Research & Reviews: Journal of Clinical and Medical Case Studies

Kinetics of Liver Markers in a Case of Bee Sting: A Case Report

S. Asmathulla*, Suganya Sribalaji, A.K. Badrinath, Rajarajeswari, Balakrishna Pai

Department of Biochemistry, Sri Manakula Vinayagar Medical College and Hospital, Puducherry, India

Case Report

Received: 24-Aug-2022, Manuscript No. JCMCS-22-73485; **Editor assigned:** 29-Aug-2022, Pre QC No. JCMCS-22-73485 (PQ); **Reviewed:** 12-Sep-2022, QC No. JCMCS-22-73485; **Revised:** 19-Sep-2022, Manuscript No. JCMCS-22-73485 (R); **Published:** 28-Sep-2022, DOI: 10.4172/J Clin Med Case Stud.7.6.001.

***For Correspondence:**
Dr. S. Asmathulla, Department of Biochemistry, Sri Manakula Vinayagar Medical College and Hospital, Puducherry, India

E-mail: asmath.ulla@rediffmail.com

Keywords: Liver markers; Bee sting; Haemodialysis; Rhabdomyolysis

ABSTRACT

A 50-year-old male came with complaints of bee sting with features of itching and burning sensation over the bite sites. Physical examination and laboratory results revealed presence of rhabdomyolysis, acute liver injury, and acute kidney injury and disseminated intravascular coagulation. Liver injury markers such as total bilirubin, Aspartate Aminotransferase (AST), Alanine Transaminase (ALT) started to rise from the day 1 upon reaching its peak on day 4 and returned back to normal on day 16. The patient started on antibiotics, steroids, glutathione, oral hypoglycaemic drugs and haemodialysis during the hospital stay and then the patient made a good recovery.

BACKGROUND

Bee sting patients are not common and some of the cases had been reported from the countries like Thailand, Vietnam. Bee sting, from the swarm of bees had resulted in the fatal complications such as Acute Liver Injury (ALI), Acute Kidney Injury (AKI), Disseminated Intravascular Coagulation (DIC), rhabdomyolysis, respiratory distress and ischemic stroke. The peptides and enzymes present in bee venom are found to be responsible for anaphylaxis and other complications. But the bee venom is therapeutically used for the management of Parkinson's disease, Alzheimer's disease, and amyotrophic lateral sclerosis. Bee venom contains a peptide melitin, a 26-residue peptide is the main constitute, along with phospholipase A2 is responsible for major complications [1,2]. There are 15 case studies of bee sting in literature out of which 11 studies have recorded acute liver injury. Upto our knowledge, none of these studies have recorded the kinetics of liver injury markers. We intend to discuss the kinetics of liver injury in a 55-year-old male following bee sting by swarm of bees.

CASE PRESENTATION

A 55-year-old male was brought with history of bee sting more than 50 bees. The patient complaints of severe pain and burning sensation over the bite sites. The patient was conscious and oriented. The patient complains of exhaustion, respiratory problems, and edoema in both the upper and lower limbs [3]. On Examination multiple bite sites associated with tenderness, redness, and swelling. On the day 2, patient developed bilateral upper and lower limb edema. As the patient had anuria and had increase in serum creatinine, and managed with hemodialysis in alternate days. Serum findings showed increase in total Creatine Kinase (CK), Lactate Dehydrogenase (LDH), total bilirubin, Aspartate Aminotransferase (AST), Alanine Transaminase (ALT), urea, creatinine, Prothrombin Time (PT) indicates rhabdomyolysis, Acute Injury (ALI), Acute Kidney Injury (AKI) and Disseminated Intravascular Coagulation (DIC). Patient was diagnosed to have diabetes mellitus during the course of hospital stay. The patient was managed with antibiotics, steroids, glutathione, oral hypoglycemic drugs. Bilateral upper and lower limb edema subsided by the end of 2nd week. Total bilirubin was found to rise since day 1, reaching its peak on day 3 and returned back normal on day 14 whereas Alanine Transaminase (ALT) and Aspartate Aminotransferase (AST) also found to rose from the day 1 but reached their peak on day 4, returning back normal on day 16.

Investigations

On the day of admission both blood and urine sample were sent for routine investigations. Mild increase in the level of total bilirubin, Alanine Transaminase (ALT) and Aspartate Aminotransferase (AST) were noticed. On follow up, the liver injury markers continued to raise. Serum total bilirubin peaked at day 3 and returned back normal on day 14. Serum ALT and AST levels peaked on day 4 and returned back normal on day 16. Serum levels of total Creatine Kinase (CK), Lactate Dehydrogenase (LDH) and potassium were elevated suggestive of rhabdomyolysis. Serum urea, creatinine, potassium and Prothrombin Time (PT) estimated on next day of the admission were found to rise consistently. There was decrease in serum bicarbonate level and serum haptoglobin level. Urine myoglobin was found to be negative. Ultra sound abdomen of the patient showed grade II medical renal disease.

Differential diagnosis

1. Bee sting injury
2. Acute kidney injury
3. Newly diagnosed Type 2 Diabetes Mellitus
4. Rhabdomyolysis

Treatment

The patient treated with antibiotics, steroids, glutathione, oral hypoglycaemic drugs and haemodialysis during the hospital stay.

Outcome and follow-Up

Patient was discharged and was on oral hypoglycaemic drugs and was on follow up for diabetes mellitus.

RESULTS AND DISCUSSION

Bee sting venom will lead to complications like liver injury, kidney injury, coagulation problems and anaphylactic reactions in addition to local reaction like cellulitis and edema. We present a case of bee sting injury that developed acute liver injury, rhabdomyolysis and acute kidney injury. Acute Liver Injury was evident as liver transaminases and serum bilirubin was elevated. Rhabdomyolysis was identified as creatine kinase and LDH were elevated. AKI was evident as the patient had anuria, elevated serum urea and creatinine for which he was managed with hemodialysis. Bee venom containing various toxins like melittin, apamin, mast cell degranulating peptide, adalopin,

phospholipase A2 and hyaluronidase. Among them, mellitin and phospholipase A2 are responsible for most of the complications seen in bee sting. Melitin forms stable pore in phospholipid bilayer which makes the membrane more permeable to relative larger molecule. On the other hand, phospholipase A2, a single polypeptide chain of 128 amino acid with four disulphide bridges cleave the bond of phospholipids at the water/lipid interface. A study done by Cuihong Xie, revealed that 30.1% of the cases of bee sting had acute liver injury, with 21% developed acute kidney injury and 22.5% developed coagulation disorder. In a case series done by Lim et al, out of 17 bee sting patients being observed, 9 patients showed increase in liver enzymes. In our case we observed the release kinetics of liver markers [4,5].

There was an increase in total bilirubin, AST, ALT from the day 1 and it has reached its peak by day 4 and returned back normal by day 16. Investigation revealed that Patient liver enzymes started to raise slowly from the day 1. Patient had started clinical jaundice from day 3. A study on release kinetics of liver markers done in patients who underwent apitherapy by Adel Nazmi Alqutub showed that the progressive jaundice was seen 3 weeks after apithearpy with elevation of liver enzymes and returned back normal by 8 weeks [6]. This difference in release of liver markers might be due to amount of bee venom inoculated in apitherapy and bee sting injury as a in apitherapy only few bees are used for envenomation and in a case of bee sting injury, huge bulk of bee will inoculate the venom. There are reports which had proved dose dependent damage to the organs (Figures 1-3).

Figure 1. Gradual decrease in total bilirubin (from day 2 it becomes normal by day 16).

Figure 2. Abrupt decrease in AST on day 4 and becomes normal by day 16.

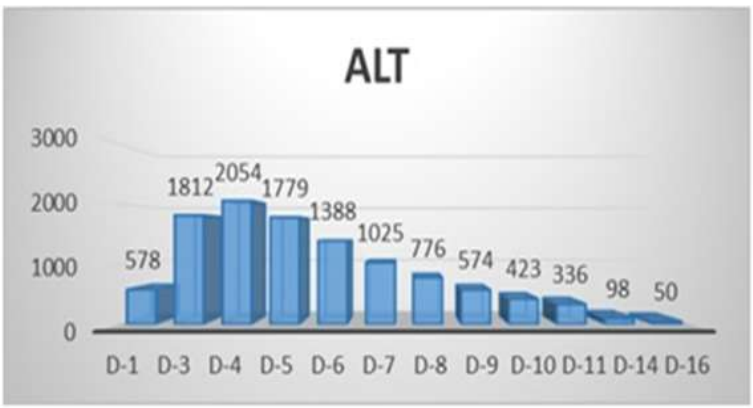
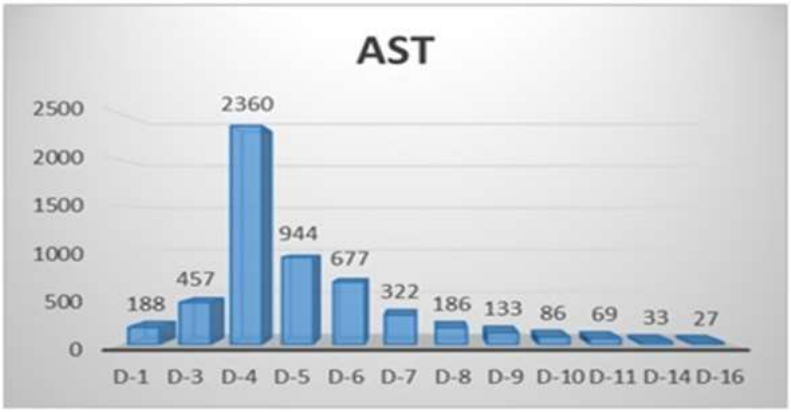


Figure 3. Gradual decrease in ALT and becomes normal on day 16.



CONCLUSION

Some of these tests assess how well the liver is doing its typical tasks, which include making protein and getting rid of the blood waste product bilirubin. Other tests for liver health examine the enzymes that the liver cells produce in response to injury or illness. Results of abnormal liver function tests do not always signify liver disease. Your results and what they represent will be explained by your doctor. Markers of liver cell injury raised from day 1 and become normal by end of 2nd week which may be mostly attributed by direct toxic injury bee venom compounds like mellitin and phospholipase A2. Amount of bee venom is directly proportional to complications. Effective and timely management of toxicity may safeguard the hepatocytes and reduce the morbidity.

REFERENCES

1. Wehbe R, et al. Bee venom: Overview of main compounds and bioactivities for therapeutic interests. Molecules. 2019;24:2997.
2. Xie C, et al. Clinical features of severe wasp sting patients with dominantly toxic reaction: Analysis of 1091 cases. PLoS ONE. 2013;8:e83164.
3. Venkataramanappa S, et al. An unusual case of bilateral empyema associated with bee sting. Case Rep Med. 2014;2014:1-2.
4. Alqutub A. Bee sting therapy-induced hepatotoxicity: A case report. World J Hepatol. 2011;3:268.
5. Lim P, et al. Elevated serum enzymes in patients with wasp/bee sting and their clinical significance. Clinica Chimica Acta. 1976;66:405-409.
6. Laxmegowda L, et al. Retrospective study on complications of bee sting in a tertiary care hospital. Int J. Contemp Med. 2018;5:1-3.