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Scorpion stings in pregnant women: an analysis of 11 cases and review of literature

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Summary

Scorpion sting is one of the most important public health problem in many regions of the world. But there is not enough medical data about scorpion stings in pregnant women in the literature. The aim of this study was to describe the clinical findings and treatment modalities of scorpion stings in pregnant women. This study was performed in the Southeast Region of Turkey, retrospectively. Eleven pregnants were studied, totally. All of the patients were detected as class I according to the scorpion envenomization system. They were in different weeks of gestation. Local pain, hyperemia, swelling, and itching were the most frequent complaint in these cases. None of our patients received antivenom, and all of them were treated, symptomatically. Complication of pregnancy was observed in none of them.

Key words: Scorpion sting, pregnancy, treatment.

Introduction

Scorpions are arthropods of the arachnid class and they are one of the most important public health problems in many countries, especially Africa, South India, the Middle East, and South Latin America. Throughout the world, 3,250 deaths from scorpion stings occur per year. Therefore, the most of scorpion stings have local symptoms [1].

There are approximately 1,500 types of scorpions in the world but 50 types are dangerous for humans especially Buthus, Prabuthus, mesobuthus, Tityus, Androstonus, and Centruroides family of Buthidae. However *Androctonus Crassicauda, Leiurus quinquestriatus, Mesobuthus gibbosus,* and *Mesobuthus eupeus* are important types of scorpions in Turkey [2]. Different clinical presentations, from severe local skin reactions to neurologic, respiratory, and cardiovascular collapse are caused by scorpion stings. Simple local skin reactions can be treated with analgesics, antihistamines, and supportive care. However, severe systemic conditions must be treated with a multidisciplinary approach in intensive care unit.

The epidemiologic features of a patient who has been envenomed show a disposition in rural areas during the summer and the victims are generally adults. However envenomation is more dangerous in children. Several authors have reported the complications and epidemiology of scorpion stings in humans, but medical data about scorpion stings in pregnant women is not common in literature.

This study aimed to describe clinical characteristics and treatment modalities of scorpion envenomization in pregnant women.

Materials and Methods

This retrospective study was performed in the Obstetrics and Gynecology Department of the Adiyaman University between January 2010 and January 2013. Clinical and treatment data were obtained from medical records of the hospital. Initial evaluation and management were performed by the obstetric and gynecology staff. Laboratory investigations were performed in the emergency department. Clinical symptoms, vital signs, complications, and the period until the hospital after scorpion sting were recorded. The patients were classified depending on the severity of the symptoms. (Table 1) [3]. After being discharged, obstetric follow-up of patients were performed by clinicians. The delivery records were obtained by clinicians.

Results

Eleven pregnant women were studied, and their medical data records were analysed. Demographic characteristics, clinical stage, treatment modalities, and mode of delivery are shown in Table 2. Gestational age of patients were detected in ultrasonographic evaluation. Mean age and gestational age of patients 27.8 ± 4.9 (19-35), 23.4 ± 9.2 (10-35) respectively. The admission time was 8.4 ± 1.1 (0.5-36) hours after being stung.

There were no detected laboratory anomalies in all patients. Intravenous hydration, analgesic agent, and cold pack was applied in patient as a first treatment. The additional treatment was not needed for all of patients. The patients were discharged according to clinical severity in six to 24 hours. Patient's follow-up performed by clinicians. In delivery records, there were no observed abnormalities. Four patients had performed a cesarean section because of obstetric indications.

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Table 1. — *Clinical class of scorpion envenoming.*

Class	Symptoms
I	Local pain (sometime associated with local paresthesia, erythema, ecchymosis, blisters)
II	Mild systemic envenoming: Idem grade I + hyperthermia + cardiovascular and respiratory symptoms: tachycardia, arrhythmia, dyspnea, hypertension/hypotension, electrocardiographic abnormalities, priapism Hypersecretory syndrome (salivation, sweating, bronchorrhea, nausea, vomiting, diarrhea, urination) Digestive tract: abdominal distension, abdominal cramps Neuromuscular disorders: dysfunction of either skeletal or cranial muscles: confusion, agitation, fasciculation, dystonia, vision disorders, ptosis, aberrant eye movements Biological disorders: hyperleucocytosis, hyperglycemia, acidosis
III	Life-threatening envenoming: idem grade II + multivisceral failure Cardiovascular symptoms: heart failure, cardiogenic shock, pulmonary edema Diaphoresis Neuromuscular disorders: dysfunction of both skeletal and cranial muscles: convulsions, paralysis, Glasgow score #6 (in absence of sedation) Biological disorders: SaO_2, 90%, increasing biomarkers of cellular necrosis, electrolytic anomalies (decrease of Na+ and Ca++, increase of K+)

Table 2. — *Demographic characteristics, clinical stage, and treatment modalities of patients.*

Patient	Age	Gestational age	Sting site*	Admisson time after sting (hour)	Envenomation severity	Treatment
1	19	24	LE	6	Class I	Supportive
2	24	31	UE	24	Class I	Supportive
3	25	26	UE	36	Class I	Supportive
4	27	11	UE	2	Class I	Supportive
5	32	28	LE	3	Class I	Supportive
6	35	12	UE	6	Class I	Supportive
7	34	34	UE	1	Class I	Supportive
8	31	35	LE	0.5	Class I	Supportive
9	30	18	LE	5	Class I	Supportive
10	23	29	LE	3	Class I	Supportive
11	26	10	LE	6	Class I	Supportive

*: LE: Lower extremity; UE: Upper extremity.

Discussion

Scorpion venom is a water-soluble, antigenic, and heterogenous. It may contain multiple toxins and other compounds. This venom include neurotoxin, cardiotoxin, nephrotoxin, hemolytic toxin, phosphodiesterases, phospholipases, hyaluronidases, glycosaminoglycans, histamine, serotonin, tryptophane, and cytokine releasers. The signs and clinical symptoms depend on various factors (species of scorpion, amount of venom injected, place of sting, age and weight of victim, the period elapsed between the time of the sting and first medical aid). The most important toxin for clinical features is neurotoxin. This toxin effects voltage-dependent ion channels. Somatic and cranial nerve hyperactivity results from neuromuscular overactivity. As a result venom toxins alter these channels, leading to prolonged neuronal activity and many organ functions. Most deaths occur during the first 24 hours after sting. Cause of death is generally respiratory and cardiovascular failure [3].

Scorpion stings are the most important envenomizations in many parts of world. It is especially responsible for morbidity and mortality in pediatrics and elderly age groups. In babies or children, because of lower body weight, a larger ratio of venom to body weight leads to a more severe reaction. A mortality rate of untreated babies are very high. Mortality rate of untreated baby is 20 % of mortality rate in all age groups. Therefore, unborn baby is at the greatest risk for envenomization. This increased rate is caused by the delay in receiving medical assistance due to a longer travel time to medical centers and the lack of advanced medical treatment. However advances in public health education, social status, treatment modalities, and intensive care units have decreased mortality and morbidity from scorpion envenomization [4, 5].

Several studies have shown a varied age or medical status distribution for scorpion stings, but there is not enough study on scorpion sting in pregnant women. Scorpion envenomization during pregnancy is generally studied on pregnant rats. On the other hand, only case reports have been reported on pregnant women. The results of these studies have shown that scorpion stings are associated with miscarriage, preterm birth, and placental abruption [6]. Limited available literature suggests that adverse outcomes are primarily related to venom effects on the mother. In the literature, some types of scorpion venoms were tested on the isolated rat uterus and its effects were obtained. An amount of venom caused a contraction of the uterus [7]. The teratogenicity of the venom on fetus is unknown. The teratogenic effect of the venom appears to be the results of its metabolic effect and action on body electrolytes of the maternal animal, rather than to a direct effect on the fetuses [8]. On the other hand, the several studies in the animals observed that some types of scorpion venoms cause a high fetal resorption rate (especially during the 9-11 gestational age), vertebral and ossification defects, and fetal weight loss [8,9].

In this study, 11 pregnant women were evaluated retrospectively. All of patients clinical stage were defined as stage I including local pain, erythema, and local paresthesia. Gestational age of the patients distribution are shown in Table 2. When the present authors investigated the total number of cases, there was a difference in gesta-

tional weeks in stings. The treatment of patients were supportive. It include intravenous fluid administration of an analgesic agent. This study showed that scorpion stings are frequent during the summer months. This result is agreement with previous studies [10, 11].

Number of patients is not enough for suggestion of treatment modalities in pregnant women. Clinical presentation of patients depend on scorpion species. Hemoglobin, hematocrit, white blood cell, and biochemical problems according to excessive sweating, vomiting, and stimulation of autonomic nervous system have detected in advance stage of scorpion stings. Fortunately, this situation was not encountered in the present patients. Especially, hyperglycemia associated with inhibition of insulin secretion is important in pregnancy. Hyperglycemia might be responsible for fetal mortality or impaired neuronal development [8]. Scorpion envenomization treatments have no scientific basis. First medical aid and knowledge for patients is essential. The aim of the treatment of scorpion stings in pregnant women must be protection of women's health, because *if the pregnant women's health is good, the baby's health is also good.*

Conclusion

The present study showed that supportive treatment is enough in class I scorpion envenomization in pregnant women. Pregnancy related complications were not detected in this class. When the scorpion envenomization in pregnant women is in class II or class III, antivenom or additional treatment agents are used for women's health, since it is necessary for the health of babies. Because only class I patients were detected in this study, further studies are needed in the class II and III pregnant women with scorpion stings.

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