Case Report

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Diabetic Foot Ulcer: An Ayurvedic Approach for Prevention and Treatment

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ABSTRACT

Diabetes mellitus is an important metabolic disorder that has impacted the population globally. Various impediments are there affecting people with diabetes but more devastating is diabetic foot ulcer. Shortage of trained healthcare providers, lack of knowledge, delay in seeking foot care and barefoot walking are common factors that adds up to the burden of foot disease. A 72 years old female patient diagnosed with type-2 diabetes mellitus 8 years ago, accompanied by cellulitis which results in septic foot. The patient was on allopathic treatment and suggested for amputation. As the patient approached for ayurvedic treatment in July 2021, Diabban powder and Capsule, Capsule Anergex, Basant Kusumakar Ras, Hy-cure, Panchtikta Ghrit Guggal, Raktapachak, Fresh Moring was given. Various other changes such as replacing wheat flour with Pearl millet flour, Barley flour and Sorghum flour in diet was recommended. By the end of November 2021, the patient healed, wound disappear completely and was able to walk without any support. Among diabetic complications, the foot ulcers are consider the most preventable ones, however, poor practices and knowledge are the risk factors for Diabetic Foot Ulcers. Annual assessments of knowledge, practice, skills and behaviour is requisite for patients with diabetes towards diabetic foot care.

Keywords: Diabetes foot care, Diabetes, Ayurveda, Metabolic disorder.

INTRODUCTION

Diabetes mellitus (DM) is paramount and common metabolic disorder that has impacted about 20% of the population worldwide. The incidence of diabetes mellitus is burgeoning expeditiously and by 2030, it will grow up to 366 million. This estimation occurred owing to advanced technologies in treatment, longer life expectancy and changing dietary habits.[1] The overall prevalence rate of this complication is 1.3-4.8%.[2] A systematic review of 78 studies reported prevalence of 0.003-2.8% and 0.01-0.4% for diabetes related peripheral neuropathy and peripheral arterial disease, respectively.[3] Even though there are numerous impediments affecting the person with diabetes, none are more devastating than diabetic foot ulcers owing to diabetes progression. Major contributing factors that cause diabetic foot ulcers are peripheral neuropathy, peripheral arterial disease, and immunosuppression. However, in developing countries shortage of trained healthcare providers, lack of knowledge, delay in seeking foot care and barefoot walking are common factors that adds up to the burden of foot disease.[4] Thus, the main objective of this clinical case report is to discuss the importance of etiological diagnosis, considering factors and treatment for diabetic foot ulcer.

CASE REPORT

Patient Information: A 72 years old female patient came up with 8 years old diabetes, accompanied by cellulitis which results in septic foot. The patient was not able to walk and sit without assistance, otherwise healthy. Also, she was not aware of management and treatment for diabetes, which has led to diabetic foot ulcer later.

Clinical findings: The test reports from patient revealed that till November 2020, HbA1c was 11.1%, estimated average glucose- 272 mg/dL, microalbumin: creatinine- 61.35 mg/g and A:G ratio was 2.05, however, rest of the tests entailing kidney, liver and thyroid tests were came out to be normal.

Diagnostic Assessment: After diagnosis with type-2 diabetes mellitus and septic foot, it was suggested of diabetic foot ulcer which needs immediate therapeutic intervention. The patient was not in the favour of amputation as suggested by doctors, thus, came to our clinic for treatment.

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Therapeutic intervention: Patient approaches us as on 7 July 2021 and suggested medications and treatment was:

Medication	Morning	Afternoon	Evening
Zifi Turbo 600 mg	1	-	1
Tablet Ceftum 500 mg	1	-	1
Capsule Vizylac	-	1	-
Tablet crocin	For fever or pain (when required)		
Daily dressing with T. Bactointment + Betadine + Hydrogen peroxide			

Actual treatment started on 9 July 2021 and following medications were administered:

Medication	Morning	Afternoon	Evening
Diabban powder	1 Table spoon	-	1 Table spoon
Capsule Diabban	3	-	3
Capsule Anergex	1	-	1
Basant Kusumakar Ras	1	-	1
Panchtikta Ghrit Guggal Tablet	1	-	1
Raktapachak Capsule	1	-	1
Fresh Moring Capsule	-	-	1

Along with this medication, patient was advised to have gluten free diet and dairy products. Instead of whole wheat flour, it was advised to include Pearl millet flour, Barley flour and Sorghum flour in diet.

Medication	Ingredients
Diabban powder and Capsule	Bilva Patra, Gurmar, Jamun seeds, fenugreek seeds, Neem patra, Karanja seeds, Bala and Baboolcha.
Raktapachak	Patol, Sariva, Musta, Patha, Kutki
Anergex	Kaunch, Ashwagandha, Shilajeet, Shatavari, Yashtimadhu, Gokshu, Jaiphal
Hy-Cure	Shankh Pushpi, Jatamansi, Brahmi, Ashwagandha, Vacha, Sarpagandha
Fresh Moring	Harde, Sanay, Shunthi, Pippal, Rock Salt, Black Salt, Fennel

These ayurvedic medicines contains numerous compounds that play pivotal role in preventing diabetes and other complications. Gymnemic acid present in Diabban powder and capsules has atomic arrangement similar to glucose molecules. These molecules fills the receptors in external layer of intestine, thus, deterring the absorption of sugar molecules and lowering the blood glucose level. Similarly, these molecules also fills the receptors on the taste buds, hence, preventing the activation of sugar molecules present in the food products, thereby, curbing the sugar cravings. The jamun seeds is used as traditional medicine to treat diabetes. Its hypoglycemic properties helps scavenging free radicals in diabetes caused by excessive oxidative stress, elevated levels of glutathione peroxidase and glutathione-s-transferase. Another constituent in Diabban powder and Capsule is Bilva Patra which is quite effective against diabetes as it mushrooms the potential to use the external load of glucose in body by stimulating glucose intake similar to insulin. It also lowers the oxidative stress by reducing lipid peroxidation, conjugated diene and hydroperoxide levels and elevating superoxide dismutase, catalase, glutathione peroxidase and glutathione levels in serum and liver. Various other ingredients in this medication such as fenugreek seeds increases the insulin sensitivity by controlling glucose transporters and signalling transduction in liver and adipose tissues. *Basant Kusumakar Ras* is used for nerve and body tone up; Panchtika Ghrit Guggle and Raktapachak is used for healing wound and purification of blood; Hy cure is used for stress management; Fresh Moring is used to treat constipation.[5] Overall, these medications helps the patient to control diabetes and manage other health related issues. By the end of November 2021, the patient healed, wound disappear completely and was able to walk without any support.

Figure 1: Status of the foot before the treatment

Figure 2: Status of the foot after the treatment

DISCUSSION

India presents 77 million patients with diabetes which is the second-highest number after China. The number of diabetic foot patients are mushrooming in both urban and rural regions with prevalence of 4 to 10% in the affected population along with 85% of amputations preceded by foot ulcers. In India, neuropathic lesions account for 80% of foot ulcers, with neuroischemic making up the remaining 20%.[6] The prevalence of the peripheral arterial disease is 3.2% in diabetic patients of age less than 50 years and it increases to 33% in patients with age more than 80 years, however, this increase is associated with both age and the duration of diabetes.[7] In India, approximately 100,000 legs are amputated every year and this numbers is increasing day by day.[8] Diabetic foot ulcers (DFU) encompass 12–15% of total cost of diabetes in the developed countries, that increases to 40% in the developing countries.[9] In Saudi Arabia, the prevalence of diabetes was reported 13.4% Saudis aged 15 years or older [10] and in Pakistan 12.1% for males and 9.8% for females aged ≥25 years.[11] A systematic review on the prevalence of type 2 diabetes in Iran showed a range of 3 to 20% in different provinces.[12]

Treatment of DFU is quite expensive and about 49-85% of DFUs can be prevented by spreading awareness and administering proper measures.[6] Numerous risk factors such as age, duration of diabetes, consumption of alcohol and tobacco, insulin treatment, rural locations and inadequate treatment or local remedies worsens the diabetic complications. Also, social and cultural practices like barefoot walking, squatting while working, insufficient facilities in remote areas, poor socioeconomic conditions deter the monitoring of leading cause of foot ulcers.[13]

Diabetic Foot Ulcers significantly impacts the patient's quality of life when amputation is performed, however, this can be prevented using educational and care strategies.[14] Data has shown that 25% of diabetic patients develop foot ulcer in their lifetime but the cost of treating a DFU is twice the cost of other chronic ulcers.[15] Ndosi et al., reported demise of 15.1% patients within the year of presentation, healing of ulcer in 45.5%, but it recurred in 9.6%. Higher frequency of healing could be seen in participants with a single ulcer on their index foot rather than those with multiple ulcers (hazard ratio 1.90, 95% CI 1.18 to 3.06).[16]

Comprehending the knowledge and practice in patients with diabetes is important to implement better control of diabetes and its complications. A study from North India by Ahmad and Ahmad on 124 patients with diabetes observed that 60.5% and 79.0% had lower scores in knowledge and practice toward diabetes, respectively.[17] Jackson et al., recorded that 79.5% of diabetic patients from Nigeria had more than 70% of overall knowledge about self-care.[18] The study in Malaysia showed that the 58% of patients had poor knowledge and 61.8% of them had poor practice pertaining foot care.[19]

Amid diabetic complications, the foot ulcers are contemplated as the most preventable ones. Poor practices and knowledge are the risk factors for Diabetic Foot Ulcers. Good knowledge and practice towards diabetic foot care meagre the risk of diabetic foot complications and amputation.[6] According to American Diabetes Association, annual assessments of knowledge, skills and behaviour is requisite for patients with diabetes.[18]

CONCLUSION

In this case study, confinement leads to curtailment of issues related to foot ulcers and aids in avoiding amputation, since she focused on her disease. During the treatment, patient cooperates completely and become aware of importance of taking care of herself. After one-year, right foot with ulcer was completely healed.

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Conflict of interest

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