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ИНСУЛИНОРЕЗИСТЕНТНОСТЬ И ИНДЕКС ПОЧЕЧНОЙ РЕЗИСТЕНТНОСТИ У ПАЦИЕНТОВ С ВПЕРВЫЕ ДИАГНОСТИРОВАННЫМ САХАРНЫМ ДИАБЕТОМ 2 ТИПА И ГИПЕРТОНИЕЙ

Резюме: У людей с диабетом наблюдается более высокий индекс почечного резистентности (ИПР). Мы изучили потенциальную независимую связь между ИПР и инсулинорезистентностью.

Ключевые слова: допплеровское ультразвуковое исследование, лабораторный анализ, ИПР, альбумин в моче, инсулинорезистентность, сахарный диабет 2 типа и индекс оценки гомеостаза (HOMA).

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INSULIN RESISTANCE AND RENAL RESISTIVE INDEX IN NEWLY DIAGNOSED TYPE 2 DIABETES MELLITUS AND HYPERTENSION

Resume: People with diabetes have a higher renal resistive index (RRI). We examined the potential independent relationship between RRI and insulin resistance.

Key words: Doppler ultrasound, laboratory analysis, RRI, urine albumin, insulin resistance, type 2 diabetes and homeostasis model assessment (HOMA) index.

Abstract: Doppler ultrasound, laboratory analysis, medical history, physical examination, and 24-hour urine albumin excretion were all examined. It has been demonstrated in the past that a raised RRI level can be distinguished by a threshold of at least 0.70. Included were 80 patients with type 2 diabetes and essential hypertension who had just received a diagnosis. The RRI of 61 patients was modest (<0.70). Patients with high RRI were older and had greater serum creatinine, pulse pressure, and homeostasis model assessment (HOMA) index than those with low RRI.

Introduction

Intrarenal hemodynamics is evaluated using duplex Doppler ultrasonography. Renovascular resistance is reflected in the renal resistive index (RRI), which is determined from blood flow velocities in arteries and is known to rise in a number of illnesses [1]. Numerous studies have shown that RRI is higher in diabetic patients than in non-diabetic subjects, and that RRI associated with diabetic nephropathy is higher than that associated with other specific causes of renal diseases (such as nephrosclerosis and chronic glomerulonephritis) [2], [3], [4], [5], [6], [7], and [8]. According to earlier research, arteriolosclerosis rather than interstitial fibrosis may be a significant factor in the methods by which RIs of intrarenal arterioles rise [9]. Furthermore, histopathologic analysis of renal biopsies from diabetic patients revealed arteriosclerotic glomerulosclerosis in addition to the usual diffuse or nodular lesions [10]. Additionally, it was noted that because systemic atherosclerotic vascular disease negatively impacts renal blood perfusion, which lowers GFR, macroangiopathy, not microangiopathy, is likely to affect glomerular filtration rate (GFR) regardless of the status of microalbuminuria, which has been thought to be a risk factor for diabetic nephropathy and the progression of renal insufficiency [1], [8]. In fact, RI and renal function have been linked in a number of papers [5], [9], and [7]. According to Ohta et al. [8], there is a substantial correlation between the severity of systemic atherosclerosis and increased RI of the primary renal arteries.

However, it has been shown that atherosclerotic renal artery damage is associated with elevated RRI [2], [3].

Reduced peripheral tissue responsiveness to the hormone's effects is known as insulin resistance (IR). This refers to insulin's diminished capacity to promote glucose uptake in peripheral tissues (primarily skeletal muscle and adipose tissue) and to inhibit hepatic glucose output in an attempt to maintain glucose homeostasis. Thus, the term "insulin resistance" almost always refers to the hormone's effects on metabolism [4]. Obesity, essential hypertension, dyslipidemia, inflammation, and poor glucose metabolism are among the

metabolic disorders linked to insulin resistance [5]. Insulin resistance is commonly observed in people with type 2 diabetes mellitus [10] and hypertension [6], [11].

Materials and Methods

This study was conducted in the Nephrology Department's outpatient hypertension clinic between May 2022 and April 2024. Patients with type 2 diabetes mellitus and newly diagnosed essential hypertension who had not previously received treatment with insulin, oral hypoglycemic medications, antihypertensive medications, or lipid-lowering medications made up the study population. Individuals with secondary hypertension, type 1, and blood creatinine levels higher than 1.4 mg/dL

Results

The study comprised eighty patients with essential hypertension and newly diagnosed type 2 diabetes mellitus (mean age, 55.5 ± 12.6 years; male-female ratio, 25/55). According to the recognized RRI threshold of 0.70, 61 patients (76.2%) had low RRI and 19 patients (23.8%) had high RRI. Patients with high RRI were older, had higher serum creatinine and pulse pressure, and were insulin resistant as shown by a higher HOMA index as compared to those with low RRI. Insulin levels tended to.

Discussion

In this investigation, we discovered that individuals with type 2 diabetes mellitus and newly diagnosed essential hypertension who had high RRI were more insulin resistant than those with low RRI, as indicated by a higher HOMA index. RRI was positively and independently correlated with age and pulse pressure. We discovered that RRI was positively and independently correlated with IR, which is a novel finding.

In conclusion

The pathogenesis of type 2 diabetes mellitus has been thought to be mostly caused by insulin resistance.

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