

Acute ischaemic stroke as a rare complication of multiple wasp bites

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Sri Lanka Journal of Neurology, 2020, 7, 20-21

Abstract

Wasp bite can give rise to variety of clinical symptoms from local reactions to systemic effects such as anaphylaxis and vascular thrombosis. Neurological manifestations like strokes are rare in wasp bites. Pathophysiology of vascular involvement following wasp bite is yet not well known but presumed to be multifactorial.

A 40-year-old previously healthy woman presented with multiple wasp bites on face. On admission she was stable without any haemodynamic instability or neurological deficit. Next day she developed a left temporoparietal infarction. Screening for other contributory factors were negative.

Introduction

Wasp bites are common encounters in general medical wards in especially in rural areas of Sri Lanka¹. Wasps are categorised under the insect order Hymenoptera which comes under phylum Arthropoda. They are the third largest of all insect orders and useful as pollinators of wild and cultivated flowering plants². Wasp sting though a minor injury may lead to serious medical complications. It can vary from simple local reactions to life threatening systemic complications including anaphylaxis and arterial thrombosis. Vascular thrombosis is a rare manifestation of wasp venom and only few cases have been reported in the literature³. The pathophysiology of vascular thrombosis may include vasoactive inflammatory and thrombogenic properties of venom as well as vasospasm caused by the venom.

Case report

A 40-year-old previously healthy woman from Anuradhapura, Sri Lanka presented to accident and emergency department with multiple wasp bites on face. She was haemodynamically stable and clinical examination was unremarkable other than facial swelling secondary to wasp bites. She was later transferred to

general medical ward for observation. Following morning, she was found to be confused. Neurological examination revealed left-right disorientation with hemi sensory and visual neglect. Her cranial nerves, motor examination of the limbs, and other system examination were normal. Urgent non contrast CT scan of the brain revealed an infarction in left temporo-parietal region. Her blood pressure, pulse rate, respiratory rate and oxygen saturation were within normal limits. She was started on antiplatelet drugs and statins.

Her full blood count, blood picture, liver and renal function tests, fasting blood sugar, lipid profile, electrocardiogram, transthoracic echocardiogram and transoesophageal echocardiogram with bubble contrast to exclude right to left shunts, carotid doppler, 24-hour Holter monitoring were normal. Thrombophilia screening tests including diluted russel viper venom test, kaolin clotting time, anticardiolipin antibodies, anti-beta-2 glycoprotein I antibodies, genetic thrombophilia screening tests (Factor V Leiden, Prothrombin 20210G>A, MTHFR 677C>T), Ham's test, serum homocysteine level did not reveal any abnormality. A CT angiogram of brain and neck vessels which was done on the third day of stroke was normal. She made a marked recovery in three months with mild deficits in episodic memory on cognitive assessment.



Figure 1. Axial image of non-contrast CT scan of the brain showing infarction in left temporo-parietal region.

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With the temporal association of events in this previously healthy woman without other risk factors for ischaemic stroke, it was concluded that the stroke was associated with the wasp bites.

Discussion

Wasp bites commonly cause simple allergic reactions whereas systemic complications including arterial thrombosis and anaphylaxis are rare^{1,6}. Other reported systemic complications of wasp bite include myasthenia gravis, peripheral neuritis, Guillain-Barré syndrome, diffuse alveolar haemorrhage, acute renal failure, thrombocytopenic purpura and vasculitis⁴.

Wasp venom contains mainly three categories of compounds.

- A) High molecular weight proteins including phospholipases, hyaluronidase and antigen V. These molecules even in smaller amounts can cause allergic reactions and anaphylaxis.
- B) Low-molecular-weight peptides including mastoparans, wasp kinin and chemotactic peptides which should present in larger quantities to cause complications such as anaphylaxis and other forms of systemic reactions.
- C) Bioactive molecules including histamine, serotonin, catecholamines, acetylcholine and tyramine which cause vascular spasm, vascular inflammation and thrombosis².

Left middle cerebral artery territory infarction following multiple wasp bites⁵, left cerebral infarction following three wasp bites⁶ and cerebellar haemorrhagic infarction following multiple bee stings⁷ have been reported. Few reports are available from Sri Lanka of cortical infarcts following multiple wasp and bee sting bites^{8,9}. In our case we presume ischaemic stroke was potentiated by multiple wasp bites.

Exact pathophysiology of wasp venom induced arterial thrombosis is yet to be described. It may be multifactorial. Ischaemia due to hypotension following anaphylaxis is a possibility though we did not observe this in our case. Leukotrienes and thromboxane in venom can cause platelet aggregation and thrombosis whereas phospholipases trigger an IgE mediated reaction cascade leading to mast cell activation and synthesis of number of inflammatory mediators. Direct toxic effect of wasp

venom compounds and vascular inflammation may also play a role⁸. Vasospasm and blood cell aggregation followed by thrombosis is another possible mechanism⁹. It is most likely that cerebral infarction in this patient was a result of combined effects of above mentioned mechanisms.

Conclusion

Physicians in rural medical practice encounter large number of wasp bites. Stroke is a rare but serious complication of hymenoptera envenomation. Awareness of these complications may prevent unnecessary investigations and delays in treatment.

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