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Review Article

Lecture: "First aid to the population for wounds during accidents, catastrophes, natural disasters, and terrorist attacks" for Humanitarian and Technical Universities

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Wounds are called traumatic violation of the integrity of the skin or mucous membranes with possible damage to the deeper tissues.

Classification of wounds

There are the following types:

1. By the depth of damage: surface; deep.
2. By the amount of damage: single; multiple.
3. By type of weapon: firearms; caused by cold steel.
4. According to the mechanism of occurrence: hurt; crushed; chipped; sliced; chopped.
5. As the edges of the wound defect: linear; patchwork; torn; scalped.
6. In relation to the cavities of the body (skull, chest, abdomen, joints): penetrating; non-penetrating.
7. By the form of the wound channel: through; the blind; tangents.
8. By infectiousness: operating or aseptic; micro contaminated.
9. By volume - with or without damage: large vessels; nerves; bones; adjacent organs.
10. Specific: bitten; poisoned (including chemical warfare agents and substances that occur when exposed to atomic and thermonuclear weapons) [1-3].

Signs of wounds are:

1) Pain

2) Edema

3) Bleeding

4) The gaping (divergence) edges

5) Violation of the function of the body [4].

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They can be divided into absolute (characteristic only for wounds) and relative (occurring in other types of injuries, such as bruises, dislocations, fractures).

The absolute sign of wound is only one - a gaping or diverging edges. The remaining signs are considered relative, as they can be in other types of damage. It should be emphasized that based on this definition of a wound, a gaping or diverging edges of the skin should occur after traumatic injury. If a defect in the skin or mucous membranes results from a prolonged static load (complete break of the spinal cord during fracture of the cervical spine, leading to immobility and, as a result, bedsores on the back of the head, in the area of the shoulder blades, sacrum and heels, where the skin is directly crush the bones) or diseases (ulcers of the mucous membranes of the stomach and duodenum with relevant diseases of the gastrointestinal tract or trophic ulcers in the ankles during varicose disease), then it is not oh.

The pain depends on the location of the wound and the functional state of the victim's nervous system. The most painful wounds are accompanied by damage to the nerve trunks or areas with abundant peripheral nerves (abdominal cavity, periosteum). What matters are the sharpness of the hurting weapon, the speed of the wound and the nature of the damage? A wound caused by a cutting object (incised wound), other things being equal, is accompanied by less pain than a torn or crush.

Increased pain in the wound usually indicates the occurrence of an infectious complication, in particular the development of an anaerobic process. Pain significantly affects the condition and progress of recovery of the victim, so the fight against pain should be carried out at all stages of treatment.

Bleeding is a permanent symptom, but its severity may be different. Hardest cut wounds bleed. Bleeding is less pronounced in case of lacerated, bruised or crushed wounds, since in these cases, the damaged ends of the vessels are crushed, crushed, and the thrombus formation process proceeds quickly. The duration and intensity of bleeding from small vessels depends on its caliber. Spontaneous hemostasis occurs after 7-15 minutes. Bleeding from the wound, which lasts 15-20 minutes, indicates damage to a larger vessel or impaired coagulation of the blood.

Depending on the intensity of bleeding, the phenomena of acute blood loss may develop.

Distinguish primary bleeding, occurring at the time of injury, early secondary bleeding, occurring in the first hours or days after injury, if the thrombosis of damaged vessels was fragile, or stop the bleeding in the wound when it was processed was imperfect. There are also later secondary bleeding, resulting from the melting of a blood clot or the destruction of the degree of the vessel during the development of a wound infection.

The gaping (divergence of the edges) of the wound depends on the nature of the damage to the elastic fibers of damaged tissues, the location and depth of the wound. The location of the wound across the elastic fibers leads to a larger gaping. Significant is the gaping of crossed muscle or transversely crossed Apo neurosis. Depending on the expected clinical course of the wound process, it is necessary either to eliminate the gaping wound, or to maintain or even artificially increase it [5-7].

Factors affecting the course of the wound process:

1) Location

2) Character

3) The severity of the injury

4) Massive infection

5) Type of microflora

6) The state of immunobiological reactivity of the organism [8].

Phases of the wound process: Wound healing is a complex biological process that occurs in a wound, which is closely related to the general reaction of the body and proceeds cyclically depending on the morphological and functional changes in the wound and surrounding tissues. It can be divided into three periods or phases.

The first phase-hydration (edema): occurs immediately after injury and lasts for several days. The developing reflex vasospasm in the wound area is replaced by their sharp expansion (paresis), which leads to impaired blood circulation in the tissues and lymphostasis. Tissue swelling has a positive effect on the course of the wound process, however, excessive swelling in the case of a serious injury, in case of cardiac or renal pathology adversely affects the development of the first phase. During treatment in this phase, conditions should be created for outflow of wound contents (wound dissection, drainage, and the use of hypertonic solutions).

The second phase is dehydration (reduction of edema): It is characterized by the predominance of regenerative processes starting as early as the period of acute inflammation. Edema of tissues decreases, blood circulation improves, and metabolism is normalized. Wound cleansing, inflammation reduction, resorption of non-viable tissues and fibrin clots occur. It is necessary to create conditions for the formation of granulation tissue (antiseptic solutions, ointment dressings, rare dressings).

The third phase - epithelialization (closure of the wound defect): characterized by the formation of epithelial tissue, which closes the wound defect. Along with this, the scar tissue is formed from the granulation tissue (active movement, ointment dressings, rare dressings are used).

The duration of each phase depends on the nature of the wound, methods of treatment, the general condition of the body and the presence of infection [9-11].

Types of wound healing

1) Primary tension

2) Secondary tension

3) Healing under a scab

By primary tension, wounds heal with even, well-adjoining edges, in the absence of infection. Healing occurs on average for 6-8 days with the formation of a thin linear scar. Secondary tensions heal wounds with gaping edges, a deep zone of tissue damage and in the event of a wound infection. Foreign bodies and substances of microbial origin prevent the primary tension. Secondary healing is a long process (several weeks). The scar is rough. When it is wrinkled, contracture of the joint may occur (if the wound was located in the joint area) and deformation of this part of the body.

Healing under the scab: For minor skin lesions in the wound area, blood and lymph protrude, which coagulate to form a crust - a scab. The healing process under the scab follows the general principles, only much faster, since the scab performs the function of a biological dressing, protecting the wound from traumatic injuries and secondary microbial contamination. Therefore, it is not recommended to mechanically damage or remove it until it falls off on its own [12,13].

Features of wounds in children: Children are more likely to be injured when hitting a hard object, when falling, from pranks with a sharp and cutting tool. Due to the elasticity of children's skin and the well-developed subcutaneous fatty layer of the wound edge in children, they are rarely torn or crushed, even when struck with a blunt object. Mostly we have to deal with small superficial skin wounds.

To assess the severity of the wound: It is necessary to clarify the location and size of the wound, the intended course of the wound channel, the presence of complicating factors (continued bleeding, damage to the nerve trunks, bones), and the possibility of damage to internal organs. When examining a wound, the shape and condition of its edges and surrounding tissues, the severity of marginal necrosis discharged from the wound (admixture of blood, pus, urine, feces, and bile), pain, and infiltration are evaluated. The first (emergency medical) help for injuries is aimed at protecting the wound from secondary contamination, stopping the bleeding and creating rest for it. It includes:

1. Stopping bleeding. The weak is usually possible to stop with a pressure bandage of gauze bandage. In case of heavy bleeding, in addition to the dressing, a tourniquet is applied to the limb area above the wound. In a clinical setting, a doctor may apply a sterile hemostatic clamp to a vessel in a wound to temporarily stop bleeding and tamponade (filling a wound or cavity with a gauze pad, etc.) in the pelvic and buttock area.
2. Treatment of the skin around the wound with iodine and alcohol so that liquid does not get into the wound.
3. The imposition of aseptic (protecting from infection) dressings - sterile wipes with its fixation with a bandage or cleol (adhesive liquid to strengthen the surgical dressings) or sticky adhesive.
4. If this is required by the condition of the victim (the degree of injury) - the introduction of painkillers (analgin, promedol).
5. If necessary, apply immobilization - ensuring the immobility of the damaged or diseased part of the body.

Complications of wounds:

1) Bleeding

2) Shock

3) Purulent, putrid or anaerobic infection

4) Damage to internal organs.

Specific bite wounds.

Bitten (caused by teeth) wounds and scratches - the kind of damage that occurs when an animal attacks a person - most often they are inflicted by dogs.

Lena M, 12 years old: "We played hide and seek, but he looked at me and pounced, began to drag my leg like a booty." The mother caring for her daughter adds that the neighbor's dog, the Rottweiler, walked without a muzzle, rushed uncontrollably, so the policeman who came to the rescue to help her had to shoot her.

Sasha G, 13 years old: "A friend's Doberman bit my hand. True, I made a move, but we are not familiar with the first day. And so, the dog is good. "

In Rita M, 13 years old: a bitten scalped head wound is the "work" of a Staffordshire terrier friend. "Dog" has already attacked a 4-year-old child, but only scratched. Not just once did the stuff go to Rita. On that ill-starred day, the girl stumbled and fell, and the dog grabbed her head.

Katya P, 10 years old: has many bites. From pain and resentment, she cannot hold back tears. Before the incident with Katya, the bull terrier twice attacked the children, but the owner simply took the dog away. The statistics make a depressing impression: the number of children affected by

dog bites remains consistently high and continues to grow steadily. According to the metropolitan administration of the Federal Service for Supervision of Consumer Rights Protection and Human Welfare (Rospotrebnadzor), in Moscow from 25,000 to 28,000 cases of people being bitten by animals, primarily dogs, are annually recorded. The number of children who have been bitten remains stable. Only in the capital - up to 10,000 per year. On average, 300-400 small Muscovites annually after bites are admitted to hospitals in serious condition - with crushing wounds and open fractures.

The population is growing not only in the capital, but throughout the Russian Federation (RF). With an increase in wealth, citizens are more and more pets of pets, mostly dogs. If we conditionally take the population of Moscow for 10% of the total in the Russian Federation, it is easy to imagine how many residents suffer from dogs throughout the country.

Most often, "prosperous" dogs rush to people, having owners, mainly Rottweiler's, bull terriers, Staffordshire terriers, representatives of fighting breeds of an aggressive nature, who were specially trained for fighting and guarding. As practical experience shows, such dogs cannot be kept at home, and their uncontrolled breeding and selling to private individuals should be prohibited, leaving only for protection. The right to their maintenance should be equated to the right to carry firearms, and these dogs need to be walked only in muzzles and on strong leashes. The dogs of these breeds are uncontrollable, they are genetically "programmed" to aggression and the destruction of the victim. And the situation is really terrible. Mistress Staffordshire Terrier, leaving, gave the dog to her friend. The next day, her two-year-old daughter hit the dog in the face with a toy. Stuff rushed at the girl. He also gnawed at the hands of the uncle of a child who came running to help - a policeman who did not have a weapon. Fortunately, managed to throw the beast from the 7th floor. There was a case when a dog bit off a 13-year-old girl's finger and swallowed him.

It can be assumed that sometimes children themselves provoke animals to aggression, but here is a case that refutes this opinion: a mother with a baby in a stroller came to visit a friend with whom the Rottweiler and bull terrier lived. While the women were talking in the kitchen, the dogs bit the baby, bit off his ear. Who here showed aggression?

At the same time, the Russian dog breeds that protect gardens and vegetable gardens, although they may bite, but behave towards children less aggressively and cruelly. But the jaws of the bull terrier break bones even for 13-14 year old. This leads to open fractures, infection by pathogenic micro flora from the oral cavity of animals, severe complications in the form of osteomyelitis. And if the dog is unknown, does not have a host, there is no data on the conduct of compulsory vaccinations, it is still necessary to be vaccinated against rabies for 2-3 weeks, which can be prevented only prophylactically - the sick cannot be saved.

Bites are dangerous not only by mechanical damage to tissues, but also by the threat of developing a serious infection due to falling into the wound of the pathogenic flora from the mouth of an animal [14,15].

The most dangerous threat of this kind is rabies, a deadly acute infectious disease caused by a virus that infects the central nervous system. According to official data in the Russian Federation, its persistent natural foci associated with diseases of wild predators are registered in 61 of 85 regions [1]. Domestic animals are actively involved in the epizootic process (the emergence and spread of infectious diseases), which increases the risk of spreading the disease among people. Protect against this disease can only be preventive, through vaccinations before it starts. And if time is missed and a person falls ill, it is already impossible to save him. It would seem that this is an elementary truth, but, to the great regret, some people neglect them and part with life. We have to admit: "... the population is not informed about wariness and measures to prevent rabies." And this is not just a medical problem. Both teachers and parents should contribute to its solution [16].

Adults need not only not to forget about this threat themselves, but also to tell children about it, and also to take care to exclude their contacts with stray animals, primarily the homeless.

It is important to remember: when biting a dog and another animal, along with the use of conventional first aid measures, it is necessary to find its owner and find out whether it has been vaccinated, to ensure that the pet that bit the person was presented to the veterinarian and placed under observation. If this is not possible, there is no reliable information about the animal and the mandatory vaccinations given to it, except for the bite treatment, the victim needs to be vaccinated against rabies for 2-3 weeks. And they need to start as soon as possible.

In any case, even if the bite is small, the animal was vaccinated against rabies, and the victim feels well, you still need to show him to the doctor and tell who has bitten. If the bitten is not vaccinated - the introduction of tetanus toxoid and toxoid is necessary.

Common signs are characteristic of the bitten wounds, however, there is no significant external bleeding, and inflammatory changes quickly join.

Treatment: superficial lesions are treated with antiseptic dressings (alcohol-furacilin dressings). With deeper wounds-excision of the edges without the imposition of primary sutures. In unvaccinated patients, the introduction of tetanus toxoid and toxoid is mandatory.

Complications of purulent wounds

1) Erysipelas;

2) Lymphangitis;

3) Lymphadenitis;

4) Fulminant sepsis.

With bitten wounds, it is imperative to resolve the issue of rabies vaccinations [17].

Snake bites require energetic and correct action. If the snake is poisonous, lost time can result in very serious consequences. Nowadays about three thousand species of snakes are known. About 500 of them are dangerous for humans.

During the bite, the snake injects a small amount (0.02-0.1 ml) of poison into the tissue. According to the mechanism of toxic action, poisons of all kinds of snakes are divided into three groups:

1. Predominantly neurotoxic (curare-like) - causing paralysis of the motor and respiratory muscles, depression of the respiratory and vasomotor centers of the brain (the poisons of the cobra and other snakes of the family of asps, sea snakes of tropical coastal waters).

These poisons cause pain, dizziness, low blood pressure (fainting is possible), numbness of the face and tongue, impaired speech and swallowing, especially when drinking. Ascending paralysis arises quickly, starting from the lower extremities, an unstable gait, then an inability to stand on one's feet, to move, and finally a complete paralysis that spreads to the body, including the respiratory muscles. Breath after a bite quickens, then becomes more rare (paralysis of the respiratory muscles and depression of the respiratory center). The victim has a broken heart rhythm.

If the poison immediately enters the blood or lymphatic vessel, complete paralysis and death can occur 10-20 minutes after the bite. With the usual intradermal intake of poison, intoxication reaches a maximum after 1-4 hours. The condition of the injured remains severe for the first 24-36 hours. With other things being equal, the poisoning is more severe in children and women, as well as persons under the influence of alcohol.

2. Poisons of predominantly hemorrhagic, blood coagulating and local edematous-necrotic action (viper poisons - gurzy, efah, common viper, etc., as well as common mordant, Far Eastern, rocky, etc.) already in the first minutes edema occurs. Gradually, the bitten part of the body becomes more and more edematous. The skin over the edema shines, becomes purple-bluish color, covered with spotty hemorrhages in the form of bruises. They can form bubbles with sero-hemorrhagic contents, and in the bite zone - necrotic ulcers. Wounds (puncture marks of the skin with poisonous teeth) can bleed for a long time, or produce a sero-succinic edematous fluid.

General toxic symptoms - excitement, alternating with severe weakness, pallor of the skin, dizziness, small and frequent pulse, decrease in blood pressure. Fainting may occur. Nausea and vomiting occurs. Develop a picture of severe shock. The volume of circulating blood decreases, the central venous pressure decreases. In milder forms of poisoning, general toxic symptoms are mild and a limited local edematous-hemorrhagic reaction to the poison prevails. All manifestations of intoxication reach maximum severity after 8-24 hours. With inadequate treatment, the patient's condition remains severe for the first 2-3 days after the bite. There may be complications in the form of long-healing ulcers, gangrene, purulent processes (abscesses, phlegmon, etc.). Most often, these complications are associated with improper provision of emergency care and additional traumatization of soft tissues by cauterization, constriction, and piercing with oxidizing agents.

3. The third group includes poisons that have neurotoxic and hemorrhagic (rattlesnakes of Central and South America, Australian asps, some species of vipers of tropical fauna that live mainly in Africa and the Middle East) [18,19].

Signs of a snake bite

A puncture wound (usually double) of small diameter, resembling a needle prick. The bite of a non-poisonous snake leaves 2 strips of fine small scratches on the body. The bite of a venomous snake also leaves 2 strips of scratches, but at the end of each strip there is a puncture from the canines. In the place of the bite of a poisonous snake, a local reaction of the body is usually observed - hemorrhagic edema and necrosis occur.

Rapidly spreading painful swelling of tissues, sometimes causing an increase in the limb to double the volume. It should be taken into account that weakened people, allergies, children and women show a higher sensitivity to poison.

Common phenomena depend on the amount of poison and the area of the lesion. Bites are especially dangerous when poison is introduced into small veins. In addition, the closer the bite to the head, the more dangerous it is [20].

General symptoms of a snakebite when bitten by a poisonous snake, in addition to bite marks and swelling, the human body may have the following symptoms:

- First, a slight burning sensation, which turns into an increasing pain at the site of the bite
- The skin in the area of the bite acquires a reddish-bluish tinge

- Numbness of the bitten area appears. The pain can spread throughout the limb, sometimes goes to the torso
- Muscle weakness appears and coordination of movement is disturbed (staggering gait, difficult to stand)
- Breathing is depressed, becoming increasingly rare, superficial and difficult. Pulse frequent and weak. Reduced pressure
- Skin becomes pale
- Speech and swallowing disorder occurs
- Possible: severe salivation, insurmountable drowsiness
- Body temperature rises to 38-39° C
- Fever begins. Dizziness, nausea, vomiting appear
- Sight is impaired (in the eyes of "doubles")
- Possible periodic loss of consciousness. Sometimes arousal and convulsions

Danger of being bitten by a poisonous snake: Depending on the strength and amount of poison, as well as not providing proper first aid, a person may die from a poisonous snake bite in a time frame from 30 minutes to 7 hours. Sometimes a day or more.

With the bites of a cobra and other snakes of the first group, the victim has pain, a feeling of numbness. Local changes in the bite zone are very minor and are no longer associated with the action of poison, but with traumatic local therapeutic effects (cauterization, suction, rubbing, etc.). Dizziness, low blood pressure, fainting, numbness in the face and tongue, speech and swallowing, especially when drinking. Ascending paralysis begins quickly, starting from the lower extremities (unsteady gait, then the inability to stand and move, and finally, complete paralysis that spreads to the body, including the respiratory muscles. Breathing after a bite is briefly increased, then it becomes more rare (paralysis of the respiratory muscles and depression of the respiratory center). The victim's heart rhythm is disturbed.

Cases occur when the poison immediately enters the blood or lymphatic vessel (complete paralysis and death may occur in the first 10-20 minutes after the bite). With the usual intradermal intake of poison, intoxication reaches its maximum after 1-4 hours. The condition of the victims remains extremely difficult during the first 24-36 hours. Other things being equal, the poisoning is more severe in children and women, as well as in persons alcohol intoxicated.

When bites of snakes of the viper family and the genus of shchitomordnikov swelling occurs in the first few minutes at the site of the bite. Gradually, the bitten part of the body becomes more and more edematous. The skin over the edema shines, becomes purple-bluish color, covered with spotty hemorrhages in the form of bruises. They can form bubbles with sero-hemorrhagic contents, and in the bite zone - necrotic ulcers. Wounds (puncture marks of the skin with poisonous teeth) can bleed for a long time, or produce a sero-succinic edematous fluid. General toxic symptoms are characterized by agitation, alternating with severe weakness, paleness of the skin, dizziness, small and frequent pulse, decrease in blood pressure. Fainting may occur. The patient has nausea and vomiting. Develop a picture of severe shock. The volume of circulating blood decreases, the central venous pressure decreases. In milder forms of poisoning, general toxic symptoms are mild and a limited local edematous-hemorrhagic reaction to the poison prevails. All manifestations of intoxication reach maximum severity after 8-24 hours. With inadequate treatment, the patient's condition remains severe for the first 2-3 days after the bite. There may be complications in the form of long-healing ulcers, gangrene, purulent processes (abscesses, flegmon, etc.). Most often, these complications are associated with improper provision of emergency care and additional traumatization of soft tissues by cauterization, constriction, piercing with oxidizing agents (potassium permanganate, etc.).

Symptoms of poisoning: headache, sweating, weakness, vomiting and diarrhea. Pulse frequent, weak filling. In severe cases - a sharp drop in blood pressure (collapse). Death caused by respiratory paralysis occurs within 2-7 hours after the bite.

The bites of some snakes do not lead to deaths, but are very unpleasant and painful.

First aid for snake bite:

1. Keep calm!

2. Immediately after the bite - vigorous suction of poison from the mouth (if there is no damage to the oral mucosa, gum disease and carious teeth), a rubber bulb, a medical jar.

Punctures made by poisonous teeth quickly heal, therefore, they must be "opened" before sucking the poison. To do this, grab a fold of skin at the site of the bite and remember it with your fingers, but not very much. Punctures usually open and small droplets of liquid protrude in their place. Now you can proceed to the suction.

If it is started immediately after a bite, it allows you to remove 30-50% of the poison introduced by the snake and thereby significantly reduce toxicity. The procedure is safe, since snake venom caught in the mouth and stomach does not cause poisoning. Suction should be continued for 10-15 minutes, spitting out the contents of the wounds. It is

extremely important that the affected limb at the same time remained motionless, since movements increase lymph outflow and significantly accelerate the flow of poison into the general circulation.

If after the bite 3-5 minutes have passed, then this procedure becomes completely useless, because during this time, the poison has time to disperse along the bloodstream and lymphatic ducts.

If the victim is alone, he must suck out the poison himself.

Do not be afraid to help the bitten snake, it is not dangerous, even if you have bad teeth or abrasions in the mouth:

1. You should spit out poison immediately.

2. The amount of poison that can be ingested through the mouth in the body is so little that it does not have a toxic effect. All experienced serpentine suck poison and themselves, and comrades, and there was not a single case that the suction poisoned. Nevertheless, it should be remembered about the danger of transmitting various infections through blood or saliva, therefore, after sucking off poison, you should rinse your mouth with water or a weak solution of potassium permanganate.

3. Disinfect the wound to prevent additional infection in the body. For this you can use iodine or brilliant green, 40o alcohol solution (vodka).

4. Apply a sterile dressing to the disinfected wound.

5. From the very beginning, the victim of a snake bite should be provided with rest in a prone position (at the site of the bite and during transportation to the hospital) and immobility of the affected limb, which in no case cannot be moved. To do this, you can even impose a tire, or wind it to a healthy leg (autoimmobilization). If a hand is bitten, then lock it in a bent position.

Independent movement of the victim is unacceptable! The more a person moves, the faster the poison spreads throughout the body.

6. The victim must be given plenty of drink, because it contributes to the removal of poison from the body (warm, weak sweet tea or water).

7. To prevent and (or) reduce the body's allergic reaction, give antihistamines, for example: Suprastin or Tavegil.

8. Urgently deliver the victim to the hospital. The use of a specific mono-or polyvalent anti-serum anti-serum is carried out in case of poisoning with the poisons of the most dangerous snakes (cobras, gyurza, efy) and in severe forms of other intoxications. Anti-serum serum is administered in the provision of medical care intramuscularly for 30–80 ml (depending on the severity of intoxication). Anti-inflammatory serum in 1-2% of patients can cause anaphylactic shock, which is more dangerous than poisoning from snakes of the temperate belt. Therefore, anti-serum serum is used only when assisting bitten children aged 3-4 years and in rare cases of severe poisoning.

The snake that bit the person must be found (or reliably seen) and delivered to the doctor for identification in order to eliminate any doubts about the course of treatment of the person bitten by the snake.

Aid for cobra bites and lesions with other neurotoxic poisons includes, in addition to the use of a specific serum countermeasure, intravenous administration of 0.5 ml of a 0.1% solution of atropine and the subsequent administration of 3-6 ml of a 0.05% solution of proserin, which weakens the poison-like effect including paresis of the respiratory muscles.

9. With sudden respiratory depression, mouth-to-mouth artificial respiration should be performed. Emergency delivery of the bitten to a medical institution must be carried out [21,22].

Contraindicated in snake bites:

1. Cauterizing the bite site with objects heated with fire, charcoal from the fire, gunpowder, as the poisonous teeth of snakes reach a centimeter in length and the poison is injected deep into muscle tissue. At the same time, a scab forms at the site of cauterization, under which suppuration begins.

2. Piercing it with any preparations. It is dangerous and useless to cauterize the bite site with caustic potassium, nitric, sulfuric, and carbolic acids.

3. Cuts and other local effects, including cutting the bite crosswise or cutting the affected area. Cuts by accidental objects (knives, glass fragments) lead to infections, damage to veins, tendons.

4. The imposition of a harness on the affected limb, improvised constrictions, as a rule, is contraindicated, as it increases the severity of intoxication, provokes gangrenous phenomena (especially when bite bursa, viper), increases the possibility of death.

Only when a cobra bites, the poison of which does not cause local violations of tissue trophism and quickly spreads through the blood vessels, is it possible to slow the development of general intoxication by applying a tourniquet above the bite site by 30-40 minutes.

5. Alcohol in all its forms is strictly contraindicated. Alcohol is not an antidote, but on the contrary, complicates the removal of poison from the body, increasing its effect [19, 22].

The victim must be urgently taken to a hospital where intensive therapy is carried out in the toxicological or intensive care unit (hormones, desensitizing drugs, vitamins, respiratory analeptics). Specific antimutagenic serum is used in cases of poisoning with the poisons of the most dangerous snakes (cobras, gurza, efy) and severe forms of other intoxications.

Currently, it has become fashionable to keep snakes, including poisonous ones, in home mini zoos. In the US, about 1.5 million "home" snakes. The victims of their attacks are often caring owners.

Behavior of venomous snakes that you need to know in the middle lane, most venomous snakes are active around the clock. They like to bask in the sun, including they can do it right on the trail, on stumps, hummocks and stone slabs, and crawl to a bonfire at night.

When meeting with a man, the snake is usually trying to crawl away. The approaching steps of the snake (devoid of hearing) are perceived through the vibrations of the soil. There are almost no fluctuations on the soft peaty bedding or on the dug up soil, and the viper sometimes does not have time to hide in advance.

Snakes never attack without warning! Cobra threat pose - anterior third of the body raised vertically, bloated hood, swaying from side to side, hissing, and resembling sneezing, throwing in the direction of the enemy. A cobra is able to make a throw equal to the third part of the length of her body. The irritated shtekhomordnik finely shakes the tip of the tail. In the pose of threat, the efa is folded with two dense half-rings, in the middle of which it slightly raises the head. Vipers and gyurza, threatening to throw, roll up a plate, zigzag arch of the front part of the body, hissing much. The hiss of a gurza reminds a sound of the air pump which is pulled out from an opening of the manual pump [22,23].

Prevention

1. Caution while staying in nature.

2. Dense, not tight fitting body pants tucked into shoes, thick woolen socks.

3. Wear leather or rubber boots, especially in the evening and at night, when snakes are most active.

4. When picking mushrooms and berries, it is better to push the tall grass with a long stick, and if you intend to give special attention to the overgrown hummock, move the stick in it before putting your hands in it.

5. Suddenly noticing a creeping snake, freeze, let it go. If the snake took the pose of a threat, slowly back away. Avoid sharp, frightening snake movements! It is impossible, in defense, to put your hands forward, turn your back to the snake. If you have a stick, hold it in front of you towards the snake. Do not run away from the snake encountered - you can step on another unnoticed. Keep calm in decisions, actions, and gestures. Remember, a snake that you do not see is dangerous, a snake detected does not pose a threat.

6. Care should be taken when dealing with dead snakes; for some of them, the poison retains its properties for a long time. Accidental injection with a poisonous tooth can cause poisoning.

7. Don't try to catch snakes or play with them unless absolutely necessary, even if they are small in size and seemingly sluggish. Poisonous and newly hatched young snakes are poisonous [20,22,24].

How were snake bites treated in the middle Ages?

People long ago, from ancient times, tried to find a cure for snake bites. Medieval doctors considered cutting off a bitten limb as one of the most reliable first-aid tools. It is clear that it was necessary to do this immediately after the bite, otherwise the poison spreads through the body and it is already useless to chop hands and legs. And there are still people who are so scared when they are bitten by a snake, that they put a hand on the nearest stump and chop it with an ax, well, if only a finger.

In antiquity in England there was a remarkable antidote. It was believed that if the bitten person had time to jump over the water, even the drainage ditch, before the snake is out of sight, he will get rid of the poison and will not die.

But only about fifty years ago, doctors understood how snake venom acts and what needs to be done to weaken its effect. It is necessary to remember that no traditional medicine knew and does not know how to treat snake bites. All, without exception, "popular" means are useless at best, but more often they are harmful. Scientific medicine until recently did not know how to treat the bites of poisonous snakes. So, from hopelessness borrowed funds from ancient ritual medicine. In Russia, where snake bites are rare, many doctors still know very poorly what to do in such cases.

Any unfamiliar snake should be considered deliberately poisonous, but it is advisable to study the signs of harmless and poisonous snakes before the hike. For example, it already differs by two bright yellow spots in the temporal region of the head.

The amount of poison that a poisonous snake emits during a bite is disproportionately more than the amount of poison that a poisonous insect can release during a bite and therefore snakes are much more dangerous than spiders, scorpions and other poisonous animals [22].

Arthropod bites (scorpions, tarantula spiders, karakurt, some foot legs and insects such as mosquitoes, bees, wasps, hornets, horseflies, etc.) can cause neurotoxic, hemorrhagic and histamine-like poisons.

A karakurt spider bite can be deadly for both humans and animals. Under natural conditions, karakurt eats mainly small insects. A karakurt will not attack a person on his own, he bites only in cases when he is disturbed or attacked. The most poisonous are karakurt females, which emit a strong poison that causes atrophy and gangrene of soft tissues.

Signs: pain, itching, swelling, redness in the area of the bite. Its place is defined as a red dot, a drop of blood sometimes appears, and later a purple spot may appear, a dry scab or a blister with a bloody liquid is formed.

Such bites can be complicated by the development of phlegmon or erysipelas. Patients complain of deterioration of health, headache, insomnia, weakness, fainting. The body temperature rises, chills, nausea, and vomiting appear. In more severe cases, local and general convulsions, impaired cardiac and respiratory activity, abdominal pain, diarrhea mixed with blood, paresis, the phenomenon of collapse and shock. A rash may appear on the skin. All these phenomena gradually disappear by 3-7 days, but sometimes for a long time there can be general weakness, pain in the extremities. After multiple bites, death can occur.

Bees not carrying a serious threat to other people, a bee sting can cause a threatening reaction in those who are allergic to bee venom.

If the edema spreads to the respiratory tract, it can be fatal. Therefore, after a bite of a bee, wasp or hornet at the first signs of urticaria (an allergic reaction of the body with a sudden and rapid appearance on the skin, sometimes on the mucous membrane of the larynx, rash, and wheals with severe itching) or difficulty breathing, you should immediately call an ambulance. And after the attack of a swarm of bees or single bites of more poisonous arthropods, you should immediately consult a doctor [24-26].

First (first emergency) help:

1. Remove the sting from the wound.

2. Wash the bite site with hydrogen peroxide, smear with tincture of iodine and apply cold or wet dressings with potassium permanganate (potassium permanganate) or Burovsky liquid.

3. When bites are particularly poisonous arachnids (scorpion, karakurt) - try to reduce the amount of poison in the wound by squeezing or sucking.

4. The wound can be slightly dissected and washed with a 1% KMnO4 solution (potassium permanganate).

The patient must drink plenty of water. Doctors use painkillers, sleeping pills, heart drugs, local procaine blockade. In severe cases, intravenous fluids. Intramuscular injection of a special serum.

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