred in 13% of all acute injuries.

Musculoskeletal strains (59%) were the most common chronic surfing injury followed by environmental exposure (18%) and infection (15%) (Fig. 5). Among musculoskeletal strains, the shoulder (27%) was the most common joint affected. Ear exostosis (72%) was the most common environmental exposure while otitis (67%) and sinusitis (27%) were the most common infections reported.

33% of surfers kept surfing immediately after suffering an acute injury, 51% sought medical attention, and 8% were hospitalized. 38% of surfers missed more than one day of work or school as a result of acute injury. 45% of surfers sought medical attention for chronic injury, 2% were hospitalized, and 34% missed more than one day of work or
CONCLUSIONS

1. Laceration is the most common acute surfing injury, and most acute surfing injuries involve the lower extremities or the head/neck.

2. Most acute surfing injuries result from contact with a surfboard - particularly the sharp fins and nose.

3. Although surfers spend more time entering/exiting the water, paddling, and sitting/lying on the surfboard while waiting for another wave, most acute surfing injuries occur while surfing a wave.

4. Musculoskeletal sprain/strain is the most common type of chronic surfing injury, and the shoulder is the most common affected joint.

5. Roughly half of surfers did not seek medical attention for their injuries. Although few were hospitalized as a result of injury, more than a third missed greater than one day of work or school.

LIMITATIONS AND FUTURE DIRECTIONS

While this retrospective survey is useful for describing proportions of various injuries and injury locations, it has no ability to describe the sequence of events leading to injury; it cannot identify a direct cause-and-effect relationship between different variables (e.g. experience, maneuver, wave height) and specific injuries. It is also subject to both selection bias (English-speaking surfers with access to the Internet) and recall bias (respondents described events and conditions related to injuries incurred in years as early as 1960).

Despite these limitations, this interactive, Internet-based survey simplifies data collection and data processing and provides easy access to a large number of individuals world-wide. Moreover, it may help identify various risk factors associated with surfing injuries, encourage improvements in equipment design, and lead to recommendations for use of protective gear.

REFERENCES

Distribution of Board Related Injury

N = 310

Rider's Board
- 22 Nose 20
- 18 Other 1
- 27 Part 0
- Unknown
- 68 Rail 2
- 3 Leash 0
- 103 Fin 18
- 15 Tail 1

257 Total 53