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## Interactions Between Kidney Disease and Diabetes at Tobruk Medical Centre, Libya

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**ABSTRACT:** Diabetic kidney disease (DKD) is one of the most dangerous complications of Diabetes Mellitus type 2. the diabetes is affecting in many organs in the body especially the kidneys. KD results in increased hospitalizations and mortality rates, in particular due to cardiovascular complications, in addition to the growing difficulty of ambulatory treatment for patients with DM. The need for renal replacement therapies such as dialysis and kidney transplants also rise with DKD. there are many causes of kidney disease, but the diabetes may play a major role in kidney failure, for this reason we investigated and collected statistics from the Tobruk Medical Center in the kidney department trying to understand the relations between diabetes and renal disease whereas found in Tobruk Medical Centre about 100 (46 Females, 54 Males ) patients have renal dialysis, 57 who have DKD. kidney disease patients were older.

According to this study, there is a relation between diabetes and kidney disease at Tobruk Medical Centre, and diabetes may lead to kidney failure and dialysis. Further studies are required to confirm these findings.

**Keywords: Diabetes Mellitus, Diabetes kidney disease, Tobruk Medical Centre.**

### INTRODUCTION:

Diabetes is the condition in which the body does not properly process food for use as energy. Most of the food we consume is converted into glucose , or sugar, to be used for energy by our bodies. The pancreas, an organ located near the stomach, produces a hormone called insulin to help get glucose into the cells of our bodies. The body either does not produce enough insulin when you have diabetes or can't use its own insulin as well as it can. This induces blood sugar build-ups. This is why many people refer to diabetes as “sugar [1].

The pancreas between the stomach and the Intestine, which helps with digestion, releases into the blood a hormone which it produces, called insulin. Insulin helps all cells in the body deliver glucose to the blood. The body often does not produce enough insulin or the insulin does not function the way it should. Glucose then stays in the blood and doesn't reach the cells. blood glucose levels get too high and can cause diabetes or prediabetes [2].

When diabetes is not well-controlled, the sugar level in your blood goes up. This is called hyperglycemia. High blood sugar can cause damage to many parts of your body, especially kidneys, eyes, feet, ears and blood vessels.

The most common complication with diabetes, the small blood vessel in the body are injured. When the blood vessels in the kidneys are injured, kidneys cannot clean blood properly. The body will retain more water and salt than it should, which can

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result in weight gain and ankle swelling. which can result in weight gain and ankle swelling. May have protein in urine. In addition, waste materials will build up in blood. The filtering units of the kidney are filled with tiny blood vessels. Over time, high blood sugar levels can cause these vessels to shorten and become clogged. The kidneys become compromised without enough blood and albumin (a form of protein) passes through these filters and ends up in the urine where it shouldn't be. Diabetes can also cause nerve damage in the body. This can make bladder emptying difficult [3]. Full-bladder pressure will back up and damage the kidneys. Furthermore, if urine stays in the bladder for a long time, it may develop an infection that has a high sugar level due to the rapid growth of bacteria in urine. Approximately 30 percent of patients with type 1 (youthful onset) diabetes and 10 to 40 percent of patients with type 2 (adult onset) diabetes will ultimately have kidney failure [4].

Most people have two kidneys. The kidneys are found on either side of the spine just below the ribs. By acting as a filter to eliminate water and waste from the body, the kidneys cleanse the blood. The waste is what is left over from the food used by the body and certain functions of the body in the blood. Part of the waste is filtered out in urine, which flows down into the bladder through the drainage tubes (called ureters). Many have two kidneys. The kidneys are found on either side of the spine just below the ribs. The kidneys clean your blood by working as a filter to remove water and wastes from the body. The waste is what is left over from the food used by the body and certain functions of the body in the blood. Part of the waste is filtered out in urine, which flows down into the bladder through the drainage tubes (called ureters) [3].

Diabetes isn't responsible for all kidney damage. Other diseases can be involved. If the kidney disease is caused by diabetes, it is called diabetic kidney disease (DKD) [1].

Diabetic kidney disease (DKD) is one of the most dangerous complications of Diabetes Meletus type 2, affecting about one-third of the patients with Diabetes Meletus type 2 [5]. Kidney failure affects about 1% of persons with diabetes in the United States. A considerably higher proportion, about 40%, have less severe kidney disease. Since the second edition of Diabetes in America was published in 1995, a wealth of new information has contributed substantially to the understanding of kidney disease associated with diabetes [6].

The incidence and prevalence of diabetes mellitus have grown significantly throughout the world, due primarily to the increase in type 2 diabetes. This overall increase in the number of people with diabetes has had a significant impact on the development of DKD [7]. Diabetes is already the leading cause of end-stage renal disease (ESKD) in most developed countries, and the increase in the number of people with ESKD worldwide parallels diabetes growth [8].

Recent research in humans and animals strongly support the idea that the primary blame for diabetic nephropathy lies with the diabetic state's metabolic derangements [9].

No evidence of a sex difference in the association between diabetes mellitus and chronic kidney disease was found. However, the excess risk for end-stage renal disease was higher in women with diabetes than in men with the same condition,

from which we assume that the female gender could accelerate the disease progression [10].

Diabetic nephropathy patients were older, more likely to occur in earlier stages of CKD and had a higher prevalence of males; while those with CKD of unknown etiology were younger, more females were diagnosed and more often in stage V [11].

## MATERIAL AND METHOD

In this study, we investigated the relation between diabetes and kidney disease, and how the diabetes is affecting in the kidneys and other organs in the body.

There are many causes of kidney disease, but diabetes may play a major role in kidney failure, so we collected statistics from the Tobruk Medical Center in the kidney department between 2018 and 2019 trying to understand the relationship diabetes and renal disease in order for us to human to avoid the kidney failure and lack of access to the stage of dialysis. of the patients suffering from renal failure about 100 patients in the city of Tobruk as shown in Table 1 whereas were 46 fameles and 54 males this based on patients of kideny departrment who have renal dialysis as shown Figure 1 and 2

**TABLE 1. Patient kideny dialysis with diabetuis.**

Age of Patient (years)	Patient with Diabetes Mellitus			
	Male number		Female number	
	+	-	+	-
20-30	3	2	2	2
30-50	6	8	8	8
50-70	19	8	12	9
70-100	4	1	6	2

"-" no diabetes malletus

"+" diabetes malletus



**Figure 1: Patient have renal dialysis with DM.**



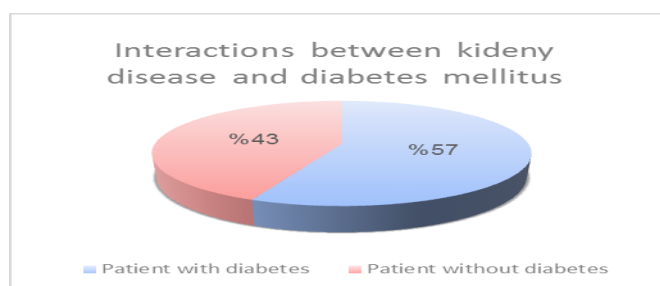
**Figure 2: A dailysis machine in kidney department in Tobruk medical centre**

## Results And Discussion

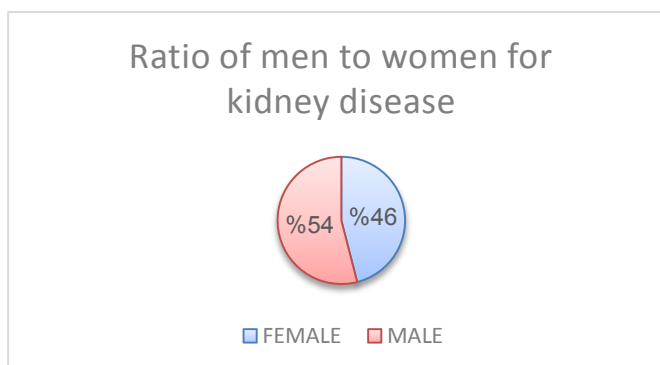
The Aim of this study ro investigated the realatiom about diabetes and kidney and Diabetic kidney disease (DKD). Diabetes play a major role in kidney failure, So we collected statistics from the Tobruk Medical Center in the kidney department between 2018 and 2019 trying to understand the relation diabetes and diabetes renal disease for us to human life to avoid kidney failure and lack of access to the stage of dialysis.

According to our findings from our statistics, we may say that diabetes may be a cause of renal failure, but it is not possible to confirm the actual relationship. Perhaps this statistic may be confined to the Tobruk centre only or confined to the city of Tobruk, but the person should actually take this statistic to avoid diabetes. To the destruction of human.

The following figure will show the percentage obtained by the statistics at the Tobruk Medical Center in the kidney department:

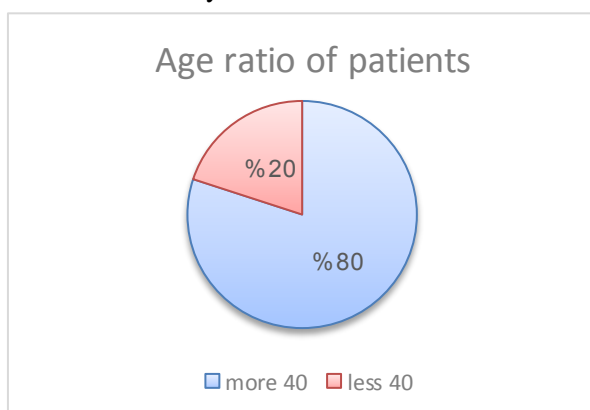


**Graph 1: Interactions between kidney disease and diabetes mellitus**



**Graphic 2: ratio men for women with kidneys disease.**

As shown previous graphic 2 the men are more than women have dialysis Tobruk Medical Centre and in graphic 3 the patient that have kidney disease most of them more than 40.



**Graphic 3: Age ratio of patients.**

Kurts, C., *et al* (2013) Not all kidney damage is caused by diabetes. Other diseases can be involved. If the kidney disease is caused by diabetes, it is called diabetic kidney disease (DKD)[1]. This agree with this study where 43% of patients with kidney disease no have diabetes.

Mauer, S. M., *et al* 1981 study has mentioned that the recent studies in human and animals strongly support the concept that the primary responsibility for diabetic nephropathy rests with the metabolic derangements of the diabetic state [8]. And this agreement in this study.

Shen, Y., *et al* 2017 in study found no evidence of a sex difference in the association between diabetes mellitus and chronic kidney disease. However, the excess risk for end-stage renal disease was higher in women with diabetes than in men with the same condition, from which we assume that the female gender could accelerate the disease progression [10]. That no agree with this study whereae the ratio was men and women 46% : 54 % respectively.

Rajapurkar, M. M. , *et al* (2012 ) conducted studies Diabetic nephropathy patients were older, were more likely to occur in earlier stages of CKD and had a higher proportion of males; while those with CKD of unknown etiology were younger, more females and more often presented in stage V [11]This agree with this study

### Conclusion:

In patients with DM2 and kidney disease, adequate glycaemic monitoring and control adapted for diabetic patients is required to prevent hypoglycaemia and other glycaemic disarrays. Understanding the renal physiology and pathophysiology of DKD has become important for all the specialties that treat diabetic patients. According to statistics in this study, we may say that diabetes may be a cause of renal failure, but it is not possible to confirm the actual relationship. Perhaps this statistic may be confined to the center of Tobruk only or confined to the city of Tobruk, but the person should actually take this statistic to avoid diabetes.

### Acknowledgement

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**المستخلص:** مرض الكلى السكري هو واحد من أخطر مضاعفات مرض السكري من النوع الثاني. يؤثر مرض السكري في العديد من أعضاء الجسم وخاصة الكلى. بالإضافة إلى التعقيد المتزايد في العيادات الخارجية لمرضى السكري، يؤدي مرض الكلى السكري إلى زيادة معدلات دخول المستشفى ومعدلات الوفيات، خاصة بسبب مضاعفات القلب والأوعية الدموية. يزيد مرض الكلى السكري أيضاً من الطلب على علاجات نقل الكلى، مثل غسيل الكلى وزرع الكلى.

هناك أسباب عديدة لأمراض الكلى، ولكن السكري قد يلعب دوراً رئيسياً في الفشل الكلوي، ولهذا السبب قمنا بالتحري وجمع الإحصائيات من مركز طبيرق الطبي في قسم الكلى في محاولة لفهم العلاقة بين مرض السكري ومرض الكلى السكري حيث وجد في مركز طبيرق أن حوالي 100 مريض (46 إناث و 54 ذكور) يقومون بغسيل الكلوي وبينهم 57 مريض بالكلى السكري. وكان اغلبية المرضى ممن اعمارهم فوق الاربعين

ووفقاً لهذه الدراسة، هناك علاقة بين مرض السكري وأمراض الكلى في مركز طبيرق الطبي، وقد يؤدي مرض السكري إلى الفشل الكلوي وغسيل الكلى، ويلزم إجراء مزيد من الدراسات لتأكيد هذه النتائج.

**الكلمات المفتاحية:** داء السكري، الكلى السكري، مركز طبيرق الطبي.

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