

# Metabolic Illnesses and Renal Function in Patients by Diabetes

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## Introduction

Changes in eating habits and lifestyle have contributed to the continued rise in the number of obese patients, and the number of diabetic patients has risen in tandem. The total number of registered diabetes patients in 2020 indicates a very high prevalence of diabetes (10.7%); however, the glycemic control rate, defined as a HbA1c level of 6.5, was only 24.1%. South Korea has the third highest diabetes-related mortality rate in the Organization for Economic Cooperation and Development, trailing only Mexico and Turkey. As a result, national diabetes management is critical. Furthermore, 28.6% of type 2 diabetes patients have macrovascular complications like cardiovascular disease and peripheral arterial disease, while 67.2% have microvascular complications like retinopathy, nephropathy, and neuropathy [1].

Diabetic kidney disease (DKD) is the most common cause of end-stage renal failure and is a serious diabetes-related complication. Because many people die as a result of the early onset of cardiovascular disease associated with impaired renal function, early detection and management of DKD is critical. However, unlike type 1 diabetes patients, those with type 2 diabetes and impaired renal function may not have albuminuria, and their estimated glomerular filtration rate (eGFR) may be reduced for a variety of reasons, making early DKD management difficult [2]. Several risk factors, including metabolic syndrome, hypertension, hyperglycemia, insulin resistance, proteinuria, advanced glycation end products (AGEs), and oxidative stress, can lead to DKD. As a result, various methods for monitoring renal function in diabetic patients are required. Patients with metabolic syndrome, in particular, have an increased risk of type 2 diabetes and a high risk of diabetes-related complications; thus, the relationship between metabolic syndrome and type 2 diabetes must be investigated [3].

Approximately 72% of adult patients with diabetes aged 30 years or more had hypercholesterolemia which is closely associated with AGE levels and is associated with higher blood AGE levels in patients with hyperlipidemia, retinopathy, or peripheral neuropathy compared to those without this disease. Furthermore, this is linked to metabolic syndrome. A study that compared skin auto fluorescence (SAF) in two patient groups based on the presence or absence of metabolic syndrome and measured the AGE level in the skin found that the SAF value in the metabolic syndrome group was significantly higher (mean SAF: 2.1 AU) compared to the control group (mean SAF: 1.9 AU). Furthermore, there was a link between SAF and high-density lipoprotein cholesterol (HDL-C).

As a result, understanding and managing the various causes of metabolic syndrome is critical for preventing DKD. The threshold phenomenon, in which the prevalence of metabolic syndrome, including diabetes, rapidly increases, is particularly noticeable in middle-aged people (age 40). According to data from the Korean Diabetes Association and the Health Insurance Review and Assessment Service, the diabetes awareness rate among patients with diabetes aged 50 or less is approximately 60%, and 60.6% of people in their 40s and 60s had no experience receiving diabetes education. As a result, it is expected that these people will have difficulty controlling their diabetes. Furthermore,

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poor diabetes management can lead to diabetes-related complications such as DKD. Metabolic illnesses refer to a group of conditions that affect the body's metabolism, including the processing and breakdown of nutrients. Diabetes is one such metabolic illness that affects millions of people worldwide. Diabetes can lead to various complications, including damage to the kidneys, which can result in impaired renal function.

## Description

The kidneys play a crucial role in filtering waste products from the blood, regulating electrolyte balance and blood pressure, and producing hormones that control red blood cell production. However, when blood glucose levels are consistently high due to uncontrolled diabetes, the kidneys' blood vessels can become damaged. This damage can result in a condition known as diabetic nephropathy or diabetic kidney disease, which is a common complication of diabetes. Diabetic nephropathy occurs when high blood glucose levels cause the tiny blood vessels in the kidneys to become damaged and leak protein into the urine. Over time, this can lead to scarring and damage to the kidneys, which can eventually result in kidney failure. Renal function tests are used to determine the extent of the damage and to monitor kidney function in patients with diabetic nephropathy [4].

Managing blood glucose levels is key to preventing or slowing the progression of diabetic nephropathy. This can be achieved through lifestyle changes, such as regular exercise, a healthy diet, and weight loss. Medications such as insulin and oral hypoglycemic agents may also be prescribed to help control blood glucose levels. In addition to managing blood glucose levels, controlling blood pressure is also crucial in preventing or slowing the progression of diabetic nephropathy. Blood pressure medication may be prescribed to help keep blood pressure under control, along with lifestyle changes such as reducing salt intake, maintaining a healthy weight, and regular exercise [5].

## Conclusion

In conclusion, metabolic illnesses such as diabetes can lead to complications such as impaired renal function. Diabetic nephropathy is a common complication of diabetes, which can result in kidney damage and eventually kidney failure. Managing blood glucose levels and blood pressure through lifestyle changes and medication is crucial in preventing or slowing the progression of diabetic nephropathy and preserving renal function in patients with diabetes.

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## Conflict of Interest

There is no conflict of interest by author.

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