Clinical Presentation and Outcome of Insect Bite in A Tertiary Care Hospital

Muhammed Raihan Chowdhury[1*] Mohammed Habibur Rahman[2] A S M Zahed[3]
Istiak Ahmad[4] Suman Das[5] Abu Syed Md Rashedul Hasan[6]
Aniruddha Ghose[7] M A Hassan Chowdhury[8]

Abstract

Background: Human contact with insects is unavoidable. Exposure to biting or stinging insects or their remains can range from benign or barely noticeable to life-threatening. The study aimed to explore the clinical presentation and outcome of the patients admitted to a tertiary-level hospital due to insect bites.

Materials and methods: This prospective observational study included 100 insect bite patients admitted to the Chittagong Medical College Hospital from July to December 2015. Data regarding socio-demographic profiles, types of insects, clinical profiles, complications, and in-hospital outcomes were collected using a structured case record form.

Results: The mean age of the patients was 37.3 (± 4.4) years (Range: 1.5 – 80 years) and 72% were male. Most of the patients (82%) were rural residents. Nearly three-quarters (73%) of biting or stinging incidents were caused by Hymenoptera (wasp, bee, and ant), followed by centipedes (23%). Redness (95%), swelling (83%) and itching (45%) were the common presenting features. Abnormal biochemical parameters were raised serum creatinine (5%), raised CPK (1%), moderate presenting anemia (1%), raised serum bilirubin (1%), increased prothrombin time (1%), and raised serum ALT (1%). The majority (95%) of the patients recovered uneventfully; only one patient died due to multi-organ failure.

Conclusion: Though recovery from insect bite was uneventful, few patients had acute kidney injury.

Key words: Allergy; Insect bite; Morbidity; Tertiary hospital.

1. Assistant Surgeon
BITID, Chattogram.
2. Assistant Professor of Medicine
Chittagong Medical College, Chattogram.
3. Associate Professor of Medicine
Chittagong Medical College, Chattogram.
4. Junior Consultant of Medicine
BITID, Chattogram.
5. Medical Officer of Medicine Outdoor
Chittagong Medical College Hospital, Chattogram.
6. Medical Officer
Upazilla Health Complex, Fatikchari, Chattogram.
7. Professor of Medicine
Chittagong Medical College, Chattogram.
8. Professor of Medicine (Retired)
Chittagong Medical College, Chattogram.

***Correspondence:** **Dr. Muhammed Raihan Chowdhury**
Cell : 01712 12 16 34
E-mail: raidr37cmc@gmail.com

Submitted on : 20.10.2022
Accepted on : 03.11.2022

Introduction

Insect stings by members of the Hymenoptera family have caused human deaths since the time of the Ancient Egyptians. The prevalence of insect sting allergy is estimated to be between 0.5 and 3%, and people who have previously experienced generalized allergic insect sting reactions are at increased risk for reactions from future stings. Effective management strategies using allergen immunotherapy can significantly reduce the risk of future anaphylactic responses and their associated morbidity and mortality.[1-3]

Admission to a tertiary care hospital for insect bite is not uncommon. The attending physicians must have a thorough knowledge of the clinical presentation and severe complications like acute kidney injury, rhabdomyolysis and hemolysis that may result from insects' biting or stinging. Recognition of insects and early intervention may reduce hospital stay and morbidity.[4] However, there were a scarcity of data and study regarding insect bite in our country. The present study analyzed the clinical presentation and in-hospital outcomes of insect bite cases admitted to a large tertiary hospital in Bangladesh. The data generated from this study might help formulate a local protocol for managing patients with insect bites.

Materials and methods

A prospective observational study was conducted in the Department of Medicine, Chittagong Medical College Hospital, Chattogram, from July 2015 to December 2015. Informed consent was obtained from the participants or the caregivers of the patients. Ethical approval was taken from the Ethical Review Committee of Chittagong Medical

College. Consecutively admitted patients of insect bites were included, irrespective of age and sex. Patients with unknown bites who did not provide written informed consent to participate in the study were excluded.

The patients were evaluated as per the predesigned case record form. The data included a detailed history, clinical examination, and investigations with particular references to the nature of insect bites, their identification, and clinical outcome during discharge.

Data processing and analysis were done using SPSS (Statistical Package for Social Sciences), version 17.

Results

During the study period, total 100 cases were found to meet eligible criteria and included in the final analysis. The mean age of them was 37.3 (± 4.4) years (Range:1.5-80 years). There were male preponderance (72%) and most of the patients came from rural area (Table I).

Table I Demographic characteristics of the patients (n=100)

Variables		Frequency (%)
Age	≤20 years	34 (34.0)
	20-40 years	31 (31.0)
	>40 years	35 (35.0)
Sex	Male	72 (72.0)
	Female	28 (28.0)
Residence	Rural	82 (82.0)
	Urban	18 (18.0)

The insects identified by the victims of the insect-bite were wasp (54%), honeybee (14%), centipede (23%), scorpion (2%), ant (5%) and others (2%) (Figure 1).

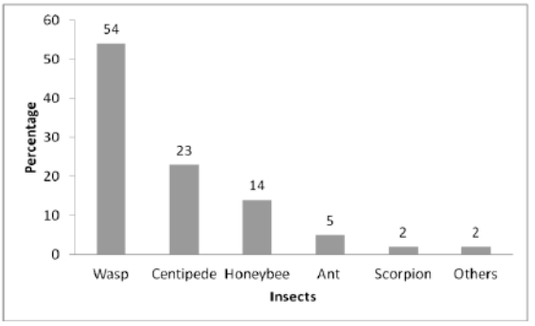

Figure 1 Relative frequencies of different types of insects identified in the study

In the present series, 15% of the patients reached the hospital within 2 hours of bite, 70% within 24 hours, 90% within 48 hours and rest of the patients within 7 days of bite. In 80% of the cases the bite was inflicted to limbs, followed by trunk (52%) head (42%), face (14%) and other sites (1%). One patient had low systolic and diastolic blood pressures (Below 90 and 60 Hgmm respectively) and two patients had rapid low volume pulse. One patient had moderate anaemia, 1 patient had raised serum bilirubin and raised serum ALT. Raised serum creatinine was found in 5 patients. Raised CPK (2416 IU/L) and increased prothrombin time (24 sec) each was found in 1 patient (Table II).

Table II Clinical profile of the patients admitted due to insect bite (n=100)

Variables	Frequency (%)
Time to reach hospital	
Within 2 hours	15 (15.0)
2-24 hours	55 (55.0)
24-48 hours	20 (20.0)
2-7 days	10 (10.0)
Site of bite	
Limb	80 (80.0)
Trunk	52 (52.0)
Head	42 (42.0)
Face	14 (14.0)
Others	1 (1.0)
Hemodynamic state	
Low (< 90) systolic BP (mmHg)	1 (1.0)
Low (< 60) diastolic BP (mmHg)	1 (1.0)
Pulse (Rapid, low-volume)	2 (2.0)
Biochemical abnormality	
Hemoglobin (< 8 g/dl)	1 (1.0)
Serum bilirubin (> 3 mg/dl)	1 (1.0)
Raised ALT (> 500 IU/L)	1 (1.0)
Raised s. creatinine (> 1.5 mg/dl)	5 (5.0)
Raised CPK (> 300 IU/L)	1 (1.0)
Raised prothrombin time (Sec)	1 (1.0)

The complications encountered following bite were classified into local and systemic. Different local manifestations of bite noted were redness (95%), swelling (83%), itching (45%), necrosis (31%) and cellulitis (1%). Of the systemic complications developed 4% were Acute Kidney Injury (AKI) and another 1% Multi Organ Dysfunction Syndrome (MODS) (Table III).

Table III In hospital complication and outcome of the admitted patients with insect bite

Variables	Frequency (%)
Local complications	
Local Redness	95 (95.0)
Swelling	83 (83.0)
Itching	45 (45.0)
Necrosis	31 (31.0)
Cellulitis	1 (1.0)
Systemic complications	
Acute kidney injury	4 (4.0)
multi organ dysfunction syndrome	1 (1.0)
Outcome of insect bite	
Recovered	95 (95.0)
Recovered with renal replacement therapy	4 (4.0)
Expired	1 (1.0)

Discussion

In the present study, common mode of presentation was redness and swelling. Different biochemical abnormalities like raised serum creatinine, raised CPK, moderate anemia, raised serum bilirubin, increased prothrombin time, raised serum ALT were observed in patients who were provisionally diagnosed as critically ill. Majority of the patients recovered uneventfully, only one patient died due to multi-organ failure. Out of the five patients with raised serum creatinine, four recovered with renal replacement therapy.

The main insect involved was wasp (54%) and the most common affected site was limbs. Wasp stings are quite commonly observed in Bangladesh though they are under reported.[5] A study done by Ghimire et al demonstrated that the main insect involved in the bite was wasp.[6] Wasp stings may result in a wide range of clinical presentations which can be lifethreatening if not diagnosed and treated in time. Localized pain, tissue necrosis and anaphylactic reactions followed by wasp sting are well recognized.[5] Apart from these, they can produce systemic reactions and organ dysfunction including rhabdomyolysis, hemolysis, thrombolysis, disseminated intravascular coagulation, acute tubular necrosis, acute kidney injury, centrilobular necrosis of liver, subendocardial necrosis and neurologic complications.[7-9] Complications like acute renal failure, intravascular hemolysis, rhabdomyolysis, impaired liver functions,massive gastrointestinal bleeding were reported by previous studies following insect bite.[7,10,11]

Limitation

As this is a hospital-based study, the findings cannot reflect the scenario of the whole community. Although our study was on insect-bite, some other classes Arachnida (Scorpion) and Myriapoda (Centipede) were included due to similar clinical presentations and outcome.

Conclusion

From the findings of the study, it can be concluded that wasp is primarily involved in biting or stinging incidence followed by centipede, bee, and ant. Majority of the victims of insect-bite come round from the condition uneventfully. Very few patients develop severe systemic complication require specialist's care. Occasionally patients may die due to acute renal failure.

Recommendation

Physicians should be made aware of the clinical presentation, management and complications of insect-bite and train them to better and up-to-date management of the insect-bite.

Acknowledgement

The authors acknowledged the support of nursing staff of the Medicine Unit of CMCH regarding the data collection.

Contribution of authors

MRC-Acquisition of data, data analysis, drafting & final approval.
MHR-Acquisition of data, drafting & final approval.
ASMZ-Data analysis, critical revision & final approval.
IA-Interpretation of data, drafting & final approval.
SD-Data analysis, drafting & final approval.
ASMRH-Interpretation of data, drafting & final approval.
AG-Conception, interpretation of data, critical revision & final approval.
MAHC-Design, critical revision & final approval.

Disclosure

The authors declared no conflicts of interest.

References

1. Moffitt JE. Allergic reactions to insect stings and bites. Southern medical journal. 2003;96(11):1073-1080.

2. Reisman RE. Insect stings. New England Journal of Medicine. 1994;331(8):523-527.

3. Kar S, Dongre A, Krishnan A, Godse S and Singh N. Epidemiological Study of Insect Bite Reactions from Central India. Indian J Dermatol 2013;58(5): 337–341.

4. Golden DB. Anaphylaxis to insect stings. Immunology and Allergy Clinics. 2015;35(2):287-302.

5. Thiruventhiran T, Goh BL, Leong CL, Cheah PL, Looi LM, Tan SY. Acute renal failure following multiple stings. Nephrol Dial Transplant. 1999;14(1):214-217.

6. Ghimire M, Pahari B, Paudel N, Das G, Sharna Sk, Das GC. Hymenoptera stings: A study of clinical profile, complications and outcome from a teaching hospital of central Nepal. Journal of College od Medical Science – Nepal. 2013;9(3):17-24.

7. Kim YO, Yoom SA, Kim KJ, Lee BO, Kim BS, Chang YS, et al. Severe rhabdomyolysis and acute renal failure due to multiple wasp stings. Nephrol Dial Transplant. 2003;18(6):1235.

8. Bhatta N, Singh R, Sharma S, Sinnha A, Raja S. Acute renal failure following multiple wasp stings. Pediatr Nephrol. 2005; 20(12):1809-1810.

9. Likittanasombut P, Witoonpanich R, Viranuvatti K. Encephalo-myeloradiculopathy associated with wasp sting. J Neurol Neurosurg Psychiatry. 2003;74(1):134-135.

10. Vikrant S, pandey D, Machhan P, Gupta D, Kaushal SS, Grover N. Wasp envenomation-induced acute renal failure: A report of three cases. Nephrology. 2005; 10:548–552.

11. Dhakal AK, Basnet NB, Shrestha D. Acute kidney injury due to multiple was stings in an eight-year-old child. J Kathmandu Medical College. 2013; 2(3):145-147.