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Review article

Scorpion sting prevention and treatment in ancient Iran

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ABSTRACT

Due to the medical and therapeutic importance of scorpions in Iranian traditional medicine, this review was conducted on the treatment of scorpion sting as performed by traditional healers in order to realize complications, clinical manifestations, diversities, and deficiencies in the prevention, control, and treatment as mentioned in the pertained literatures. This study tried to make known and investigate attitudes of the Iranian national and traditional medicine towards controlling these venomous animals. Keywords and articles were searched through relevant sites on the Internet. We investigated different journals and references for the Iranian traditional medicine. Based on the articles and books found, we tried to find suitable solutions to problems from the viewpoint of traditional medicine. Scorpion sting dates back to ancient Iran and has been widely reflected in the resources of Iranian traditional medicine. The traditional medicine offers various guidelines that can be beneficial in this respect. New attitude towards scorpion sting with regard to traditional medicine resources can enhance control and prevention of scorpion stings. Consequently, this attitude leads authorities and researchers to a decreased level of scorpion stings or related consequences.

1. Introduction

Scorpions are fascinating animals. Their venom with various potentialities has made them look both scary and fascinating.[1] The venom of some species of scorpion has a remarkable impact on religious attitudes, concepts, and views of different societies in the east and west. These beliefs and conceptions were very common in old societies. Also, they are believed by a few traditional groups in some parts of the world.[2] Ancient Egyptians believed that scorpions were created through decomposed corpses, crocodiles, and lizards.[3] According to an Algerian legend, a king built a palace for his son. Astrologists had foretold that the son would die one day by a scorpion sting. Therefore, they built the palace using totally smooth and flattened stones to be impenetrable by scorpions. One day, a basket of grapes with a scorpion hidden in it was brought to the prince. The prince was then stung by the scorpion while eating the grapes. Such legends describe to some extent the story of how the human is stung by scorpions.[4] The same story has been repeated in the province of Khuzestan, Iran. Relatives of an authority in Ahvaz Jundishapur University of Medical Sciences (AJUMS) took some vegetables for him. His spouse was stung by a scorpion while cleaning them, and lost her life some days later. This story confirms that most of the legends originate from reality.[5]

Treatment of those stung by venomous animals and their safety in ancient Iran has contributed to the formation of various stories and legends. Mithridates VI was a cautious man and because he was afraid of being poisoned by his solders, he was accustomed to use some poison in his food every day. The king was coincidentally defeated by the Romans; then, he decided to commit suicide. However, whatever poison he ate he did not succeed, so he ordered one of his soldiers to stab him. It seems that getting accustomed to a little and then gradually more amounts of poison has been common in ancient Iran. On this occasion, Mithridates VI is known as the first immunologist in Iran. Mithradatism is the practice of protecting oneself against a poison by gradually self-administrating nonlethal amounts for the body to become accustomed to the poison. Later, Galen made an antidote and named it Therikos Mithridatus.[6] In countries such as Sudan, scorpions are put in sesame oil to make medicine for those stung by scorpions. This oil is rubbed on the site of sting.[1]

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Scorpion sting is one of the main health problems in developing, tropical, and subtropical countries causing immense clinical consequences and sometimes death.[7] The status of scorpion sting varies in different regions and countries due to lifestyle, economic–social status, residential status, way of providing health services, and species present in every geographical area.

Scorpion sting is one of the main medical concerns of some African, Middle Eastern, Eastern, and Central American countries.[8] Mexico has the highest rate of scorpion sting and mortalities.[9] A total of 300,000 cases of scorpion sting are reported annually in Mexico.[10] In 1995, 7000 cases of scorpion stings occurred in Brazil, and 1% were fatal despite receiving antivenom serum.[11] Scorpion stings constitute 40,000 cases of medical problems in Tunisia every year. No evidence has been found regarding efficacy of antivenom serums in treating scorpion sting.[12] Morocco is faced with 40,000 cases of scorpion stings annually.[13] More than 20 species of scorpion exist in the Arabian Peninsula and their stings result in death in some cases,[14] and 86 species of scorpions has been found in India. The mortality rate of scorpion stings has been 3–22% for children.[15]

Iran, due to its climate and weather, is very rich in arthropods especially scorpions.[5] Iran is one of the countries with a vast variety of scorpions, especially dangerous species. Reports of scorpion stings are obviously notable in the old Iranian sources. To treat stings, different drugs under the name of antidotes, applying medicines, and ointments have been introduced. These varieties of medicines prove that scorpion sting has always been a main medical concern in the previous historical eras.[16] In a manuscript dated 1908 AD, cities such as Tehran, Ghazvin, Ghom, Kashan, Tafresh, Khoramshahr, Ahvaz, Soleymanieh, Korestan, Kerman, Bampour, Shoushtar, and Shahroud have been mentioned as the cities with the most scorpion stings and related problems.[4] This confirms the deep-rooted dominance of scorpions in Iran.[5] Also, in recent decades, cases of scorpion stings and related mortalities are being reported annually in Iran.[17] Thus, it can be said that arthropods are the most dangerous venomous animals in Iran.

Scorpions have been long known in Iran due to their stings; therefore, there is considerable need for the prevention or treatment of their stings. In the traditional sources and texts, ways of treatment, and getting rid of and destroying scorpions have been discussed in detail. At present, the main way for treating scorpion sting (of any species) in the world and Iran is the use of antivenom serum, which has been under question in the treatment of some cases.[18] Due to the significance of scorpion sting in the world and Iran in particular, study of this matter along with the related therapeutic methods especially in the light of ancient and traditional medicine of Iran is of vital importance. Therefore, our aim is to find applied methods proposed in the traditional medicine to manage and handle the problem, at least in parts of the world.

2. Methods

This descriptive review was done by searching keywords such as traditional medicine, scorpion sting, and treatment of scorpion sting through relevant websites, specialized journals, articles, and books. All the articles and sources covering detailed and technical description of scorpion sting and its treatment, traditional medicine, prevention and control of dangerous species were studied; and the rest were excluded. Articles not related directly to the study and those studying other aspects of scorpions such as the biochemical aspect of venom, were omitted. All articles and reference books published in the past 30 years in the Persian scientific journals were studied and finally different points of view of various authors about prevention, control, and treatment of scorpion sting in the traditional medicine were offered. Out of 85 sources, 47 were selected and analyzed based on their potentiality and usefulness.

3. Results

3.1. Legend and travellers' reports

Scorpions have always been hated by human being because they have almost always been associated with sin and criminality.[4] Fear of mad dogs, scorpions, and other venomous animals was very common in the Middle Ages and various books were written on preventing or treating related diseases.[1] The same therapeutic perspective is present in the Iranian literature.[2] In some countries, people often carry an image of a scorpion with them to guard themselves against scorpion sting. In Iran, images of scorpions have been discovered carved on silver objects. Also, we can find legendary texts about scorpions' behavior. One of these texts deals with the point that if one scorpion is placed in fire, it stings and kills itself.[1] These types of thought about scorpions are still predominant among Iranian people.

Scorpions have attracted attention due to their venomous, painful, and sometimes deadly stings. Like other nations, the Iranians have had scorpions in their legends since long ago.[5] When Mithras, Iranian god of the sun scarified a sacred cow for its blood to fertilize the world, a mischievous demon sent a scorpion to sting the cow's testicles for destroying its source of life.[1] The ancient Iranians used to hold the women's celebrations on Sepandārmazgān, the 5th day of March. They called it good news (Mozd). On this day, in addition to giving presents to women, a ceremony was conducted to prevent scorpion sting.[4] Killing animals, vermin (or destroying Kharfaster) was very common in the ancient Iran so that it was considered as one of the main oblations.[6] Scorpions were also involved in the fate of wars in Iran. In the late Sassanid period, Kashan was so famous and thriving that it sent an army of warriors headed by Shirzad to fight with the Arabs. The army of Abu Musa Ashari, the Arabian commander was encountered with persistence and tenacity. Abu Musa Ashari, who was disappointed to not capture Kashan, distributed pitchers of scorpions throughout the city. The people stung by the scorpions gave up and were soon surrounded. The Arabs soon after killed the people, looted properties and animals, and took the soldiers captive.[19]

A number of Western travellers wrote things about scorpions in their itineraries that often did not match reality. Sir Thomas Herbert, in one of his journeys in 1626 described scorpions of Kashan: "Scorpions are small snakes with long fingers. These animals sting just by their tails and some of them fly exceptionally. Their stings create panic and inflammation which result in death in some cases. There are some scorpions that avoid the maniacs."[1] These reports from the Ancient Iran remained in the religious and historical texts prove the archaism of this issue in Iran.

3.2. Sporadic rate of mortality of scorpion sting

Due to the existence of these animals all over Iran, which provides them with a desirable climate for survival, scorpion sting has been a frequent problem in Iran. Therefore, the Iranians should have gathered comprehensive and complete information to control and treat scorpion sting.[20] Despite damage brought to the scientific and cultural body of Iran during wars in different periods, sources available and accessible to the Iranian in the past illuminate like a gem in the ancient scientific world.[21] By contrast, Iran has been a cradle of civilization for centuries and has presented precious scientists to the world of medicine.[22]

In the modern era, studies on scorpions were started more seriously with the onset of great wars from the 20th century.[23] Medical importance of scorpions was of more concern with the beginning of the imposed wars against Iran. Kamali highlighted cases of scorpion stings in the province of Khuzestan, especially in towns and villages.[24] Radmanesh[25] reported sting rates of 41%, 45%, and 13% for *Androctonus crassicauda*, *Mesobuthus eupeus*, and *Hemiscorpius lepturus* species, respectively in Khuzestan. He also stated a sporadic rate for stings by *Buthotus saulcyi* and *Apistobuthus petriygocerus* scorpions.[25] Radmanesh[26],in another study, investigated the sting of the scorpion *Hemiscorpius lepturus*. He (Radmanesh) said a rate of 10–15% sting by this most dangerous and venomous scorpion in Khuzestan. Zayerzadeh et al[27] in a study points out that about 40% of the total referring to stings ward > 70% of the stings in Ahvaz are pertained to *Mesobuthus eupeus* species. Radmanesh[28] describes more clearly how to treat the patients in different ways. He believes that the classic six As (anesthetic, antibiotic, antitetanic, anitvenom, anti-inflammatory, and analgesic) method is not applicable for scorpion sting in the province of Khuzestan.

According to Radmanesh,[29] 10% of the scorpion stings in Khuzestan are from *Hemiscorpius lepturus*. Dehghani et al[30] reported that 30%, 62%, and 8% of the stings in Kashan are related to black, yellow, and indistinguishable scorpions, respectively. Cases of mortalities related to black scorpion stings have been 5%. Also, one case of sting by *Odontobuthus doriae* species has been reported.[30] Afzali and Pezeshki[31] studied cases of acute renal failure induced by the Gadim scorpion in children in Abuzar Hospital of Ahvaz in 1994. They concluded that renal failure in the Gadim-stung patients is always due to hemoglobin urine.[32] According to Dehghani and Fathi,[33] 42,500 cases of scorpion stings occur annually in the country. They believe that real cases are about 20% more than the estimated amount. This is because a few cases of scorpion stings take place in the remote villages and are not recorded.[33] Scorpion stings are reported from different provinces in the country. Except for Khuzestan, which is always at the top, the placing of some provinces change a little in the annual statistics. Bigdeli et al[34] reported the rate of scorpion stings for 100,000 people of Khuzestan province from 1998 to 2000 as 709 cases, 706 cases, and 733 cases, respectively.[34] The cities of Ramhormoz and Masjedesoleiman, along with rural regions of this province, had the highest rates of scorpion stings.[35]

3.3. Symptoms of scorpion sting

Based on these studies, scorpion stings have been reported from all over the country, but the province of Khuzestan is first in terms of occurrences and related complications. One of the main concerns in managing scorpion sting is recognition of stings of dangerous species. By knowing complications of stings of different species, we can find specific therapeutic methods for each. Stings by *Hemiscorpius lepturus* leave severe complications that have been mentioned in the Iranian old medicine. Ibn Sina (Avicenna), the well-known Persian physician, about 1000 years ago described a scorpion that can undoubtedly be attributed to the *H. lepturus* species based on the clinical signs given in the *Canon of Medicine*.[16] He described that, "Venomous scorpions (dragging its tail) own segmentary bodies with a tapered and sharp tail. Their poison is very strong and is usually very common in Askar Mokaram of Khuzestan. If one is stung by them, one does not feel anything immediately. The day after or on the person feels the pain. The person gets depressed, their complexion gets pale and may take jaundice. After being stung, the tongue is inflamed, site of sting is infected, urinates blood and sometimes dies. Don't neglect if the pain is little because sting of this scorpion is highly venomous and fateful."[16] What is inferred from these clinical manifestations from 1000 years ago is that scorpion sting dates back to centuries ago in Iran and only *H. lepturus* species is accompanied with such clinical signs. Poison of this species has cytotoxic and hemolytic effects (Fig. 1).[26,29,36] Many are stung by this species in Iran especially in provinces of Khuzestan and Hormozgan, which is followed by severe clinical signs particularly in children.[37] *H. lepturus* is an exception among the medical species in terms of clinical manifestations. This arachnid is one of the most venomous animals in Iran.[26] Severe skin inflammation and hemolysis are of clinical complications attributed to this type of scorpion.[29,36] Gadim's clinical manifestations reported by Ramanesh et al[16,28] are the same as that stated by the Persian ancient physicians such as Avicenna, which reveal their current or previous attention in that area.

Avicenna described morphology, habitat, absence of pain at the beginning of the sting, and all the other clinical complications of the above-mentioned scorpion. His findings are surprisingly the same as those gained by proficient physicians in Iran. Avicenna's impact on medicine in the Middle Ages is undeniable. His knowledge was not only applicable in his time,[38] but also useful for us today. In another part of Avicenna's description about the clinical manifestation of scorpion sting, he states that the individual feels a sharp and sudden pain at the site of the sting like a needle penetrating into the body. The individual then begins to sweat; the lips become convulsant and cool; the hairs become dry; the male sexual organ seems longer and more erect than usual; the sting feels fiery hot; the individual's complexion is altered totally; a kind of sticky liquid comes to the lips and sticks to them; and sticky tears are coagulated in the corners of the eyes.[16] These clinical signs indicate that this Persian scientist was talking about scorpion sting with neurotoxic venoms, which have been widely discussed in detail by Iranian and other scientists in the modern era (Fig. 2).[7,27] Studies on the effect of venoms of these scorpions on laboratory animals[39] demonstrate how Avicenna precisely explained the situation 1000 years earlier. This proves that Avicenna reported clinical manifestations of those stung by scorpions based on the type of venom.

3.4. Treatment of scorpion sting

Most of the scorpions in Iran and other parts of the world possess neurotoxic poisons; therefore unrestrained knowledge of Avicenna could be useful for the researchers and physicians in tropical and semitropical regions. According to another reference, each patient is treated individually in traditional medicine because their temperament is a mixture of four humors and the balance is

Fig. 1. A deep scar remaining from a large necrotic wound at the site of sting by *Hemiscorpius lepturus* in a 40-year-old woman. The victim experienced an unhealed wound for 6 months in Baghmalek in Khuzestan province, Iran.

Fig. 2. An 8-year-old boy stung by *Androctonus crassicauda* on his leg was in coma for 72 hours. He survived without any wound on the site of sting, Kashan, Isfahan province, Iran.

different from one person to another.[20] At present, all researchers agree with this principle and believe that treatment of scorpion sting varies in different victims based on their individual and genetic characteristics. Of course, in age, sex, and weight groups, clinical complications of certain species are similar. In other words, there are fixed basics that should be considered in the treatment.[17,28]

Therefore, due to the problem of scorpion sting in Iran especially in some regions, experienced local physicians familiar with traditional medicine and environmental factors are needed. This improves quality of treatment and offers a general applicable therapeutic protocol for each patient.

In Iranian traditional medicine, various first aid methods have been used as the primary and general basic prior to manage scorpion sting. One of the suggestions by Abu-Hsab et al in this regard is as follows: "… before doing anything, site of the sting must be sucked just like the way mentioned in the chapter on absorbing poison."[20] Further, as Zink reported "To save the patient, bloodletting can be done at the site of the sting to let the blood along with the poison out of the body or else the site can be sucked under certain circumstances. Also, the site can be cupped to let the poison out with the blood."[40] Furthermore: "The poison must be drawn out of the body and then medication should be done."[41] As stated in these texts, ways of neutralizing the poison or drawing it out of the body have been common since long ago. Some of the ancient first-aid practices are still used in the present time. Methods of drawing the poison out of the body are nowadays practical and recommended in the modern medicine with few changes.[17,28] Drawing the poison out of body by lancetting or by sucking is still ordinary as a primary action in most of the scorpion-prone areas. This method is relatively dominant in Aran and Bidgol, a scorpion-prone area in the province of Isfahan.[42] Therapeutic effects of these methods depend on the precision in drawing the poison out of the victim's body. Evaluation of these methods involves further investigations in this respect.

Application of hot steam and warming the sting site is one of the methods of treatment recommended in traditional medicine.[16] In other references, use of hot pennyroyal syrup at the site is also suggested.[43] Burning the site of the sting or putting hot olive oil and Zeft resin on the site have been stated as well. This kind of burning was common in ancient Egypt. This method for the treatment of stings has been known as one of the most effective ways in this regard.[16] Nowadays, in the countries separated from the former Soviet Union, burning the site of the sting by venomous animals such as the black spider by a piece of metal or burning matches is used as a way for treatment.[44] This old therapeutic method is still applicable in the areas with scorpions. For instance, in Ramhormoz in the province of Khuzestan, hot sands are used to burn the site of the sting.[2,17] Using this method, scorpion poison made of organic compounds and protein mostly is slightly burned along with the surrounding tissue. Cutaneous leishmaniasis is treated by the local healers in Abuzeidabad in Aran and Bidgol but scars remain because of burning. This method is very invasive and can jeopardize the patient's life if necessary therapeutic equipment cannot be used in emergencies.

In traditional Iranian sources, especially in the *Canon of Medicine*,[16] different medicines such as *Assa foetida* resin to neutralize the poison have been mentioned to treat scorpion sting and decrease complications especially the pain created. "Taking garlic after drinking some wine alleviates the pain. If garlic is taken with walnut and is followed with some wine, it is more effective in lessening the pain. After eating the garlic and drinking the wine, they should cover in a warm place so as to sweat. If the site is placed somewhere above a hot steam, it is better. The important point is sweating in order to drive the obscene material out of the body. If they go bathing and sweat there, of course it is good. It is preferable to drink pure wine after bathing. Oral drugs in the treatment of scorpion sting include bitter lettuce juice, desert chicory juice, beer, and whatever pacifying the temperature especially in the case of severe inflammation."[16] Elsewhere, colocynth is recommended for treatment.[45]

In another source, it has been mentioned that pennyroyal is diuretic. Therefore, it is prescribed for those stung by some venomous animal.[43] It has been stated that a mixture of garlic along with warm wine and bottle grass, angedan resin, *Anacyclus pyrethrum*, and *Opoponax galbanum* is outstandingly useful in treatment.[41] All drugs common in modern medicine owe debt to the traditional medicine common in some countries. Nowadays, researchers investigate through different countries, regions, and even tribes of Latin American and African Indians to get acquainted with usage of herbal medicines.

Iranian physicians should not neglect this matter. They do not even need to travel to other countries or regions. There is a concise and complete list of medicinal drugs in the Iranian traditional texts. Research into usage of these medicines is necessary in our country. Traditional medicine is now practiced in India, Pakistan, and Bangladesh especially among Muslims. Richness of traditional medicine in the Indian subcontinent is mostly due to the immigration of Iranian physicians in different centuries.[20] Of course, there are discussions about some of the drug cocktails that have been mingled with superstitions. Researchers need to distinguish between them.

3.5. To get rid of scorpions

To get rid of scorpions, different methods have been suggested in Iranian traditional medicine. In the *Canon of Medicine*,[16] it says that a scorpion dies if a radish leaf or a piece of lead is put on it. Mountain basil is a killer of scorpions. Provide *Styrax officinalis*, orpiment (arsenic natural sulfur), sheep droppings, and sheep fat in equal quantities; let the fat be melted and put in front of the scorpion's hole: the scorpion will leave the hole. If a slice of radish is put in front of scorpion's hole, it never dares come out of it. If smoke of a killed scorpion is directed towards a scorpion hole, the scorpion dies inside. Smoke of orpiment kills the scorpion.[16,46] Smoke of sulfur, orpiment, fat, and sheep droppings frighten scorpions.[41] Among cases advised in the traditional medicine texts, some are precisely effective in getting rid of or killing scorpions. Using smoke in the cases mentioned can keep the scorpions away. Smoke produced by burning different materials is today used for keeping

away arthropods from people, which is most common among rural populations. Orpiment or arsenic sulfur (As_2S_3) is an old poison used now for pests. Sulfur is also another old pesticide widely used for keeping arthropods away. This shows how vast and practical the science of Iran was long ago.

3.6. Colors and species of scorpions

Severity of poisoning depends on factors such as health status, age of victim, site of sting, scorpion species, size of scorpion, and degree of the scorpion's stimulation. Scorpion species is of vital importance because each species has different fractions and organic compounds in its poison, resulting in different mechanisms in the body of humans or animals. Each species has notable difference with other species in terms of appearance or color. Thus, color of scorpions conveys different species, which has been insisted on in the *Canon of Medicine*.[16] "Scorpions appear in nine different colors: white scorpion, yellow scorpion, gray scorpion, grayish black scorpion, green scorpion, golden scorpion in which tip of the tail and forks is black, vinaceous scorpion with needle-pricking sting and great pain, and dingy scorpion that its sting results in excess laughing and delirium."[16] In total, 52 species of scorpions have been identified in Iran, with a few subspecies for some.[47] All of the scorpions have various ecotypes for each climate, which include nearly all the colors described by Avicenna in the *Canon of Medicine*.[16] Of course, the young of scorpions have a milky or white color. Identification of scorpions and their morphology has received special attention in the traditional and ancient scientific sources of Iran. Avicenna mentions cases that are consistent with our findings today in this regard.

3.7. Morphology and sex differences (male and female) scorpion

Differences between male and female scorpions are given as follows: "male scorpion is skinny and slim, while the female one is big in size; sting of the male sex is thick and that of the female is thin. About scorpion sting, it has been mentioned that some scorpions have double stings which remain as two bites. Site of the bites is cold and the whole body is warm accompanied sometimes with cold sweat."[16]

Having two distinct stings in the telson is not morphologically matched with a specific species today. However, it may be rarely possible in different species as an innate abnormality. It is notable that there are two glands of poison in the telson that separately carry the poison to the back of the sting. Therefore, at the end of the sting, a unique duct of poison is formed containing poison of both glands.[2,17]

There is no flying scorpion among various species today and based on the sources available, no species of scorpions have ever been winged. However, in some old texts, flying scorpions have been mentioned. Also, according to laymen in regions rich in scorpions such as Kashan, flying scorpion has been reported. According to the *Canon of Medicine*,[16] flying scorpions are bigger than the usual ones and they use their wings to fly safely from one place to another.[16]

In the sand dunes of desert regions especially near Kashan, movement of black scorpion *A. crassicauda* has been watched in strong winds by the author. These scorpions in strong winds and storms move easily and safely from sand dunes due to their hard and firm exterior skeleton. When winds blow, a great deal of sand is brought to human residential sites. This matter is confirmed by lay observations in some regions of the country that scorpions are more common when the wind blows. Usually, these arachnids rest 10 cm or more deep under layers of sand to shelter from the severe heat of the desert.[2] Movement of hairy scorpions in the wind is easier.

The same source says that there are scorpions with a six-segment tail that becomes very dangerous and deadly when the Sheri star (after August 15) rises. There are also scorpions with tails made of fewer than six segments.[16] The first part about the tail has been explained well. In the morphology of scorpions, there are five metasomal segments with the telson at the end. By considering the telson as a separate segment, the ancient report about the tail and deadliness of scorpion in August comes true. However, the reports about scorpions with less than six-segment tails is not in reality believable.[2]

3.8. Misunderstandings about scorpion

There are fabulous sayings about the behavior of scorpions. One of them says that if a scorpion is surrounded by fire, the scorpion stings itself.[1] These beliefs about scorpions exist among Iranians and people of other nations. These statements by ordinary people originate from the observation that when a circle of fire with a noticeable height is made around the scorpion, the animal is invaded by the fire from all sides. Therefore, it tries to keep the fire away from itself with the only defensive tool it possesses—the sting. Then, it stings repeatedly different parts of its body to get rid of the fire burning the skin. Prior to being killed by its poison, organic materials and proteins in the scorpion's body are coagulated and denatured. If a human is surrounded by a circle of fire, no reaction is expected except for screaming and grabbing on the face until death. Nevertheless, if part of the body of an adult in particular is stung by an insect like a bee, we beat on the site immediately. Similarly, the scorpion touches itself as a defensive reaction. Therefore, it is not stinging itself, but it is trying to keep itself away from danger.[21]

4. Conclusion

Scorpion sting is one of the oldest health problems in Iran. Scorpions live in varied habitants such as indoors, outdoors, suburbs of villages and cities, and most regions of Iran.[48–50] Therefore, due to their contact with people, various cases of scorpion stings and mortalities have been reported in Iran in the ancient medical texts and after Islam. Thus, more studies and investigations in the Iranian traditional medicine can open new horizons in the treatment, control, and prevention of scorpion stings.

Scorpion sting and its venom have been regarded as a major medical and health problem, with a long history in Iran. By considering and scrutinizing the other side of these works, it can be claimed that dangers of scorpion, the beliefs, the realities, and analyzing customs has played a significant role in forming the role of this creature, which was occasionally realistic and in some cases mixed with superstitions.

Conflicts of interest

All authors declare no conflicts of interest.

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