

Effect Of Integrated Naturopathic and Yoga Therapies in a Management of Diabetic Foot: A Case Study

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ABSTRACT

Ulceration of the foot in diabetes mellitus (DM) is common and has a significant socioeconomic impact. It leads to disabling and amputation of the leg. Naturopathy is a drugless system primarily based on the theories of vitality, toxemia, and the self-recovery capability of the body.

A 55-year-old male patient of a security job had a right sole ulcer in his leg and increased sugar level diagnosed as Diabetic foot ulcer (DFU). Hydrotherapy and diet were the main treatments. Yoga therapy is the perfect treatment to reduce stress and mood. The combined effect of Naturopathy in the form of water-based packs, sun-therapy, and nutrition avoided the Amputation. After 4 months of treatment size of the ulcer decreased and the patient was able to walk independently. The blood test relieved normal HbA1c and plasma glucose.

Keywords: Diabetic foot, Yoga and Naturopathy, HBA1C, Sunbath

1. INTRODUCTION

Diabetic foot ulcers (DFUs) are one of the most common disorders in diabetes. There are two kinds of DM “insulin-dependent diabetes” is due to the body’s inability to produce and secrete insulin and the second one is recognized as “non-insulin-structured diabetes” This happens because the cells are unable to respond to the insulin the body produces. Ulcers bring out skin corrosion further results in the loss of epithelium elongate from the dermis to deeper tissues. This is due to the effect of increased blood sugar levels on two metabolic pathways that contribute to the cause of obstacles of DM [1].

Diabetic patients are more likely to develop a variety of life-threatening problems and chronic diabetic foot ulcers (DFU) due to increased medical needs, reduced quality of life, and excessive financial and

psychological stress [2]. Long-term hyperglycemia is a common cause of foot complications in those with DM. Neuropathy and peripheral vascular disease are significant complications in diabetic feet. Concurrent diabetes in feet leads to the development of ulcers [3].

Most commonly DFU is a result of peripheral neuropathy like sensory, motor, and autonomic. Physical and thermal trauma triggered by sensory neuropathies can cause patients to feel defensive, leading to the development of ulcers [4]. Diabetes causes numerous, intricate, and expensive complications in the lower extremities. The presence of Diabetics associated foot ulcers can be a consequence of reduced joint mobility and plantar friction, which can also lead to swelling and inflammation. This skin is weakened by increased friction and pressure, which can result in blisters, infections, calluses (called protozoa), ulcers, or cuts, with serious consequences [5]. Diabetes is believed to be more prevalent in certain populations, 6% in the group of Medicare beneficiaries, 5.0% among US populations, and 6.3 % among the general population [6].

As per the international diabetic association in 2015, there was a range of 2.1%- 4.4% of lower extremities amputations seen. The 50% prevalence seen in people with diabetes ranged from 0.9%-2.4% [7].

CASE STUDY

A male patient aged 55 years with an old case of type 2 NIDDM on irregular medication was diagnosed with diabetic ulceration in his right Sole, unable to walk independently, and came to our naturopathy hospital on 25-08-2022. He underwent Allopathic medications and they advised him to do Amputation from above his right knee. The patient also had foul-smelling discharge from the foot and had auto amputation of the 4th toe due to gangrene. On Examination patient's general condition was poor. Local examination of the right foot revealed gangrene of the sole and auto amputation of the 4th toe. Distal pulsation of the right foot was Mild. The left foot is clear. At the time of admission, the patient is under insulin medication, wound debridement, and dressing. Family His parents are diabetic. He was a chain smoker before 2 years. He has been under allopathic medications for the past 18 years. His sugar level did not come normal and they advised him to do amputation. He has been Assessed for FBS, PPBS, and HbA1C at baseline and after four months of intervention, there were significant changes observed in FBS, PPBS, and HbA1C compared to the baseline. Hence this case was studied to assess the impact of Naturopathy and yogic interventions.

2. CLINICAL FINDINGS

Distal pulsation was very mild on the affected foot compared to the left foot; skin thickening was also seen in the affected right foot. The sensation was absent on the right foot and mild on the left foot. Discoloration of the right foot compared to the left foot. Other general physical examinations are normal.

3. DIAGNOSTIC ASSESSMENTS

Based on the guidelines of the World Health Organization and the medical standards of diabetes published by the American Diabetic Association (ADA), Plasma glucose concentration was used to evaluate diabetics, either based on the fasting blood glucose level or the HBA1C concentration [8].

4. THERAPEUTIC INTERVENTIONS:

Naturopathy and yogic interventions are given for 1 month. A detail of intervention is given in Table 1 and Table 2. Follow up the diet is given in Table 3.

Table 1: Naturopathic Interventions

First week 25-08-2022 to 31-08-2022	<u>Morning treatment</u> Lukewarm water Enema – 20 minutes. cold abdomen pack – 15 minutes, sunbathing in the diabetic foot area – 40 minutes. Wound cleaning – 10 minutes	<u>Afternoon treatment</u> Cold abdomen pack – 15 minutes and eye pack – 10 minutes, neutral spinal compress – 15 minutes, Sunbath to the diabetic foot area – 40 minutes. Wound dressing – 10 minutes
Second week 1-09-2022 to 7-09-2022	Cold abdomen pack – 15 minutes, sunbathing in the diabetic foot area – 40 minutes. Wound cleaning- 10 minutes.	Gastro-hepatic pack – 15 minutes, Sun exposure to the affected part – 40 minutes Wound dressing – 10 minutes
Third week 8-09-2023 to 14-09-2022	Lukewarm water enema- 15 minutes, partial massage to hands and abdomen- 35 minutes. sun exposure to the affected foot- 40 minutes Wound cleaning- 10 minutes	Kidney pack- 15 minutes. Sun exposure to the affected part- 40 minutes. Wound dressing- 10 minutes
Fourth week 15-09-2022 to 21-09-2022	Cold abdomen and eye pack- 10 minutes, sun exposure to the affected part -40 minutes, Wound cleaning- 10 minutes	Gastro-hepatic pack- 15 minutes Sun exposure to the affected part- 40 minutes Wound dressing- 10 minutes

Table 2: Dietary intervention

Days	Early morning	Mid-morning	Afternoon	Mid-afternoon	Evening	Night	Mid-night
First week (25-08-2022 to 31-08-2022)	ASH J (200 ml)	RG (200 ml)	RV&BV (200 gms)	KKJ (200 ml)	CU (200 ml)	BV&RV (200 gms)	AMLA J (200 ml)
Second week (1-09-2022 to 7-09-2022)	FG J (200 ml)	RG (200 ml)	RV&BV (200 gms)	KKJ (200 ml)	CU (200 ml)	BV&RV (200 gms)	ASH J (200 ml)

Third week (8-09-2023 to 14-09-2022)	BG J (200 ml)	LGI F (200 ml)	RV&BV (200 gms)	AMLA J (200 ml)	CU (200 ml)	BV&RV (200 gms)	FG J (200 ml)
Fourth week (15-09-2022 to 21-09-2022)	KKJ (200 ml)	LGI F (200 ml)	RV&BV (200 gms)	FG J (200 ml)	CU (200 ml)	BV&RV (200 gms)	AMLA J (200 ml)

[Ash-Ash gourd juice, RG- Ragi Ganji, RV&BV-Raw Diet& Boiled diet, KKJ- Knol- Khol juice, CU-cucumber, LGI fruits- Low glycaemic index fruits, FG J- fenugreek juice, BG J- bitter gourd Juice,]

Table 3: Follow up Diet

Days	Early morning	Mid-morning	Afternoon	Mid afternoon	Evening	Night	Mid night
First week (22-12-2022 to 28-12-2022)	ASH J (200 ml)	AMLA J (200 ml)	RV, FR (200 gms)	KKJ (200 ml)	CU (200 ml)	RV, FR (200 gms)	FLX J (200 ml)
Second week (29-12-2022 to 4-01-2023)	CU J (200 ml)	AMLA J (200 ml)	RV, FR (200 gms)	ASH J (200 ml)	CU (200 ml)	RV, FR (200 gms)	FLX J (200 ml)
Third week (2-01-2023 to 08-01-2023)	BG J (200 ml)	AMLA J (200 ml)	RV, FR (200 gms)	CU J (200 ml)	CU (200 ml)	RV, FR (200 gms)	FLX J (200 ml)
Fourth week (09-01-2023 to 16-01-2023)	CR J (200 ml)	AMLA J (200 ml)	RV, FR (200 gm)	BG J (200 ml)	CU (200 ml)	RV, FR (200 gms)	FLX J (200 ml)

[Ash-Ash gourd juice, RG- Ragi Ganji, RV&BV-Raw Diet& Boiled diet, KKJ- Knol- Khol juice, CU-cucumber, LGI fruits- Low glycaemic index fruits, FG J- fenugreek juice, BG J- bitter gourd Juice, FLX J- Flax seed juice]

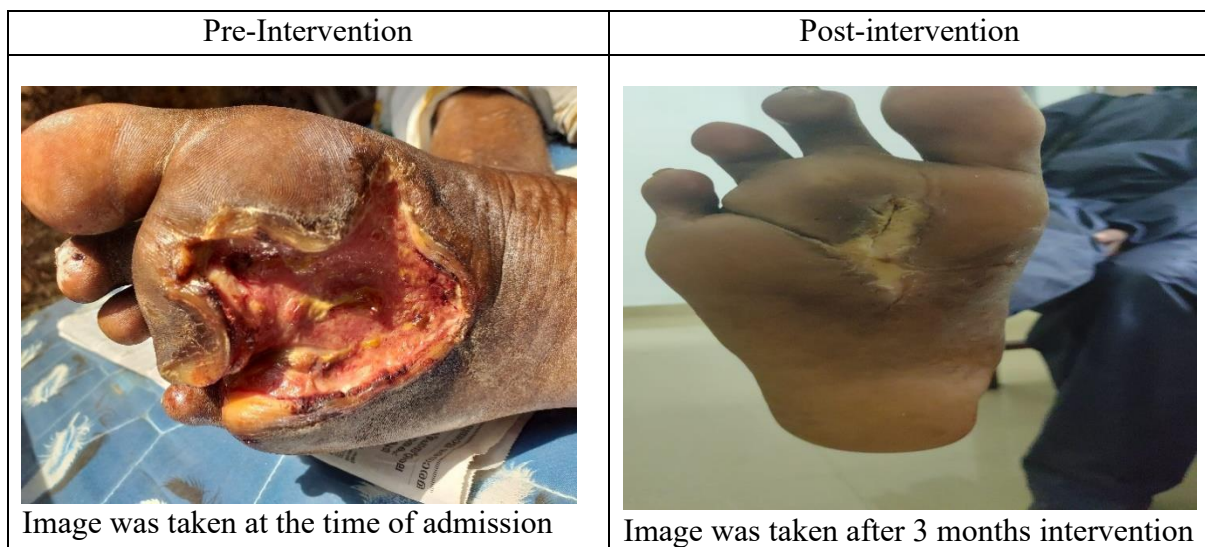
Yogic interventions: The yogic intervention consists of loosening exercise, pranayama and meditation. Given for 35 min everyday early morning.

5. FOLLOW-UP AND OUTCOMES

Table 4.

Variables	Pre	Post (after 3 months)
FBS (Fasting blood) (mmol/L)	240	110

PPBS (Post prandial blood) (mmol/L)	420	136
HbA1c (Glycated hemoglobin) (mmol/L)	11	5
ESR (mm/hour)	50	20
RBC (x 10 ⁹ /L)	4.33	5.22
WBC (x 10 ⁹ /L)	10000	9400
HB (mmol/L)	10.3	14
PLT (x 10 ⁹ /L)	2.76	2.79
EO (x 10 ⁹ /L)	10	8
LYMP (x 10 ⁹ /L)	31	30
BASO (x 10 ⁹ /L)	0.3	0.2
MCH (fmol/cell)	23.7	25
MCHC (g/dL)	33.3	33.6
MCV (fl)	71.3	78
PCV (l/l)	30.9	38



6. DISCUSSION:

The Results of this research show that an integrated approach of Naturopathic and yogic interventions is effective in the case of diabetic foot ulcers with no side effects. Our patient was able to stop using diabetic medication after 4 months. Unhealed diabetic foot ulcers can result in up to 75% of lower extremity amputations [9]. Communicate with the patients about the ideal blood glucose level and HBA1C levels and follow standard diabetes treatment recommendations to prevent or slow the progression to peripheral neuropathy. Naturopathic treatment when combined with drugs has been found to be effective in regulating sugar levels among individuals with diabetes. Natural remedies, including hydrotherapy which different body systems may affected by using water in different environments and at different temperatures [10-11]. The objective of hydrotherapy is to enhance blood flow and circulation. Tissue and organs are nourished by blood which also eliminates waste products by making this important. The lack of adequate blood flow led to the loss of healing nutrients, toxins, and tissues and organ damage. The improvement of blood quality results in increased nutrient availability for cells and efficient processing of toxins [12]. cold abdomen packs and gastro-hepatic packs are used for our subjects throughout the period. Thermal and

circulatory reactions are produced in the body as a result of treating water at low, neutral, and high temperatures. During the elimination and accumulation phases, the cold hydro packs are utilized as a tonic agent throughout the reaction. Increased peripheral blood flow, tissue oxygenation, and metabolic rate can be achieved through the use of gastrohepatic packs to reduce FBS. This shows the effectiveness of three-month hydrotherapeutic treatments especially gastro-hepatic packs and cold packs lowers both HBA1C and fasting blood sugar levels this modifies the severity of diabetic foot ulcers [13].

The skin is stimulated to release nitric oxide (NO) from pre-formed reservoirs and the circulation of NO is encouraged by UVA. A significant amount of research has been conducted on plasma nitroso compounds, which exhibit a strong correlation with vasodilatation, reduced vascular resistance, sustained reduction in blood pressure, and suppression of glucose intolerance and insulin resistance [14]. Nitric oxide has been shown to regulate proinflammatory cytokines (such as interleukins, monocytes, and neutrophils) and influence downstream keratinocyte recruitment [15]. The presence of reduced NO in extracellular wound fluid is connected to a decrease in collagen content thereby diminishing wound tensile strength [16-17]. Sun exposure can be a therapeutic method for diabetic wound patients. There is one study that suggests that home remedies for weight loss and blood sugar control include naturopathy and yoga. Chronic non-inflammatory diseases are commonly treated with this treatment [18].

Diabetic patients with prolonged hyperglycemia experience a rise in oxidants (LPO and 8-OHdG) production [19]. According to earlier research, engaging in yoga asanas and breathing exercises alongside meditation not only helps control blood sugar levels but also reduces oxidative stress [20].

After 4 months of interventions, the patient had the complete wound healed and reduced blood sugar level. The wound did not reverse after the intervention. So, Yoga and naturopathy interventions can be given for diabetic reversal and diabetic foot ulcers.

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