

## Study of snake Bite clinical signs , Complication and Management

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### الخلاصة :

دراسة وبائية أجريت على ضحايا لدغات الأفاعي السامة الراقدين في مستشفى الديوانية التعليمي للفترة من 2002-2005 . أتضح من تلك الدراسة ان 60 % من الضحايا من منطقة ال-بدير؛ 66.1% من المرضى يعانون من نزيف من مختلف مناطق الجسم. نسبة الوفيات للمرضى الراقدين 24.4% سنويا وتعتبر عالية جدا عند مقارنتها بالدول النامية والمتقدمة بسبب عدم توفر المصل المضاد ووحادات الدم والبلازما والراسب البارد.

### Summary:

**Background:** venomous snake bite represent an environmental health risk in Al- diwanyah districts.

**Objectives:** to find out the epidemiology, complications ,mortality due to venomous snakebites & the effectiveness of tranexamic acid in the treatment of coagulopathy caused by snakebites in the absence of specific antivenin.

**Patients & methods:** the study involved 65 victims of snakebite admitted to the medical ward in Al-diwanyia teaching hospital. Information were collected regarding age,sex,geographical origin areas affected, severity & complications including death .The effectiveness of tranexamic acid in the treatment of coagulopathy analyzed by Chi-square.

**Results:** 95.5% of victims lived in remote rural areas of Al-Diwaniah districts.66.1% had bleeding at time of admission. The annual mortality rate was 24.4%. Early fasciotomy seemed to worsen the prognosis. Tranexamic acid not reduced the mortality significantly in the group were used. No thrombotic events reported in both groups ( with & without tranexamic acid ).

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### Abstract:

Snakebite envenomation is worldwide problem. Venomous snakebite represents an environmental health risk in Al-Diwanyah districts. All reliable reports mention that the species of the snake is viper. Prospective interventional study done on cases of envenomation with poisonous snake bites to find the severity, complications and the outcome following different modalities of treatment. The snake bites victims admitted to medical ward, Al-diwanyia teaching hospital from January 2002- January 2005. 65 victims were included in this study (41 men, 24 women).

95.5% of victims lived in remote rural areas specially Ail-Badear (60%). 43 case had clinical features of coagulopathy at time of admission & all victims did not receive antivenin therapy. The mortality rate about 24.4%. It seems that tranexamic acid did not reduce the mortality significantly and not increased the incidence of thrombotic events in the group were used.

**Early fasciotomy seemed to worsen the prognosis.**

### Introduction:

Snakebite envenomation is a worldwide problem resulting in approximately 30,000 annual death (17). Over 3,000 species of snakes exist worldwide but only 10% of them are venomous (1,18). It should be pointed here, that the practice of classifying a venom as either haematoin & neurotoxins has proven to be flawed & insufficient in defining the true nature of snake venom & toxins (15). More than 20 enzymes have been detected in snake venom, and 12 are found in all venom (1,24). Snake venom enzymes are proteolytic & haemorrhagic toxins (24). Systemic bleeding due to consumption coagulopathy due to activation of procoagulants is the leading manifestation & cause of death in viper systemic envenoming (8,12). Doctors knew that some victims of snakebites bleed to death (21). Researches about snake venom has already led to several new drugs, one is aggrastat, (super-aspirin) that prevent blood clot. This compound grew directly of venom studies (25). Thrombotic occlusion of the blood vessels is very rare in cases of snakebite (7). The cornerstone of the treatment of snakebite envenomation is antivenin (5), which is not available in our hospital at the time of the study. The cornerstone of treatment of DIC remains to be the alleviation of the primary disorder (4). Without control, DIC will continue despite forms of therapy directed at correcting the bleeding or thrombotic problem (24). Patients with significant bleeding, replacement

therapy with fresh frozen plasma (FFP), cryoprecipitate, and/or platelet concentrates is helpful until the primary problem is controlled (22). Amniocaproic acid, Antifibrinolytics is useful in enhancing hemostasis when hyperfibrinolysis contributes to bleeding in life threatening bleeding & there are no evidences of thrombosis specially when other therapeutic modalities have been tried and deemed unsuccessful. (24).

### Materials & methods

Surveillance of all cases of snakebite was carried out between, January 2002 to January 2005 at medical department of Al-diwaneya teaching hospital.

Researcher completed specially designed reports on snakebite by direct supervision. Information on age, sex, geographic origin, area affected, severity and complications of envenomation. The effectiveness of tranexamic acid in reducing the mortality and inducing Thrombotic events was analyzed by the use of Chi- square. Tranexamic acid in a dose of 1gm IV 8q from the 2nd day of admission till the clinical & laboratory parameters of the bleeding settled had been used in 1st group versus the 2nd group were the drug not used). Comparison between both groups by assessing the following variables. (1) Number of whole blood units & fresh frozen plasma (FFP) required to settle the clinical and laboratory parameters of coagulopathy: bleeding from multiple sites i.e. skin, GIT, respiratory tree, urogenital system, retroperitoneal & CNS), APTT (control=25 sec) & Platelet count > 100,000/cmm, (2) Hospital stay (Patients were discharged when clinical and laboratory abnormalities settled) & (3) Death. Investigations included were CBC with differential count, APTT, renal function tests, sonography of abdomen and CT scan of the brain when indicated.

### Results:

In total 65 (41 men & 24 women), the mean age 13-55 year. The number of victims in last year of study (2004-2005) was 14(23%) with mortality rate 21.4%, the number of victims & the mortality rate for other 2 years of the study are shown in table 1.

**Table. 1: Annual number of the victims of snakebite &**

their mortality rate.

YEAR	Number of victims	%	Number of deaths	%
2004-2005	14	23%	3	21.4%
2003-2004	21	32.3%	6	28.5%
2002-2003	30	44.6%	7	23.3%

More than 95.5% of victims were resident in remote rural areas, 60% of them from Ail- Baedear. The remaining are shown in table 2.

**Table 2: Geographical distribution of 65 victims.**

The area	No of victims	% of total(65)
<b>Ail-Badear</b>	<b>39</b>	<b>60%</b>
<b>Al-Haphaar</b>	<b>13</b>	<b>20%</b>
<b>Al-Hamza Al Sharqy</b>	<b>3</b>	<b>4.6%</b>
<b>Al-Shanafyiah</b>	<b>3</b>	<b>4.6%</b>
<b>Noffar</b>	<b>2</b>	<b>3.1%</b>
<b>Effak</b>	<b>2</b>	<b>3.1%</b>
<b>Al-Noryiah</b>	<b>2</b>	<b>3.1%</b>
<b>Al-Shamyiah</b>	<b>1</b>	<b>1.5%</b>

Lower limb was the commonest of the bite (90%) especially foot & ankle. The commonest clinical feature at time of admission was Oedema (92.3%), other clinical features are shown in table 3 .

**Table3: Clinical features of 65 victims at time of admission.**

Clinical finding	No of victims	% of total(65)
Oedema	60	92.3%
Pain	50	76.9%
Bleeding	43	66%
Necrosis	15	23%
Restlessness	10	15.4%

The commonest complication was bleeding from different sites, which is seen in 43 case, other complications are shown in table 4.

**Table 4: Complications during hospitalization of 65 victims.**

The complication	No of victims	% (65)
Nil	22	33.8%
Bleeding	43	66.1%
Infection	18	27.6%
Death	16	24.6%
Compartment syndrome	14	21.5%
Renal dysfunction	2	3%

Bleeding at the site of the bite is recognized in 19 victims of the total 43 victims who had bleeding from multiple sites. Bleeding from other sites in both groups were shown in table 5.

**Table 5: The sites of bleeding in 43 victims divided into 2 groups. Group-1-with cyklokapron (20 victims) Group-2- without cyklokapron (23victims).**

of bleeding	(group1)	( 20 )	(group2)	( 23 )	( 65 )
At site of bite	19	95%	20	86.9%	90.6%
Cutaneous	15	75%	17	3.9%	74.4%
Gingival	12	60%	16	69.5%	65.1%
Urogenital	8	40%	11	47.8%	44.1%
Retro-peritoneal	5	25%	5	21.7%	23.2%
Respiratory	3	15%	5	21.7%	18.6%
Sub-dural	1	5%	0	0	0

Other complications include infection, compartment syndrome, renal dysfunction & death are compared between the 2 groups are seen in table 6 which revealed no significant reduction in mortality in group 1 when cyklokapron used ( $P > 0.001$ ) but no increased in thrombotic events.

**Table 6: Distribution of other complications between the 2 groups.**

The complication	No of victims ( group1 )	(%) (20)	No of victims ( group 2 )	(%) (23)	(%) (43)
<b>Infection</b>	<b>11</b>	<b>55%</b>	<b>13</b>	<b>56.2%</b>	<b>55.8%</b>
<b>Compartment syndrome</b>	<b>6</b>	<b>30%</b>	<b>8</b>	<b>34.7%</b>	<b>32.5%</b>
<b>Renal dysfunction</b>	<b>1</b>	<b>5%</b>	<b>1</b>	<b>4.3%</b>	<b>4.6%</b>
<b>Death</b>	<b>6</b>	<b>30%</b>	<b>11</b>	<b>47.8%</b>	<b>39.5%</b>

**Discussion:**

Snakebites is an important and serious medical problem in Al-diwanaya. However, reliable data for the morbidity and mortality are not available since there is no proper reporting system. This is the 1<sup>st</sup> study in adults to describe the incidence rate & mortality of venomous snakebites in Al-diwanaya but the size of the problem is still not fully appreciated.

The socio-cultural behavior & geographical features of Al-diwanaya districts expose its inhabitants to the risk of contact with viper snakes. Although the number of cases reported in the last year of study lesser than in the previous 2 years but the incidence & mortality rate still high, keeping in mind that children bitten by venomous snakes admitted to the pediatric hospital & some of mild cases admitted to the peripheral hospitals.

The annual death for those admitted to Al-diwanaya Hospital about 24.4%, which considered very high if compared to both developing & developed countries. The number of victims of snakebites in India is 100,000 annually, with 15000-20000 deaths annually (17%) (11). In Brazil, 20000 people bitten by venomous snakes annually with case fatality about 1.5% (4). In USA, about 8000-10000 victims bitten by venomous snakes annually, of which 15 case were fatal (0.16%) (3).

In Costa Rica, country with great variety of venomous snakes, snake bite nearly 700 people every year, with 10-15 death (1.7) (5).

The case fatality rate was 1.45% in Saudi Arabia (9). 87 deaths occurred among 722 snakebite admissions to the intensive care unit at Port Mosby General Hospital (PMGH), New Guinea within one year (14).

This high mortality definitely due to the absence of the specific antivenin mainly & partially to the delayed hospitalization & shortage of FFP & cryoprecipitate.

The high incidence of snake bite in Al-diwanaya (the total population 800,000 - 1million people) if compared to the sum of communities in

the previous countries mentioned above, most likely due to the absence of health educational programs regarding this important occupational risk. The educational program had been proven to reduce morbidity & mortality significantly as in Hail region, Suadia (9).

The higher rate in males can be explained by their increased outdoor exposure. Fasciotomy done at the 2<sup>nd</sup> day of admission for 2 patients worsen the condition of them, mostly due to severe secondary bacterial infection & eventually both died.

This worse sequels agreed with the most reliable studies (6,23), except one study done by M.L.AVILA-AGUERO & colloquies at (PMGH), Papue, New Guinea 1996 who claimed that early fasciotomy seemed to reduce the complications & hospitalization (14)

Other complications as renal dysfunction & infection had nearly similar incidences to the studies in developing, poor countries as in Pakistani study (16). The lower limb was the commonest site of bite (90%).

Systemic bleeding due to consumption coagulopathy & thrombocytopenia due to activation of procoagulants is the leading cause of death in viper systemic envenoming. 76% of patients with pit viper envenomations developed coagulopathy (2) compared to 66.1% in our study. Thrombotic occlusion of the blood vessels is rare & considered as case report as in study done by Dong-Zong Hung & colloquies, Taipei, Taiwan, 2002(12) and this agreed with our study.

Despite multiple whole blood & FFP transfusions, bleeding continue in all victims with absence of any thrombotic events. Tranexamic acid in adose 1gm 8q from the 2<sup>nd</sup> day of admission given to one group of patients (20 patients) had similar severity of bleeding (one case had subdural bleeding) to 2<sup>nd</sup> group. It seemed that this drug do not reduce the mortality significantly( may be due to limited number of patients in the study) and not inducing any thrombotic sequel . Hospital stay is the same in both groups (10±2) and the same numbers of FFP units (16±4) & whole blood used ( 6±2).

### **Recommendation:**

- 1- Preparation of specific antivenom
- 2- Education programs for people in areas with high incidence of snake bites.
- 3- The use of traexamic acid is safe .

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