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Study on Diabetic Foot in Sabha City

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Abstract: ***Diabetic foot is a group of pathological changes affecting the lower extremities, which usually result from complications caused by diabetes, such as peripheral neuropathy, blood vessel damage, and loss of sensation in the feet.***
This study focused on studying cases of foot disease and gangrene in the municipality of Sabha and how dangerous it is to human health, as well as knowing the prevalence of the disease and the mortality rate from this disease. After that, analyzing the categories specific to the disease in the municipality of Sabha based on one of the hospitals in the municipality. By knowing the results, the relationship between the prevalence rate of the disease and some changes is known.
The study community consisted of cases centered on diabetic foot and gangrene in the medical center in the municipality of Sabha. Random samples of 30 patients were selected from them, where a part of a sample of more than 50 people was taken and the characteristics of the sample were described into social characteristics and health characteristics. The results showed that there is a variation in the incidence rate of diabetic foot on several social indicators represented by age and gender. This is to put the results before decision makers to consult them and take the necessary recommendations in order to combat the disease.
Keywords: Diabetic foot, Sabha, Gangrene, Sugar, Gender.

I. INTRODUCTION

Diabetes has been known for thousands of years, and in the past it was considered a fatal disease, as a type 1 diabetic patient, especially among young people, did not live more than a month, while a type 2 diabetic did not live more than a year after the onset of the disease, as it was treated primitively. But the real knowledge of the causes of the disease and methods of treatment began in the first half of the twentieth century since the discovery of insulin in 1921 AD through the efforts of the scientist Frederick Banting, who, in cooperation with the scientist Charles Best, invented a method to extract the insulin hormone from the pancreas of animals to treat diabetes since 1922 and treat a patient with type 1 diabetes with insulin, whose name was Leonard [1, 2].

In English, diabetes millituse is a Greek name that dates back to BC, when it was first used by the Greeks. The word diabetic's means running water, referring to frequent urination in large quantities, and the word millituse means honey, referring to the presence of sugar in the urine.

Diabetes is considered one of the most important health challenges facing our modern world in the twenty-first century, as it has become an epidemic that threatens all countries, peoples, races and social groups alike, carrying with it diseases that are more dangerous than it, such as cardiovascular complications, diabetic neuropathy, eye and kidney diseases, and diabetic foot injuries, which may in turn lead to premature death, kidney failure, blindness, amputation of the foot or actual disability, as international statistics from the World Health Organization and the International Diabetes Federation indicate that the number of people infected with this disease in the world in 2014 reached 400 million [3, 4].

If the complications resulting from it, such as heart and arterial diseases, diabetic neuropathy, kidney failure, blindness and amputation, all lead to varying degrees of disability, decreased survival and a lower standard of living, and increased economic burdens on the individual, the family and then society as a whole. Gangrene is one of the complications of diabetes, and it means the death of body tissues as a result of stopping blood flow to the tissues or due to being infected with a severe bacterial infection as a result of diabetic foot. The patient is susceptible to wounds and ulcers in the feet that are difficult to heal if diabetic foot gangrene is not treated, and the chance of wounds becoming infected with bacteria increases as a result of the presence of wounds.

When a person is diagnosed with diabetes for the first time, of course, he will have many questions and a sense of mystery about this disease, and the educated person should be the first to provide help and make him feel that he is not the only one who has been affected by this, but there are millions of people who suffer from such a performance and most of these people live a normal and ordinary life, but the excellent thing is that you will start providing systematic and gradual knowledge about diabetes. This guide will provide you with some basic information about this disease to start building your knowledge base first. High blood sugar and lack of control of diabetes for long periods cause damage to the nerves in the feet and poor blood flow, which causes numbness and tingling in the feet, and the patient does not feel if he is injured or injured in the foot, thus increasing the risk of infection of the diabetic foot, inflammation, ulcers, and severe complications that may lead to amputation of the diabetic foot if not treated early.

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Fig 1: Diabetic foot

The study aims to achieve the following:

1) Track the temporal development of diabetic foot disease and gangrene.
2) Study the statistical pattern of diabetic foot disease and gangrene in the municipality.
3) Study the existing problems and their solutions

A. Importance of the Study

The importance of the study is achieved through:

1) Providing advice and guidance to citizens in their confrontation with diabetic foot disease and gangrene and pushing them towards early diagnosis for treatment.
2) Clarifying the extent of the disease's spread in the municipality.
3) Presenting the results to decision-makers for reference and taking the necessary recommendations to combat the disease.

B. Study Hypotheses

In order to achieve the objectives and importance of the study, several hypotheses were put forward, the validity of which will be proven.

1) The study assumes that the disease is more common among men.
2) The study assumes that there is a relationship between infection and lack of awareness of the disease.
3) The study assumes that there is a relationship between the disease and the age group.

II. PREVIOUS STUDIES

When studying the isolation and identification of the most important types of bacteria causing contamination of diabetic foot ulcers, conventional laboratory culture showed positive growth and that most of the studied isolates were resistant to multiple antibiotics and multi-antibiotic resistant, and indicated a widespread prevalence of methicillin-resistant Staphylococcus aureus among all isolates of cocci [5]. Also, molecular methods are more reliable than the conventional method in studying the microbiota of DFUs. There was a high prevalence of bacteria acquired in hospitals [6]. Also, methicillin-resistant Staphylococcus aureus was not identified using culture methods but was identified using polymerase chain reaction. Polymerase chain reaction was more sensitive but less specific than culture-based methods for identifying Staphylococcus aureus [7].

A study into the treatment of diabetic wounds through a specific protein in the body has revealed that it could become a target for an effective treatment for this disease. The researchers explained that the development of wounds in the foot or lower leg is one of the most frustrating and debilitating complications for diabetics, and once they form, they can last for months without healing, leading to painful and serious injuries. About a quarter of diabetics suffer from chronic skin ulcers, especially foot ulcers, in addition to pressure ulcers, as a result of lying or sitting in the same position for a long time. Treatment of these wounds is often limited to standard care, such as moist bandages and removing damaged tissue that reduces pressure on the wound. Despite these health measures, wounds and ulcers often persist, and in severe cases, doctors resort to amputation of the foot, as diabetic wounds are the leading cause of amputations. Most previous work on wound healing in diabetes has focused on the types of cells involved in wound healing, such as immune cells, skin cells, and cells that form blood vessels [8, 9, 10].

In contrast, the study focused on a protein called TSP2, which the team found to be elevated in patients with type 2 diabetes, as well as in animal models of the disease. To determine whether TSP2 contributed to delayed wound healing, the team removed it from genetically modified mouse models of diabetes, and the researchers saw significant improvements in wound healing times compared to the group that had increased levels of TSP2 [11, 12].

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According to the World Health Organization, about 90% of the world's registered cases of diabetes are type 2, which appears mainly due to being overweight and lack of physical activity. Over time, high blood sugar levels can increase the risk of heart disease, blindness, and nerve and kidney failure. In contrast, type 1 diabetes occurs when the body's immune system destroys the cells that control blood sugar levels, and most of them occur among children. The organization indicated that 422 million people around the world suffer from diabetes and the Eastern Mediterranean region accounts for 43 million of them [13].

A study have been done on of some immune factors in diabetic foot patients with Staphylococcus aureus infection, to determine the relationship of DFUs with Staphylococcus aureus infection in diabetic patients and to reveal the role of some serum levels of adipokines and cytokines in diabetic foot patients, and to evaluate the relationship between adipokines and their expression with DFUs in diabetic patients. It was concluded that males with diabetes are more common than females with DFU and the highest rate is at the age of 31-60 years and to find serum levels of adipokines (adiponectin and leptin) higher in diabetic foot patients compared to healthy controls and that blood interleukins levels (IL-6 and IL34) are higher in people with diabetic foot compared to healthy controls [14, 15].

III. THE PRACTICAL SIDE

Data were collected between 12/2023 and 01/2024 at the Medical Center in Sabha Municipality. The samples consisted of 50 samples between men and women, with the majority of cases being in men.

A. Social characteristics

To identify the social characteristics of patients with color blindness syndrome, this study focused on several social indicators that illustrate these characteristics. These were represented in the variables of gender, age, and residence, as follows:

1) *Patient gender:* The incidence of diabetic foot and gangrene varies between males and females. The table shows that the majority of patients with diabetic foot and gangrene are males, with a percentage of 56%, which is higher than the percentage of females, which reached 44% of those affected.

TABLE I
INFECTED PATIENTS

No	Gender	Number	Percentage %
1	Male	28	56
2	Female	22	44

2) *Age:* Advancing age increases the risk of developing diabetic foot and gangrene, especially if the patient has diabetes, due to the blockage of the small blood vessels that feed the network, which leads to cutting off its blood supply.

TABLE II
AGES OF PEOPLE WITH DIABETIC FOOT AND GANGRENE

Age (years)	20-30	30-40	40-50	50-60	60-70	More than 70
Number of infected	1	8	15	14	9	3
Percentage %	2	16	30	28	18	6

The table above shows that the largest number of ages at risk of developing diabetic foot and gangrene are from 40 to 50 years old, where their number reached 15 out of the total sample, with the highest percentage estimated at 30%. While the lowest number was among patients whose ages ranged between 20 and 30 years, and their number was 1 at a rate of 2%.

3) *City residents:*

TABLE III
PATIENTS' PLACE OF RESIDENCE

Housing	Sabha city and its suburbs	Outside Sabha municipality
The number	30	20
Percentage %	60	40

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B. Health properties

It was represented in reviewing the statistical results obtained for various diseases with different gender distribution.

1) *Type of disease in males:* Through statistics on male cases, it became clear that 32% of infected people suffer from dry gangrene of two or more toes, while the percentage of people suffering from wet gangrene only reached 18%.

TABLE IV
TYPE OF DISEASE IN MALES

Type of injury	dry gangrene of fingers	Dry gangrene of two or more toes	Dry gangrene of the heel	wet gangrene
The number	8	9	6	5
Percentage %	29	32	21	18

2) *Type of disease in females:* Through statistics on Female cases, it became clear that 31% of infected people suffer from Dry gangrene of the heel, while the percentage of people suffering from Dry gangrene of two or more toes 20%.

TABLE V
TYPE OF DISEASE IN FEMALES

Type of injury	dry gangrene of fingers	Dry gangrene of two or more toes	Dry gangrene of the heel	wet gangrene
The number	5	4	7	6
Percentage %	22	20	31	27

IV. RESULTS

1) The main cause of diabetic foot is chronically high blood sugar, which leads to problems in the extremities, especially the feet, and other complications that eventually lead to diabetic foot.
2) Over time, diabetes can cause nerve damage called diabetic neuropathy. It can also make it difficult for a diabetic foot patient to feel their extremities, or to feel cold, heat, or even pain.
3) Long-term diabetes affects blood flow, causing reduced blood flow to the foot, pain, infection, and slow healing of wounds and ulcers in the diabetic foot, thus increasing the risk of foot tissue death and gangrene.
4) High blood sugar provides a suitable environment for bacteria to multiply, which increases the risk of diabetic foot ulcers becoming chronically infected and causing serious complications, such as tissue death and gangrene.
5) Diabetic foot complications can be serious if not treated properly early.

V. RECOMMENDATIONS

Diabetic foot and its complications can be prevented by taking care of your feet regularly and following these tips:

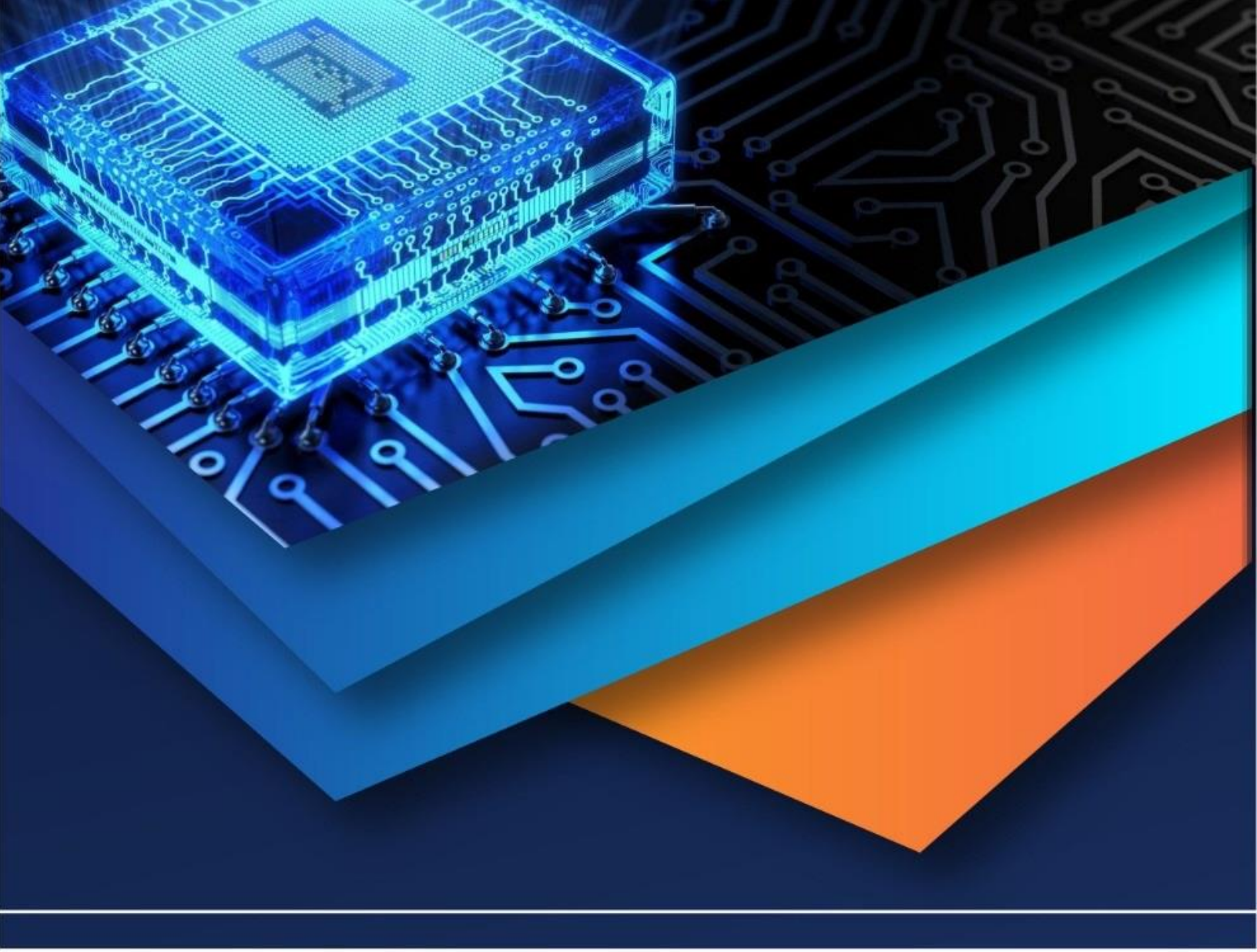
1) Control the factors that cause diabetic foot, the most important of which is controlling blood sugar levels.
2) Adhere to an appropriate diet.
3) Maintain foot hygiene.
4) Examine the feet daily, by the patient or someone else, to notice any changes in them.
5) Trim the nails carefully.
6) Use appropriate shoes.
7) Moisturize the feet, especially after bathing.
8) Use special woolen or cotton socks.
9) Treat the cracks between the toes and nails immediately if they occur.
10) Visit the doctor regularly.

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