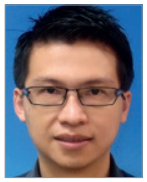
Upper limb infections with amputation in patients with diabetes



Diabetes mellitus is a global health problem and a major public health concern in Malaysia as it contributes to high mortality and morbidity rates. According to International Diabetes Federation (IDF) data in 2017, the prevalence of people with known diabetes in Malaysia was 3,492,600 (IDF, 2017). Based on Disability Adjusted Life Years (DALYs) measure, diabetes mellitus was one of the top 10 for total burden of disease in Malaysia. The Malaysian National Health Morbidity Survey III (NHMS III) conducted in 2006 showed that amputees formed 4.3% of the patients with known diabetes (Letchuman, 2010). However, the more common amputations were lower limbs. There are no statistics in Malaysia regarding upper limb amputations in patients with diabetes. Thus, this study was conducted to highlight the increasing rate of upper limb amputations among patients with diabetes at Hospital Teluk Intan.

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This cross-sectional study was carried out by reviewing the records of patients who had undergone upper limb amputation at Hospital Teluk Intan during a 1-year period from December 2016 to December 2017. The information recorded includes demographical data, diagnosis, comorbidities, sepsis and amputation level.

Out of 63 patients, 10 patients, who had undergone non-traumatic upper limb amputation during the 1-year period, had underlying diabetes mellitus and developed sepsis and upper limb infection. Seven patients required minor amputation (70%) and 3 patients undergone major upper limb amputation (30%) *[Figure 1]*. Seven patients, out of 10, were male (70%) and 3 were female (30%).

All of the patients had underlying diabetes mellitus (100%), 4 patients had hypertension (40%), and 3 patients had chronic kidney disease (30%). The age group with the highest amputation number was those aged 60—69 years (40%), followed by those between 50—59 years old (30%) *[Table 1]*. Two (20%) of the patients sought treatment after 1 month duration of symptoms and 8 (80%) of patients sought treatment within 1 month of symptoms. Necrotizing fasciitis and wet gangrene of upper extremities were the most common complications with a similar percentage (both 30%) of the cause for amputation. The upper limb infections of all patients with diabetes progressed from distal to proximal (farthest away to closest to the heart).

Discussion

An alarming incidence of upper limb amputations was recorded between December 2016 to December 2017 in Hospital Teluk Intan. Records showed that 30% of upper limb infections in patients with diabetes resulted in major upper limb amputations and 70% in minor upper limb amputation. There are only a few studies that discuss amputations involving upper limb infections and its increased risk of mortality. Most of the studies conducted at other centers focus on amputation rates of the lower limb in patients with diabetes and traumatic upper limb amputation only (Esquenazie, 2014). The hand infections in this study were not caused by trauma.

Hand ulcers are a rare complication of diabetes and it is thought that a long duration of the condition, poor metabolic control, age and peripheral neuropathy may play an important role in it (Wang et al, 2010). The presence of diabetes mellitus increases the risk of infection and sepsis and causes a higher rate of amputation (Koh et al, 2012).

The mortality rate of patients with diabetes who developed an upper limb infection and required amputation during the period of study was 10%. However, there were no comparative data available for patients with upper limb

Figure 1. Percentage of minor and major amputation according to gender

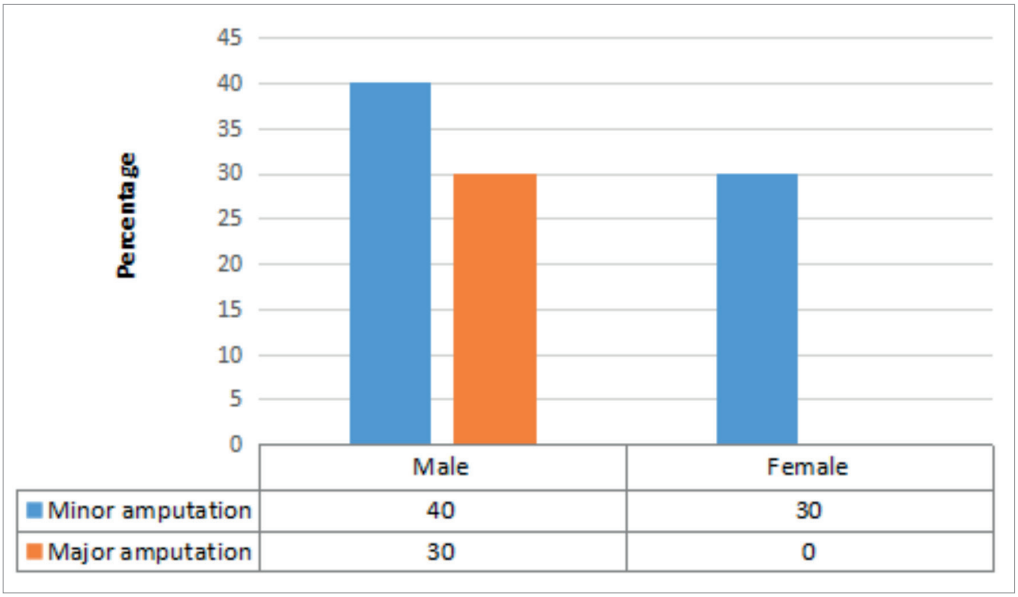

Table 1. Number of patients with amputation

	Age group (years)	Number of patients amputated
1	20–29	1
2	30–39	0
3	40–49	1
4	50–59	3
5	60–69	4
6	>70	1

infections in the same region. In this study, 50% of the patients had undergone minor amputation of the lower limb. Those patients who underwent amputation had long-standing uncontrolled diabetes mellitus, resulting in microvascular complications, infections or/and neuropathy.

Elderly patients are at a higher risk of infections and amputation due to their age, a greater lack in education on how to manage their diabetes and poorer compliance to diet, excercise and drug therapy. Mortality also increases with the severity of infection (Destarac and Ely, 2002). Thus, early treatment, including surgical intervention and the prescription of antibiotics, should be delivered to reduce the mortality and morbidity rate in this patient group.

Conclusion

Diabetic hand infection is a rare complication in patients with diabetes. A long duration of the condition, poor metabolic control, age, and diabetic peripheral neuropathy may play an important role in the pathogenesis of upper limb infection and may determine the progress and outcome of the condition in patients with diabetes. Untreated or inadequately treated cases can lead to marked morbidity and the mortality rate for patients with diabetes who had developed an upper limb infection in this study was measured at 10%. WAS

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