World Health Organization

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Animal bites

12 January 2024

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Key facts

- **Bites by animals carrying venoms, toxins and pathogens are a significant cause of morbidity and mortality worldwide.**
- **Globally, up to 5 million people are bitten by snakes annually, with nearly 50% of them ending up with envenomation – mostly in Africa and South-East Asia – necessitating prompt medical intervention with appropriate antivenom.**
- **Dog bites account for tens of millions of injuries annually; the highest risk is among children.**
- **Rabies is a significant health concern following dog, cat, bat or monkey bites.**

Overview

The health impacts of animal bites vary with the type and health of the animal species, the size and health of the bitten person, and accessibility to appropriate health care. Paediatric cases are of particular concern related to animal bite injuries, with over half of the victims being children.

While numerous animal species have the potential to bite humans, incidents involving domestic animals are significantly more prevalent than those involving wildlife, and subsequent infections from wounds can lead to severe illness or even death. In general, the

key to better outcomes related to animal bites is timely presentation of the bitten person for appropriate medical attention and accurately identifying the animal attacked. Animals of common concern:

- **snakes**
- **dogs**
- **other vertebrates: cats, monkeys, rodents, bats, and other wildlife**
- **invertebrates: insects, spiders, scorpions, jellyfish, sea urchins, and stingrays.**

Snake bites

Scope of the problem

Nearly 5 million people are bitten by snakes worldwide every year, with 94 000–125 000 deaths due to envenomation-related complications, and 400 000 ending up with disabilities.

Who is most at risk?

Most of snake bites occur in Africa and South-East Asia, common among people living in rural, resource-poor settings, mainly agricultural workers, women, and children.

Treatment

Prompt medical attention is the key. Main steps of care include:

- **immediate and complete immobilization of the affected body part and prompt transportation to the closest medical facility;**
- **cleanse wounds to decrease infection risk;**
- **avoid tourniquets and cutting wounds;**
- **treatment with appropriate antivenom suited for snakes endemic to the region;**
- **supportive therapy: airway support; and**
- **administration of tetanus vaccine if the person has not been adequately vaccinated.**

Prevention of snake bites and their serious health consequences

Prevention of snake bites involves informing communities about snake bite risks and prevention techniques including wearing protective shoes/boots; keep storage areas clear of rodents; raise beds above floor level; and tucking mosquito nets securely under sleeping mats.

Healthcare providers should be educated on snake-bite management. Public health authorities and policymakers should ensure appropriate supplies of safe and effective antivenoms to communities.

Dog bites

Scope of the problem

There are no global estimates of dog bite incidence, however studies suggest that dog bites account for tens of millions of injuries annually. In the United States of America for example, approximately 4.5 million people are bitten by dogs every year. Low- and middle-income country data are more fragmented, however some studies reveal that dogs account for 76–94% of animal bite injuries.

Dog bite fatality rates are higher in low- and middle-income countries than in high-income countries because dog-mediated rabies viral infection, and there may be a lack of post-exposure treatment and appropriate access to health care. An estimated 59 000 people die annually from rabies, and bites from rabid dogs account for majority of these deaths. While rabies is vaccine preventable and post-exposure prophylaxis can be administered soon after exposure to save lives, once signs of rabies appear, there is no treatment and the consequences are fatal.

Who is most at risk?

Children are the largest percentage of people bitten by dogs, with the majority in their mid-to-late childhood. The risk of injury to the head and neck is greater in children than in adults, adding to increased severity, necessity for medical treatment and death rates.

In some countries, males have a higher frequency of dog bites than females. Dog bites account for over 50% of animal-related injuries in travellers. Provoked bites are often due to attempts to feed or handle animals, whereas unprovoked bites often are associated with infectious stages of rabies.

Treatment

Treatment depends on the location of the bite, the overall health condition of the bitten person and whether the dog is vaccinated against rabies. It is recommended to confine the dog and observe daily for 10 days under the supervision of a veterinarian, and in coordination with local public health authorities. The main principles of care include:

- **early medical management**
- **irrigation and cleansing of the wound with soap and running water for 15 minutes**
- **primary closure if the wound is low risk for developing infection**
- **prophylactic antibiotics for high-risk wounds or people with immune deficiency**
- **rabies post-exposure treatment depending on the dog vaccination status**
- **administration of tetanus vaccine if the person has not been adequately vaccinated.**

Prevention of dog bites and their serious health consequences

Communities – especially children – should be educated about the risks of dog bites and prevention including avoiding stray dogs and never leaving a child unattended around any dog.

Health-care providers should be educated on the appropriate management of dog bites. Health authorities and policymakers should ensure rabies control within dog populations, ensure appropriate supplies of rabies vaccines and post exposure treatments for potential rabies exposure in people.

Other vertebrate bites: cats, monkeys, bats and rodents

Scope of the problem

Cat bites: Worldwide, cat bites account for 2–50% of injuries related to animal bites, second to dog bites. In Italy, the incidence of cat-related injuries is 18 per 100 000 population; while in the United States cat bites result in 66 000 emergency departments visits yearly. Cat bites are associated with rabies viral infections and several bacterial infections related to bartonella, brucella, leptospira, and campylobacter species. The likelihood of a cat bite becoming infected is double of that of a dog bite.

Monkey bites: Monkey bites account for 2–21% of animal bite injuries. Two studies from India reported monkey bites to be the second common source of bite injuries next to dogs bite injuries. Monkey bites are associated with rabies, simian retroviruses, herpes B virus, and mpox infections, as well as bacterial infections related to salmonella and campylobacter species.

Bat bites: Bats are a reservoir for rabies virus worldwide and their bites might not leave recognizable marks making it challenging to determine the risk of exposure. While there are no worldwide estimates on bat bites, bats are the leading cause of rabies deaths in the

United States. In Latin America, the risk of bites from hematophagous bats poses the risk of rabies for humans.

Rodent and other wildlife bites: Rats, mice, squirrels, chipmunks and ferrets are commonly associated with bite injuries. Rabies is relatively rare in domestic rodents; however, the bite injuries may lead to bacterial infections of leptospira, salmonella species and hantavirus infections.

Bites by raccoons, skunks, and foxes are often associated with rabies exposure in the United States. While injuries to vital organs are to be cautious of, bites by birds are rarely associated with life-threatening infections.

Who is most at risk?

Cat bites: Female adults have the highest rate of cat bites. However, similar to dog bites, cat bites are particularly more serious in children with injuries to the face, neck and head.

Monkey bites: Monkey bites are an important risk among travellers, after dog bites. Occupational and recreational exposures to monkey bites are related to animal control, veterinary, zoologist, wildlife professions, and hunting or trapping animals.

Bat bites: People are often exposed to bat bites because of occupational or recreational activities that involve regular handling of bats such as animal control and wildlife workers, veterinary staff and zoologists. Travellers to rabies-enzootic areas are also at risk of exposure.

Rodent and other wildlife bites: Owning small rodents as pet animals often lead to bite incidents related to feeding and interacting.

Bite injuries by any wildlife to be considered as risky exposures.

Treatment

Treatment depends on the animal species, location and the severity of the bite, epidemiology of rabies in the area, and the rabies vaccination status of animal inflicting the bite. The main principles of care include:

- **early medical management;**
- **wound care by irrigation and cleansing of the wound with soap and running water for 15 minutes;**
- **prophylactic antibiotics to decrease infection risk;**
- **rabies post-exposure treatment depending on the animal vaccination status; and**
- **administration of tetanus vaccine if the person has not been adequately vaccinated.**

Prevention of animal bites and their serious health consequences

Communities and travellers in the rabies enzootic areas should be informed about the risks of animal bites and prevention techniques including vaccinating domestic cats against rabies, avoiding intentional contact with wildlife, and reaching out to animal control or a public health agency for assistance.

Health-care providers, health authorities and policymakers should ensure availability of rabies vaccines and controlling infection within animal populations.

Invertebrate stings and bites: insects, spiders, scorpions, jellyfish, sea urchins and stingrays

Scope of the problem

Stinging or biting insects such as bees, wasps, fire ants, hornets; bites by venomous spiders; as well as scorpion bites can cause a spectrum of health effects ranging from mild discomfort or pain to a potentially lethal reaction in individuals allergic to their venom.

Bites by tropical marine invertebrates such as jellyfish, stingrays and sea urchins can cause mild to life threatening reactions due to envenomation.

Who is most at risk?

Individuals who are allergic to the insect venom or immunodeficient are at high risk.

Marine invertebrate exposures are related to recreational activities including beach walking, swimming and surfing.

Treatment

Treatment depends on the animal species, bite location, clinical symptoms and allergic reaction of the bite victim. The main principles of care include:

- **early medical management;**
- **scorpion bite: wash affected area with soap and water and cold compress when possible;**

- **marine invertebrates: wash the area with seawater and when possible, soak the affected area in hot water (45 °C) for 20 minutes to reduce pain;**
- **monitor for any signs of breathing difficulties, acute allergic reaction or anaphylaxis;**
- **treatment with appropriate antivenom when applicable; and**
- **prophylactic antibiotics to decrease infection risk.**

Prevention of invertebrate bites and their serious health consequences

Communities and travellers in the high-risk areas should be informed about the risks of these invertebrate bites and prevention techniques including avoiding intentional contact, wearing protective clothing during outdoor activities.

Health-care providers should be educated on the appropriate management of these injuries including the variations of clinical symptoms elicited in individuals with potential to develop allergic reactions to the envenomation.

WHO response

WHO is working to address the public health problem of animal bite injuries.

For snake bites: snakebite envenoming fact sheet

For rabies: rabies fact sheet

For all other animal-bite injuries, WHO prioritizes data collection initiatives to estimate the burden and risk factors; advocates the strengthening of emergency response; and promotes research initiatives that focus on effective prevention interventions and populations most affected.

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