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Case Report: Thrombotic Thrombocytopenic Purpura Following Honeybee Envenomation: A Case Report

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ABSTRACT

Background: Thrombotic Thrombocytopenic Purpura (TTP) is a rare and life-threatening disorder characterized by severe thrombocytopenia, microangiopathic hemolytic anemia, fever, renal dysfunction, and neurological deficient. TTP leads to the formation of blood clots in small blood vessels throughout the body. TTP is associated with many risk factors such as pregnancy, HIV, cancer, lupus, and infections. Recently there have been few published case reports of bee sting associated TTP.

Methods: A 67-year-old man from a rural area of the Southwest Province of Iran, Ilam, was referred to the academic general hospital because of fever, chills, sweating, vomiting and dizziness following the honeybee sting on his body.

Results: this study showed that,multiple co-morbidities including CVD and diabetes, along with coagulation abnormalities after honeybee stings, seriously exacerbated patient hemodynamic status.

Conclusion: TTP, as a major complication due to the toxic reaction of a large number of bee stings with underlying diseases in patients, should be given more attention.

1. Introduction

Thrombotic Thrombocytopenic Purpura (TTP) is a rare blood disorder characterized by thrombocytopenia, microangiopathic hemolytic anemia, impaired neurological state, renal dysfunction, and fever [1]. Many different factors are associated with TTP, including drugs, infections, toxins, systemic lupus erythematosus, lymph proliferative disorders, hereditary thrombocytopenia, malignancy, and platelet aggregation disorders. Although the exact pathophysiology of TTP is still unclear, several lines of clinical and basic science observation suggest than the abnormal function of the von Willebrand factor is involved [1-3]. TTP is caused by severe ADAMTS13 activity deficiency and a lack of von Willebrand factor-cleaving protease. Disruption of ADAMTS13 activity leads to an accumulation of large uncleaved multimers of von Willebrand factor, which in turn causes inappropriate platelet aggregation and en-

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dothelial damage [4]. The consumption of platelets into these micro-thrombi causes severe thrombocytopenia, tissue ischemia, and organ dysfunction. This condition can commonly involve the brain, heart, and kidney, and potentially resulting in acute thrombolytic events such as stroke, myocardial infarction, venous thrombosis, and early death [5]. We report a case of a 67-year-old man who presented to the emergency department with TTP after the bee sting.

2. Case Presentation

A 67-year-old man living in a rural area of Ilam province, Iran presented to the emergency department of a governmental teaching hospital with 2 days history of vomiting, fever, chills, sweats, and dizziness. The patient had a history of eating mushroom 10 days earlier. He also revealed a history of more than 20 honeybee stings 3 days ago. The medical history revealed that he had type 2 diabetes, hypertension, and myocardial infarction. The patient had ventricular aneurysm confirmed by angiography. He underwent open-heart surgery in 2010. Subsequently, oral warfarin therapy was started.

On admission, the patient was awake and alert but unable to communicate properly. The patient had a fever, chills, sweats, nausea with projectile vomiting, dysarthria, conjugate gaze palsy, and rhythmic movements of the hands. The patient was treated with ondansetron 2 mg/dL intravenously.

On physical examination, his vital signs were BP=160/11 mm Hg, PR=78 beats/m, RR= 17 breaths/m, T=37.5°C, SpO2=95% in room air. Table 1 presents the first results of the blood and urine sample. Laboratory tests revealed severe thrombocytopenia (<46000), a significant increase in BUN (83 mg/dL), Cr (2.01 mg/dL), and BS (153 mg/dL). The tissue and organ damage resulting from the ischemia leads to increased levels of lactate dehydrogenase (LDH=2255 U/L) and creatinine. Elevated levels of creatinine are usually an indication of renal involvement. The hemoglobin level was normal at 13.4 mg/dL. The chest x-ray and thoracic CT scan findings were normal. Echocardiographic examination indicated low ejection fraction (EF~25%-30%) with mild to moderate mitral valve regurgitation.

The patient was admitted to the neurology service. He was also evaluated by physicians from the departments of general internal medicine, cardiology, infectious diseases, nephrology, pathology, and hematology. The doctors decided to immediately transfer him to the adult Intensive Care Unit (ICU). The patient was treated with clindamycin, 600 mg three times daily, and ceftriaxone 1 g two times daily. The patient experience loss of consciousness 24 hours after admission to ICU, so endotracheal

Table 1. Biochemical tests of the patient with thrombotic thrombocytopenic purpura

Laboratory Result	Normal Range	Result
BS	70-115 mg/dL	153 mg/dL
BUN	15-45 mg/dL	83 mg/dL
Cr	0.8-1.5 mg/dL	2.01 mg/dL
Bilirubin. Total	0.3-1.2 mg/dL	3.96 mg/dL
LDH	230-460 U/L	2255U/L
HB	12-17 g/dL	13.4 g/dL
HCT	36%-53%	39.7%
WBC	4000-10000 UI	13500 UI
PLT	150.000-450.000 UI	46000 UI
PT	11-13.5 s	21 s
PTT	60-70 s	30 s
INR	0.8-1.1	2.2
Na	135-145	142
K	3.5-5.5	4.5
CK-MB	0-25 UI/I	33 UI/I
Troponin	-	Negative
UA/RBC	-	10-12

intubation and mechanical ventilation were initiated. His pH level decreased (pH=6.88), and serum creatinine increased further in the first 24 hours of ICU stay.

The clinical findings in the presence of a significant decrease in the platelet count (23000) led the physician to the diagnosis of TTP. The patient required fresh frozen plasma (FFP) transfusion due to decreased platelet count with increased LDH. A left subclavian catheter was inserted, and the patient was dialyzed without heparin. The patient developed severe prolonged hypotension (systolic BP< 80 mm Hg) during the plasmapheresis and required a temporary stoppage of the exchange and administration of FFP. Hypotension was treated with feet elevation and intravenous norepinephrine. Because the patient's clinical state immediately deteriorate, he was observed closely. The continuing consumption of platelets and coagulation factors may cause severe tissue damage commonly involving heart and kidney, resulting in acute myocardial infarction and death. After the second hospital day, he developed cardiopulmonary arrest and died.

3. Discussion

Moschcowitz initially described TTP in 1924 [6]. It is characterized by increased microvascular platelet clumping resulting in thrombocytopenia and microangiopathic hemolytic anemia [1]. TTP is often accompanied by multiple organ dysfunction, renal failure, neurological abnormalities, and fever [7]. A large variety of unusual reactions and clinical manifestations have been reported following hymenoptera stings, including serum sickness neurological disorders, delayed hypersensitivity reaction 1, and renal disease [8]. To date, few cases of TTP after honeybee sting have been reported. Our patient experienced serum sickness without clinical evidence of TTP that occurred after a honeybee sting. Serum sickness occurs within 3 days to 2 weeks after envenomation. This condition can induce the formation of circulating immune complexes, which in turn lead to TTP and disseminated intravascular coagulation. TTP is a rare secondary complication that may occur after massive envenomation from honeybees. The specific sign of honeybee envenomation appeared to be related to the number of bee stings and patient inflammatory responses [9, 10].

A significant decrease in platelet count, together with elevated LDH levels, is an indicator of poor survival [5]. Besides, elderly patients with multiple comorbidities are more likely to develop severe complications [9]. This is unique among other reported cases where the patient was elderly with multiple comorbidities. Since older people commonly have multiple comorbidities, knowledge about which conditions contribute to an increased risk of tissue injury would be valuable. The patient had a history of open-heart surgery, hypertension, and type 2 diabetes. Fluctuation in blood pressure in the setting of diabetes and cardiovascular disease appear to worsen the side effects of honeybee envenomation. Our patient had a history of more than 20 honeybee stings 3 days ago.

Among the various causes of acquired TTP, honeybee envenomation is rarely reported. We present a 67-year-old man with TTP following honeybee envenomation. He developed signs of TTP, including fever, low platelet, increased LDH levels, impaired neurological state, and renal function. Advanced effects include a further decrease in platelet count and renal function. About 24 hours after hospitalization, the patient developed severe hypotension with acidosis. Severe hypotension leads to a temporary stoppage of FFP administration. After the second hospital day, unfortunately, our patient developed cardiopulmonary arrest and died. The continuing consumption of platelets and coagulation factors resulted in cardiopulmonary arrest and death. We are presenting this case to raise awareness about TTP following honeybee sting as it would have significant implications on mortality, treatment, and clinical courses.

4. Conclusion

For successful TTP treatment, raising awareness about disease treatment, prevention, and control in high-risk patients is essential. We presented a rare case to increase awareness among physicians as they consider TTP as a differential diagnosis following bee envenomation. Accurate treatment of TTP following honeybee sting has a significant impact on planning the optimal primary treatment modality.

Ethical Considerations

Compliance with ethical guidelines

The study protocol was in conformity with the ethical guidelines of the 1975 Declaration of Helsinki, revised in 1983. Private information, including name and surname was removed from the data sheet to comply with ethical concerns.

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Author's contributions

All authors contributed in preparing this article.

Conflict of interest

The authors declared no conflict of interest.

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