

Tropical diabetic hand syndrome: prevention through education

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Abstract

Tropical diabetic hand syndrome describes an acute symptom complex found in patients with diabetes in the tropics, usually following minor trauma to the hand. Two different patients, both previously diagnosed with diabetes, suddenly developed an abscess of the hand that progressively worsened, and became an ulcer that was difficult, to manage at the referring private hospitals. The hands and lives of both patients were saved. The frequency of these cases appears to be increasing. Aggressive glycaemic control is a vital control measure for upper limb sepsis. Education remains the most important preventive tool in underdeveloped countries, and should remain an integral part of prevention.

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Introduction

“Tropical diabetic hand syndrome” (TDHS) is a term used to describe a specific acute symptom complex found in patients with diabetes in the tropics, usually following minor trauma to the hand, and is associated with a progressive synergistic form of gangrene.¹ The syndrome features a localised fulminant hand sepsis, which is potentially fatal. It is important to distinguish TDHS from diabetic hand syndrome, which consists of joint limitation and thickened skin on the hand.² Usually in TDHS, there is a preceding trauma, which might be quite trivial. Presentation to the hospital is often delayed as the patient is unaware of the potential risks, or because of poverty and ignorance, he or she initially decides to seek help from local healers.

Case studies

Case 1

A 45-year-old farmer presented with a four-week history of swelling of the left hand. Six weeks earlier, it had started with pain, and an abscess of the nail bed of the left fourth finger. There was no history of trauma to the hand. She applied herbs topically, and bought an oral antibiotic from a patent medicine store. The abscess ruptured spontaneously after a week, and the resultant ulcer continued to spread, until she lost all the skin and muscles of the distal phalanx of the affected finger. She went to a private hospital, and the distal phalanx was amputated. Three days after the amputation, there was progressive swelling, from the site of amputation, up to the elbow joint. The entire forearm was erythematous, and there was

a foul-smelling purulent discharge emanating from the palm and dorsum of the affected limb. She continued to apply herbs, but when the symptoms worsened, presented at Irrua Specialist Teaching Hospital. There was no history of previous limb ulcers, paraesthesia or fever, and all other systems were essentially normal. Two years before presentation, she was diagnosed with diabetes. Compliance with the prescribed insulin regimen was poor. She did not smoke or drink alcohol. On presentation, she was in pain, pale, and dehydrated. There was an ulcer on the palm and dorsum of the left hand, with gangrene of the fifth finger, and loss of the distal phalanx of the fourth finger. Desquamation and swelling from the wrist to the elbow was also noted. All other limbs were grossly intact. Pulse rate was 90 beats/minute, while blood pressure was 100/50 mmHg. Upon presentation, blood glucose was 238 mg/dl (13.2 mmol/l). All other systems were grossly normal. A diagnosis of left diabetic hand ulcer was made, and she was managed accordingly with fluids, insulin, wound debridement and dressing, prescribed an appropriate antibiotic based on the wound swab sensitivity, and given an analgesic. She was eventually discharged 49 days after admission with a fasting blood glucose of 104 mg/dl (5.8 mmol/l), and a completely healed left hand.

Case 2

A 40-year-old teacher was referred from a private hospital. She had an ulcer of three weeks' duration on the right hand. Before presentation, it had started as an abscess on the right thumb. The abscess ruptured spontaneously and developed into an ulcer affecting the palmar aspect of the right hand, with associated

swelling of the forearm. There was no history of trauma, but there was a history of numbness, reduced sensation in both hands and feet, and blurred vision. The patient was diagnosed with diabetes six years prior, and was taking glibenclamide and metformin. She didn't smoke or drink alcohol. She looked acutely ill and was pale, dehydrated, and febrile (temperature 37.6°C). The right hand had an ulcer on the palmar aspect. The right forearm was tender, hyperaemic and oedematous. The other limbs were grossly normal. The pulse rate was 116 beats/minute, and blood pressure, 100/60 mmHg. Sensation was diminished in both upper and lower extremities. Upon presentation, random blood glucose was 175 mg/dl (9.7 mmol/l). Following treatment, she displayed good wound healing, complete with the formation of healthy granulation tissue. She was discharged 37 days after admission with a fasting blood glucose of 99 mg/dl (5.5 mmol/l).

Discussion

TDHS is less well recognised than foot infections, and encompasses localised cellulitis with variable swelling and ulceration of the hands that develops into progressive, fulminant hand sepsis.¹ The consequences of TDHS are severe, and include permanent disability and death.^{3,4} Once infection is established, a vicious cycle is established, and areas immediately surrounding the infection becomes oedematous. The small vessels within the infected area are prone to thrombosis and occlusion. This is as a result of sluggish flow, due to platelet and leukocyte adhesion to the vessel walls. These two factors may combine to produce localised tissue ischaemia, and even gangrene.⁵ It is imperative to distinguish TDHS from the traditionally described diabetic hand syndrome, which consists of joint limitation (the inability to fully extend a finger), and thickened skin of the hand, especially involving the dorsum of the finger.² "Diabetic hand syndrome" is a term that is used collectively to describe collagen diseases of the skin and soft tissues of the hand in diabetics; which is the domain of the rheumatologist.⁵

The prevalence of TDHS in Nigeria ranges from 1.6-3.2%.^{6,7} While peripheral vascular disease and peripheral neuropathy are well-known risk factors for diabetic foot ulcer and foot infections, neither appears to play a substantial role in the pathogenesis of TDHS.⁹ In many cases, there has been a preceding trauma which might be quite trivial, e.g. an insect bite or a scratch, and presentation to the hospital is often delayed. This is often because the patient is unaware of the potential risks, or has decided to seek help from local healers initially, as a result of poverty and ignorance.⁹

Appropriate treatment for the majority of patients includes incision and drainage of the wound, debridement, or amputation. The surgical incision must extend along the entire area of erythema and induration, because the infection is often more extensive than suspected initially.¹⁰ *Staphylococcus aureus* is the most common organism that is isolated in diabetic hand ulcers, probably because *S. aureus* are common skin flora, and therefore could contaminate skin ulcers.¹¹ Culture of tissue biopsy specimens yields a single bacterial

species in > 75% of cases, whereas swab cultures usually yield polymicrobial flora, probably because of contamination.⁸ However, broad-spectrum antimicrobial therapy is necessary because of the development of polymicrobial gangrene. Glycaemic control and management of other co-morbidities, such as hypertension, should be optimal.

The frequency of TDHS appears to be increasing among diabetes patients in Africa. Generally, the effects of demographic, socio-economic, and behavioural factors on TDHS occurrence remain unknown. The prevention of TDHS-associated morbidity and mortality requires locale-specific inquiry and intervention. Aggressive glycaemic control is a vital control measure for upper limb sepsis. Education, still the most important preventive tool in underdeveloped countries, should remain an integral part of prevention, and it should be simple, repetitive, and target both healthcare providers and patients. Diabetes patients should be educated on how to care for their hands properly, and the importance of consulting a doctor or presenting to a clinic immediately at the onset of hand symptoms. Simple care, motivation, education and action by diabetes patients and health workers is essential in protecting their hands from infection, as diabetes is becoming more prevalent worldwide, and especially so in resource-poor tropical countries.

Conclusion

Education is the key to preventing diabetes complications, as well as preventing them from developing further. It should be simple, repetitive, and target both healthcare providers and patients. Diabetes patients should be taught how to take care of their hands properly, and the importance of consulting a doctor or presenting to a clinic immediately after the onset of hand symptoms. Motivation, education, and action by diabetes patients and healthworkers is essential to protect patients' hands from infection. As diabetes becomes more prevalent, especially in resource-poor tropical countries, efforts need to be increased to prevent and manage diabetes complications.

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