Sports Injuries in the Services 1969-1980

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SUMMARY: This paper reviews sports injuries in the Armed Services 1969-1980 to establish their incidence and to analyse trends over time. There were on average 2135 sports injuries per year showing a falling trend over time until 1979 and then rising. Playing soccer was the cause of 43% of the sports injuries over the years 1969-1980. By far the greatest proportion 85% the injuries occurred in the under 30 age group.

The number of medical discharges fell until 1974 when it rose to a new level of between 22 and 31 per year. The number of deaths showed no particular trend over time but half of the deaths were caused by drowning.

Introduction

Injuries due to sport comprise on average 3.5% of all cases of sickness and 17-18% of all injuries, which represents a sizeable amount of manpower wastage. A study by Oelman et al into boxing injuries in the Army¹ prompted this more comprehensive paper covering all sports in all three Services.

The aim of this paper is fourfold:

1. To describe the annual incidence of sports injury requiring admission to a medical establishment and deaths due to injury from 1969 to 1980 inclusive.
2. To determine the contribution, in absolute terms, each sport made to hospital admission, including discharges and deaths.
3. To describe the age distribution of sports injuries.
4. To determine the site of injury in order of frequency.

Methods

The medical statistics branch of the Ministry of Defence (Stats(G)4) has a computerised database called TRIMEDS (Tri-Service and Medical Statistics). TRIMEDS contains records and deaths, medical discharges and sickness lasting two days or more for serving personnel. Each record contains the coded information from the MOD form F Med 14.

From these computer-held records were retrieved details of all male serving personnel who had been admitted to a medical establishment (whether hospital, medical reception station or any other medical unit), or who had been medically discharged or had died as a result of a sporting accident between the years 1969-1980 inclusive. Only records of injuries were extracted — the cause of sports-related diseases is not coded.

The extracted records were the major source of information but where further detail was needed permission

was obtained to examine the relevant records held at Stats (G)4, i.e. F Med 29s and their contents.

The manpower figures were obtained from Stats (M)

Results

Time Trends. Table I shows that during the 12 year period studied there were 25,625 sports injuries recorded, giving an average of 2,135 cases per year or 6.5 injuries per 1,000 average strength* per year.

Table I
Sports Injuries and rates per 1,000 strength

Year	No. Cases	Strength (1,000s)	Rate/1,000 Strength
1969	2959	362.0	8.17
1970	2631	354.2	7.43
1971	2484	349.4	7.11
1972	2355	352.1	6.69
1973	2156	342.2	6.30
1974	1992	327.2	6.09
1975	1996	320.0	6.25
1976	1835	318.5	5.76
1977	1812	312.6	5.80
1978	1661	304.5	5.45
1979	1725	300.6	5.74
1980	2019	308.7	6.54
Totals	25625	3952.0	6.48

Figure 1 illustrates the gradual fall in the incidence of sports injuries up to 1978 and then the increase in 1980. More up-to-date material has not been studied to confirm the continuation of the upward trend.

Figure 2 demonstrates that from an initial downward trend of discharges per 1,000 average strength there has been an approximate eight fold increase in discharges due to sports injuries.

If we examine the discharges due to sports injuries as a proportion of all injuries, Table II indicates that since 1973 there is an apparent steady increase in the proportion discharged due to sports injuries

*The strength of the Armed Forces is the average number of people serving

Fig. 1 Rates per 1,000 strength by year — Inpatients.

Fig. 2 Rates per 1,000 strength by year — Medical discharges.

There is no distinct trend in the annual death rate over the period examined as shown in Table III. This is to be expected in view of the small numbers involved.

Sports: Sports injuries were identified using the NATO cause of injury codes².

Table II
Numbers discharged each year due to All injuries and Sports Injuries

Year	All injuries	Sports injuries	% Sports Injuries % All Injuries
1969	..	17	..
1970	..	15	..
1971	..	12	..
1972	..	6	..
1973	272	9	3.3
1974	283	5	1.8
1975	285	22	7.7
1976	262	24	9.2
1977	280	31	11.1
1978	269	27	10.0
1979	199	29	14.6
1980	164	22	13.4

.. Denotes not available

Table III
Death Rate due to Sports and Sport related Injuries

Year	No. Deaths	Rate/1,000 Strength
1969	5	..
1970	4	..
1971	4	..
1972	9	..
1973	4	..
1974	1	..
1975	6	..
1976	0	..
1977	3	..
1978	3	..
1979	3	..
1980	6	..
Total	48	..

Figure 3 illustrates the contribution each sport made in absolute terms to hospital admissions. Soccer, as is to be expected, contributed the greatest percentage of admissions.

Figure 4 confirms the pre-eminence of soccer as a cause of medical discharges. It is worthy of note, however, that PT is responsible for almost one in five of the sports related medical discharges.

In all 48 deaths were recorded as being attributable to sports injuries. Table IV shows the breakdown of deaths by cause/sport.

Age: Figure 5 shows that both injuries and strength peak at the age group 20-24 but the percentage of injuries falls more rapidly than strength for older age groups. This point is further illustrated by Table V which shows the injury rate per 1,000 average strength decreasing with age.

Table VI shows the rate per 1,000 average strength of sports injury discharges by age. There were no discharges amongst the over 50s and the trend is falling.

Seventy seven percent of the deaths occurred before the age of 30 — the greatest number occurring in the age group 20-24. However when we examine the death rates per 1,000 strength (Table VII) we note that the death rates in the 40-44 and 45-49 age groups are almost comparable to that of the younger age group.

Fig. 3 Inpatients — Percentage by Sport.

Fig. 4 Medical discharges — Percentage by Sport.

Fig. 5 Inpatients — Percentage Strength and Injuries by Age.

Table IV
Cause of Death

Cause/Sport	No. of Deaths
Swimming/Diving	
Skiing/Mountaineering	
Boating	
Soccer	
Other	
Total	

Table V
Injury Rate analysed by Age

Age Group	Injuries	Rate/1,000 Strength
15-19	7004	9.96
20-24	9598	8.53
25-29	5217	6.46
30-34	2267	4.39
35-39	1050	2.56
40-44	332	1.56
45-49	114	0.93
50-54	39	0.56
55+	4	0.00

Table VI
Discharged Rate analysed by Age

Age Group	Discharges	Rate/1,000 Strength
15-19	59	0.084
20-24	78	0.069
25-29	45	0.056
30-34	24	0.046
35-39	7	0.017
40-44	4	0.019
45-49	2	0.016
50-54	0	0.000
55+	0	0.000
Total	219	0.055

TABLE VII
Deaths analysed by Age

Age	No. of Deaths	Rate/1,000 Strength
15-19	7	·010
20-24	22	·020
25-29	8	·010
30-34	3	·006
35-39	2	·005
40-44	4	·019
45-49	2	·016
50-54	0	·000
55+	0	·000
Totals	48	·012

Site: The sites of the injuries were determined from the ICD codes³; Table VIII gives the analysis of the frequency of injury.

The vast majority of admissions were caused by lower limb injuries with an average of some 1,200 cases per year. Head injuries are next most common, followed by upper limb and trunk injuries, with comparatively few internal and other injuries occurring. The pie chart in Figure 6 illustrates these proportions.

Of the 219 sports injury discharges nearly 40% were due to leg injuries, 22% due to 'other' injuries and 17.5% to spinal injuries. Head and upper limb injuries accounted

Fig. 6 Inpatients — By site of Injury.

TABLE VIII
Inpatient cases: Sites of Injury for each major sport/activity

Site	Boxing	Boating	PT	Skiing Mountain eering	Rugby	Soccer	Swim Diving	Basket ball	Cricket	Hand ball Squash	Hockey	Tennis Badminton	Track Field	Unarmed Combat	Other	Total	%
Head	16	365	167	53	1281	1170	191	33	148	211	163	44	8	42	195	4087	15.9
Upper Limb	20	74	168	61	983	1533	41	35	57	42	123	12	21	101	220	3491	13.6
Lower Limb	34	33	696	972	2576	7516	129	327	157	402	296	179	137	176	929	14559	56.8
Spine	20	10	252	33	310	361	127	25	38	98	44	50	31	37	209	1645	6.4
Other Trunk	8	14	114	48	346	363	18	18	27	24	31	5	18	31	81	1146	4.5
Internal	1	10	4	9	69	98	5	4	2	2	1	1	1	5	15	227	0.9
Other	11	13	42	37	78	118	64	4	3	15	4	4	11	5	61	470	1.8
Total	110	519	1443	1213	5643	11159	575	446	432	794	662	295	227	397	1710	25625	100.0
%	0.4	2.0	5.6	4.7	22.0	43.5	2.2	1.7	1.7	3.1	2.6	1.2	0.9	1.5	6.7	100.0	

for approximately 10% each with only one case each of internal and 'other trunk' injuries.

The most common cause of death was by drowning. The second most common site of injury causing death was the head, half of which were due to skiing/mountaineering accidents. The proportion due to each site is shown in Figure 7.

Discussion

The database used in the compilation of this paper is restricted to information relating to admission to medical establishment necessitating an overnight stay (including people brought in dead). This necessarily excludes injuries referred to hospital which did not require admission and includes admissions caused by factors other than

Fig. 7 Deaths by site.

the severity of the injuries. It also excludes the very large number of injuries treated by the GP and in outpatient departments which represent a very large loss of manpower.

Men only, officers and other ranks, were studied, as the women would exhibit entirely different trends and, therefore, need to be studied separately. The small number of women involved would also have inhibited a meaningful comparison.

Time Trends: The most interesting point to note is the falling trend in the number and rate of sports injuries until 1979 and then the rise in 1980. The falling trend could be due to a number of factors, such as better standards of fitness, more training and supervision. However, the rise is more difficult to explain.

The rate of medical discharges changes from a falling trend to a rising one about 1974. This is particularly curious since the number of all medical discharges fell quite considerably during this time. Part of the change, apparently, could be caused by coding changes in respect of 'Late Effects'. The small number of deaths prevents detailed analysis of time trends.

Sport: Most inpatient admissions from sports injuries occur in soccer but this was also the most widely played sport in the Army (and one would presume the other Services) in 1962 according to Rosenbaum⁴, so soccer is not necessarily the most dangerous. Using Rosenbaum as a guide of how much sport is played it was found that rugby is the most dangerous sport, producing one injury in alternate playing periods. However, Rosenbaum's data was collected in 1962 and playing trends may well have changed over the years, which would affect results.

It is worth noting at this point that half of the deaths were caused by drowning, either swimming/diving or boating, so perhaps this is indicative of a need for swimming instruction.

Age: It would appear that younger men are injured more often than older men although the numbers actually playing sport probably affects the proportions. Older men tend not to get so involved in the more dangerous sports, and in sport in general, so they would be less at risk. Also older men tend to be more skilful and so less prone to accidents.

Site: A topical area of study is that of spinal injuries, particularly those caused by playing rugby or doing gymnastics. J R Silver has already studied rugby injuries in the civilian population⁵ so the records of the 14 men who were medically discharged as a result of spinal injury caused by PT were extracted (there were no deaths). Excepted for one unknown case, all of the accidents occurred while the man was on duty, and five of the men were involved in display teams which would imply a high level of competence. Of the 14, 10 were at least partly paralysed or had limited movement, the others had recurrent backache. The presence of the five display team members shows that it is not only the inexperienced men who suffer these injuries.

A useful follow up to this study would be a survey, similar to Rosenbaum's, into how much sport is played in each Service. The Services could be studied separately to enable comparison and perhaps the Women's Services could be studied too.

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