REVIEWS

Antipersonnel mines: who are the victims?

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Abstract

The International Committee of the Red Cross (ICRC) has surgically treated 49 946 war wounded from all sides of the Afghan conflict. Two hospitals were established in Peshawar (1981) and Quetta (1983) on the Afghan border of Pakistan and inside Afghanistan in Kabul (1988). One quarter of all war wounded were injured as a result of antipersonnel mines. In 1980 a UN weapons convention adopted specific rules on the use of land mines, yet despite this, mines are still present and causing casualties long after the ceasefire. In the ICRC hospital Peshawar, 48% of all war wounded in the last year were injured as a result of mines. Non-combatants accounted for 34%, with the majority being children < 16 years old (25%); 78% of all mine injured people claimed to be returning refugees, of whom 37% had returned within three months. A significant increase in injuries occurred in children, from 14% in 1990 to 25% in 1992. For a country recovering from war, the presence of mines causes a serious environmental, social, and economic burden, and for the victims, continued tragedy not only for their families but also the whole country for many years to come.

(*J Accid Emerg Med* 1996;13:343-346)

Key terms: antipersonnel mines; injuries; Afghanistan

The International Committee of the Red Cross (ICRC) has treated 49 946 war wounded from the conflict in Afghanistan in the last 12 years. These have reached one of three surgical hospitals directly or through Red Cross and Red Crescent first aid posts. The hospitals have been established in Peshawar and Quetta on the Afghan border of Pakistan and in Kabul, the capital of Afghanistan. Approximately, one quarter of the wounded have been injured by antipersonnel mines.

The nature and severity of injuries from antipersonnel mines has only recently been documented,¹ although military medical authors tend to put little emphasis on this subject.² The surgical implications of mine injuries have also been addressed.¹⁻⁵ The number of days spent in hospital, of surgical procedures, and of blood transfusions are all

more for mine injured than for other war wounded, as is the long term disability among survivors.^{1-6,7} Both the medical facilities and the centres for manufacture of prostheses require resource and expertise, which are usually lacking in developing countries or in those recovering from war. The extent to which non-combatant populations are affected by mines has not been established. The hospitals of the ICRC on the Afghan border have provided an opportunity to investigate this.

Following the fall of the communist government of Afghanistan in April 1992 all the ICRC hospitals concerned with this conflict saw an increase in the number of mine injured (fig 1). Many claimed to be returning refugees.

The effects of these weapons and the continued flow of patients resulting from them, despite the end of formal hostilities, have caused great concern to the ICRC Medical Division. An international symposium of experts was organised in April 1993 with the intention of finding a means to limit the human cost of this form of warfare. It soon became obvious that there is little information about who the victims of mine warfare are in modern guerilla conflicts such as that in Afghanistan. This study was undertaken to establish who are the victims of antipersonnel mines in a country recovering from war and to which refugees are returning.

Methods

The total number of mine injured admitted to the ICRC hospital in Peshawar per month was retrieved from the hospital records from the beginning of 1990 to February 1993.

Each patient admitted to the ICRC hospital in Peshawar between the beginning of June 1992 until the end of February 1993 who claimed to have been injured by a mine was interviewed. An Afghan translator employed by the ICRC completed a questionnaire. If the patient was unable to give the information, his accompanying relative was interviewed. The interview was conducted as soon as possible after admission. The age and sex of the patient

Table 1 Questions asked of mine injured patients

Were you a refugee recently returning to Afghanistan? (see text)
Which province or district did you come from?
What were you doing when you were injured?
How long did it take you to get to this hospital?

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Accepted for publication
29 March 1996

Figure 1 Mines: a problem for Afghan refugees. Admissions to ICRC Hospital, Peshawar.

was noted and the questions asked are listed in table 1.

The hospital admission book was used to retrieve the numbers of mine injured and their age, sex, and evacuation time for the same period (June to February) for the two preceding years.

For the purposes of this study, "recently returned" means returning to Afghanistan within the three months before admission. Non-combatants are defined as children of 15 years or less, all women, and men over 50 years of age.

Results

The admissions of mine injured per month are shown in fig 1 and examples of their injuries in figs 2-4. In the study period there were 720 mine injured patients admitted. Questionnaires were incomplete for 109; these either had such superficial injuries that they left hospital before they could be interviewed, or they left against medical advice because of the unacceptableness of surgical amputation,¹ or they died soon after admission because of the severity of injury.

Table 2 shows the age and sex distribution of the patients in the study group and also for the previous years.

A total of 476 had returned to Afghanistan; of these 225 (36.8%) had returned within three months. Table 3 shows where the patients in the study group came from. Table 4 shows what the patients were doing when they were injured by the mine. Table 5 shows the evacuation time to hospital with figures for the two previous years for comparison.

Discussion

The use of antipersonnel mines was developed in World War II; they were placed to prevent the lifting of antitank mines. They are now widely used in modern warfare where there is little control of the combatants and likewise little respect for the international laws relating to the conduct of war.⁸⁻⁹ There are many varieties; some are designed to maim only, while others may kill. Some can be scattered by air or artil-

Table 2 Sex and age distribution of patients, with two previous years for comparison

	June 1990 to Feb 1992		June 1992 to Feb 1993	
	n	%	n	%
Children of 15 years or less	113	14	183	25
Males over 16 and less than 50	642	79	476	66
Women	20	2	43	6
Males over 50 years	34	4	19	3

Table 3 Where the patients came from

	n	%
Ningahar	382	62
Paktia	50	8
Logar	16	3
Laghman	58	9
Kunar	31	5
Kabul	54	9
Other provinces	20	3

Table 4 What the patient was doing when injured

	n	%
Travelling	94	15
Working in the field/fetching water	120	20
Fighting	82	13
Demining	26	4
Playing with mine	46	8
Other	232	38
Not answered	11	2

Table 5 Evacuation time to hospital with two previous years for comparison

	June 1990 to Feb 1992		June 1992 to Feb 1993	
	n	%	n	%
Less than 6 h	41	5	93	13
Less than 24 h	342	42	400	55
More than 24 h and less than 72 h	162	20	77	11
Longer than 72 h	135	17	78	11
Readmissions	129	16	72	10

lery; many are undetectable beneath the ground because of lack of metal components.¹⁰ Medical, demining, and humanitarian agencies who work in countries affected by such wars have voiced their concerns because they have witnessed the long term results of this form of warfare.¹¹⁻¹⁸ Mines do not discriminate between combatants and non-combatants and most lay dormant for years, injuring, maiming, or killing the civilian population long after the ceasefire. Apart from the horrifying individual effects, there are severe implications for the society and its economy, especially in rural, agricultural societies.

While it is obvious from the results that the majority of victims are men within fighting age groups, in the study period, there was an increase in the proportion of women and children (see table 2) compared with the two previous years. This would be expected when a refugee population returns to a mined area and is unfamiliar with mines and their whereabouts. It provides objective information about the danger to civilian populations from indiscriminate use of antipersonnel mines.

Figure 2 Severe injury of the left foot from a buried antipersonnel mine. The patient subsequently had a below-knee amputation.

Figure 3 Traumatic amputation of the left leg (still covered by field dressings) and severe injury of the right leg and foot.

The majority of the patients admitted in the study period came from the province closest to the hospital (Ningrahar). The rest came from nearby provinces. The distances involved explain the long evacuation time; the change in political events with easier road transport

Figure 4 The patient shown in fig 3, two weeks after bilateral above-knee amputation with delayed primary closure of the stumps. A patient with such severe disability will encounter great difficulty reintegrating into a society which is caught in or recovering from armed conflict.

explains the improvement of evacuation time seen in the study period compared with previous years. The information given in table 3 has been passed on to demining agencies and the United Nations High Commission for Refugees and other agencies concerned with repatriation of Afghans. Such knowledge of the location of mines helps to direct the work of demining agencies and mine awareness programmes.

The Medical Division of the ICRC believes that it has treated a small but unknown number of the total mine injured from Afghanistan; however, the proportion of non-combatants is likely to be the same among the remainder. These will have been treated in other hospitals or not at all. Figures for the total dead and disabled are impossible to find but both must reach many tens of thousands. This indicates the scale of the problem.

It is hoped that this paper will increase awareness of the now recognised worldwide epidemic of antipersonnel mine injuries. It underscores the fact that these weapons devastate the civilian population after armed conflict. Resources need to be made available both for medical activities for the victims of mine war fare and for demining.

- 1 Coupland RM, Korver A. Injuries from antipersonnel mines: the experience of the International Committee of the Red Cross. *BMJ* 1991;303:1509-12.
- 2 Bellamy RF. The medical effects of conventional weapons. *World J Surg* 1992;16:888-92.
- 3 Coupland RM. Amputation for antipersonnel mine injuries of the leg: preservation of the tibial stump using a medial gastrocnemius myoplasty. *Ann R Coll Surg Engl* 1989;71: 405-8
- 4 Coupland RM. *Amputation for war wounds*. Geneva: The International Committee of the Red Cross, 1992.
- 5 Coupland RM, Bunting R. *Antipersonnel mine injuries: surgical management*. Geneva: The International Committee of the Red Cross Audio-visual Dept, 1993.
- 6 Eshaya-Chauvin B, Coupland RM. Transfusion for war wounded patients: the experience of the International Committee of the Red Cross. *Br J Anaesth* 1992;68:221-3.
- 7 Coupland RM. Transfusion for war wounded. *Br J Anaesth* 1993;71:172
- 8 The International Committee of the Red Cross. Conference of government experts on the use of certain conventional weapons. Geneva: International Committee of the Red Cross, 1976.
- 9 Sandoz Y. Prohibitions or restrictions on the use of certain conventional weapons. In: *International review of the Red Cross*. Geneva: International Committee of the Red Cross, 1981.
- 10 Foss CF, Gander TJ, eds. *Jane's Military vehicles and logistics*, 13th ed. Coudsdon: Jane's Information group, 1992.

- 11 The International Committee of the Red Cross. *Mines: a perverse use of technology*. Geneva: International Committee of the Red Cross, 1992.
- 12 Russbach R. Casualties of conflicts and mine warfare. In: Cahill KM, ed. *A framework for survival*. New York: Basic Books, and the Council on Foreign Relations 1993:121-37.
- 13 McGrath R, Stover E. Injuries from land mines. *BMJ* 1991; 303:1492.
- 14 McGrath R. Trading in death: antipersonnel mines. *Lancet* 1993;342:628-9.
- 15 Asia Watch and Physicians for Human Rights. *Landmines in Cambodia: the coward's war*. New York: Asia Watch and Physicians for Human Rights, 1991.
- 16 Physicians for Human Rights. *Hidden enemies: land mines in Northern Somalia*. Boston: Physicians for Human Rights, 1992.
- 17 Human Rights Watch. *Land mines in Angola*. New York: Human Rights Watch, 1993.
- 18 Physicians for Human Rights. *Landmines: a deadly legacy*. New York: The Arms Project of Human Rights Watch and Physicians for Human Rights, 1993.

Incidence, pathology, and treatment of adder (*Vipera berus* L.) bites in man

C J Reading

The adder (*Vipera berus*) is the most widely distributed species of viper to occur in Europe. Its range extends north into the arctic circle and south to northwest Spain, northern Italy, and much of the Balkans. The distribution of the adder overlaps with that of at least three other species of viper in Europe, notably the Asp viper (*Vipera aspis*) in western and central Europe, the nose-horned viper (*Vipera ammodytes*) in the Balkans, and Orsini's viper (*Vipera ursinii*) in eastern Europe. Where overlap occurs there is considerable scope for the misidentification of snakes involved in cases of snake bite in man. However, in northern Europe and Scandinavia, the adder is the only venomous native snake and this problem does not arise.

In this review, published data from both the United Kingdom and northern Europe (including Scandinavia) are examined and considered alongside unpublished data obtained for Scotland, from many of the 14 regional health authorities (RHA) covering England and Wales, and from the National Poisons Information Service (NPIS) in London.

The adder or common viper (*V. berus*)

The adder is the only venomous snake to occur naturally in the United Kingdom. It is a relatively small, thick bodied snake typically reaching a length of 65 cm as adults.¹ Although very dark or even melanistic forms do occur, most adders have a clearly defined, dark, zig-zag stripe along the centre of the back. In females the background colour is often brown or reddish brown, whereas in males it is usually much paler (whitish/grey). Adders give birth to "live" young in late summer. At birth they have a length² of 16-17 cm and have fully developed fangs and venom glands. The volume of venom that can be injected by a juvenile when biting is considerably less than the 10-18 mg delivered in a typical bite from an adult.³

Viper venom

The venom is produced by modified salivary glands, stored in venom sacs which lie under and behind the orbit, and is injected 2-3 mm (subcutaneously) into the victim through the

two enlarged, hollow and retractable fangs at the front of the mouth. However, the volume of venom delivered in a bite will vary and may be considerably less than the maximum possible for any individual snake if only one fang penetrates the victim. The venom of *V. berus* is a yellow liquid containing a complex mixture of high molecular weight proteins, mainly proteases, peptide hydrolases, hyaluronidase, and phospholipases whose effects are predominantly cytotoxic and haemorrhagic.^{4,5} The cytotoxic component attacks the vascular endothelial linings, typically resulting in early and extensive oedema and hypovolaemia. Systemic haemorrhage and coagulopathy appear to be rare in man, possibly because of the combination of relatively low venom potency and small delivered dose in a victim of relatively large body mass. Although it has not yet been isolated, there is some evidence that a cardiotoxic component is present in the venom causing T wave inversion, myocardial damage,⁶ and second degree heart block.⁷ Although now rare in the United Kingdom, death from adder envenoming can occur.

Seasonality of adder bites in man

The adder spends the winter months, typically mid-October to the end of February, in hibernation.² However, in the south of the United Kingdom adders may emerge from hibernation as early as January and remain active until November. Adders are, however, usually at their most active during the period May to September but are more readily observed and encountered during the early spring.

Although adder bites in man have been recorded for each month from February to October, most recorded bites (72.6%) occur during June, July, and August with a peak incidence (33.2%) in July in the United Kingdom and Europe.^{4,5,8-15}

Frequency of adder bites in man

Published reports provide information on cases of adder bite only where the victim presented to a general practitioner or hospital for treatment. The information is therefore biased and likely to underestimate the number

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Key terms: adder, bites, envenoming, pathology, treatment

Accepted 8 May 1996