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Diagnostic And Prognostic Importance Of Proteinuria In Development Of Chronic Kidney Disease In Persons With High Risk Factor

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ABSTRACT

Proteinuria, which is a predictor of early diagnosis of chronic kidney disease, is also a risk factor for the development and progression of renal pathology. The relationship is multifaceted and is built according to the type of feedback. On the one hand, the kidney can act as a target organ for most risk factors such as arterial hypertension, ischemic heart disease, diabetes mellitus, age, obesity associated with albuminuria. On the other hand, decreased renal function and severe albuminuria are an important reason for the accelerated development of end-stage chronic kidney disease.

KEYWORDS

Proteinuria, albuminuria, chronic kidney disease, risk factors.

INTRODUCTION

Chronic kidney disease (CKD) is a general medical problem with profound socio-economic consequences associated with its widespread prevalence in the population (10-15% of the population), disability and mortality due to the development of end-stage renal failure (ESRD) and cardiovascular complications (SSO), the risk of which in patients with impaired renal function increases tenfold [2, 4].

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For many years, the severity of the CKD problem was underestimated; it remained in the "shadow" of other socially significant diseases. Interest in this problem arose at the beginning of the 21st century, when data from large epidemiological studies (NHANES, etc.) appeared, showing a high frequency of renal dysfunction in the population, and also when it became obvious that dialysis services around the world could not cope with the constantly growing influx of patients with end-stage renal failure [5,6].

The prevalence of CKD is comparable to such socially significant diseases as hypertension and diabetes mellitus (DM), as well as obesity and metabolic syndrome. The available scientific data, today indicate the predominance of secondary nephropathies in the population, such as diabetic nephropathy, hypertensive nephropathy, and ischemic kidney disease [1, 3].

A number of factors can have a significant impact on the development and progression of chronic kidney disease. It is very important that many factors associated with the development of kidney dysfunction are also traditional cardiovascular risk factors, including arterial hypertension, diabetes mellitus (DM), age, male gender, obesity, coronary heart disease (CHD), drugs , alcohol and smoking, the state of the environment, the climate, the nature and traditions of nutrition, the presence of foci of chronic inflammation [10, 14].

The relationship between renal dysfunction and changes in the cardiovascular system is multifaceted and is built according to the type of feedback. [6, 15]. In this context, on the one hand, the kidney can act as a target organ for the action of most of the known factors associated with cardiovascular changes; on the other hand, a decrease in renal function, according to modern concepts, is an independent and important reason for the accelerated development of pathological changes in the cardiovascular system. This is due to a number of metabolic and hemodynamic disorders that develop in patients with a reduced glomerular filtration rate, when unconventional, "renal" factors of cardiovascular risk arise and come to the fore: albuminuria / proteinuria, activation of the renin-angiotensin-aldosterone system, systemic inflammation, stress , anemia, hyperhomocysteinemia, etc. [7, 12].

As is known, microalbuminuria is a marker of primary kidney damage and is widely used for the early diagnosis of CKD [13, 14].

Currently, the role of proteinuria / microalbuminuria has been established not only as a marker of activity, but also as an independent factor in the progression of CKD.

Kidney damage caused by components of proteinuria is associated with nephrotoxicity. Among the protein components with nephrotoxic effects, the role of albumin and transferrin has been established. Under the influence of proteinuria, epithelial cells change their phenotype, further exposure of these cells to albumin leads to the activation of nuclear factor (NFkB) and enhances the expression of mediators (cytokines, chemokines, growth factor, vasoactive peptides, etc.) [9, 11].

The aim of this study was to assess the importance of proteinuria / microalbuminuria as a marker of early diagnosis and as a risk factor for the progression of CKD.

MATERIALS AND METHODS

A survey of 1,087 respondents was carried out and the study included 317 people: 99 (31.2%) men, 118 (68.8%) women. The age of the examined was 17-78 years old.

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The study took place in two family polyclinics in different districts of the Bukhara region and the study included persons who were not observed by a nephrologist. Among them, 103 (32.5%) people did not go to the doctor and did not have any complaints.

To assess the possible risk factors for CKD, all subjects underwent a questionnaire survey, which included questions related to age, place of work, the presence of comorbidities and conditions, adherence to a healthy lifestyle, anthropometric data - height, weight - body mass index (BMI) was calculated using the formula Ketle, depending on what the normal body weight was allocated - with BMI <25, overweight BMI = 25-30, obesity BMI> 30. Blood pressure measured. They found out the presence in the present or the past of diabetes mellitus or episodes of increased sugar, cholesterol, changes in urine tests, arterial hypertension, nephropathy of pregnant women in women and kidney disease in direct relatives, abuse of analgesics and non-steroidal anti-inflammatory drugs. "Passion" for salty and bitter food, the presence of chronic infections such as tonsillitis, dental caries and bad habits

All subjects underwent urine analysis using Combina 13 test strips (Human GmbH Germany). These diagnostic test strips are designed to determine the semi-quantitative measurement of the concentration of microalbumin in urine. The test for measuring MAU in urine is based on the principle that the color of an indicator changes under the influence of proteins. The MAU level was determined on the following scale: up to 10 mg / l normal (NAU), 10-30 mg / l initial increase, 30-80 mg / l average increase, 80-150 mg / l high level. To clarify the likelihood of MAU determined by albumin / creatinine ratio (ACR), ACR is the test of choice for screening microalbuminuria recommended by the American Diabetes Association. ACR is rated next on the scale - Normal - normal; Abnormal - pathology; Highabnormal-pronounced pathology.

Renal function is measured by the glomerular filtration rate (GFR). GFR calculation is mandatory. The most rational and reliable way to determine GFR is its automatic calculation in biochemical laboratories, which should produce two results - serum creatinine concentration and calculated GFR. We calculated GFR according to the CKD-EPI method, taking into account the serum creatinine level, race, gender and age of the patient.

The obtained data were processed by the method of nonparametric statistics using a computer program. Correlations with $p < 0.05$ were considered statistically significant.

RESULTS

The results of our survey showed the following data: The frequency of detection of NAU (up to 10 mg / l) was 27.7%, but of which 11.2%, the ACR was assessed as a deviation from the norm - Abnormal. The initial increase in MAU (10-30 mg / l) was found in 47%, the average increase (30-80 mg / l) was 21.8% and a high level of MAU (80-150 mg / l) in 3.5%.

The frequency of detection of MAU> 30 mg / L in men is higher (68.6%) than in women (46.6%). When analyzing the detection of frequency of MAU> 30 mg / L in different age groups, the data obtained showed that in older people (<60 years) MAU was more common (40.6%) than in middle (29.8%) and young (13.8%) age groups. ($p < 0.001$)

According to the results of the survey, the most common risk factors for CKD were studied. The role of arterial hypertension and

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ischemic heart disease as one of the most important risk factors for the development and progression of CKD is well known.

In this study, the occurrence of this factor was 53.6% and 18.3%. The most sensitive predictors were a history of proteinuria and abuse of analgesics and non-steroidal anti-inflammatory drugs (NSAIDs) (44.8% and 34.2%). The detection rate of MAU> 30 mg / l in persons with hypertension was 67.6%, in persons with coronary artery disease and diabetes - 52.7% and 83.5%. In women with a history of proteinuria (especially in women, nephropathy during pregnancy) MAU> 30 mg / l was found in 58.7%. MAU> 30 mg / L associated with the abuse of analgesics and NSAIDs was 47.4%. (P <0.01)

The detection rate of MAU> 30 mg / L in persons with normal BMI was 22.3%, with overweight (BMI> 25) - 49.8%. (p <0.01)

Among the examined individuals, CKD was detected in 28.7% (91 people). The distribution by stages of CKD was as follows: 1st stage. - 4.4%, 2 tbsp. -84.6%, 3 st. -11%. (P <0.001). 4 and 5 Art. not found.

To assess the role of proteinuria / microalbuminuria as a risk factor in the development of CKD, we assigned patients on a microalbuminuria scale and analyzed the frequency of CKD stage and associated risk factors.

At the same time, a high level of MAU (80-150 mg / l) was found in 11 people, of which 45.5% had CKD grade 3, 54.5% had grade 2 CKD. CKD. An average increase in MAU (30-80 mg / l) was detected in 69 people, among them grade 3 CKD - 7.2%, grade 2 - 43.4%, grade 1. -1.4%. The initial increase in MAU (10-30 mg / l) was detected in 149 people, among them CKD grade 3 - 1.3%, grade 2 - 23.5%, grade 1. -3.4% (p <0.01).

DISCUSSION

In the course of our studies, we established a connection between chronic kidney disease and general population characteristics - gender and age. Numerous studies indicate that CRF progresses faster in men than in women. In our cases, this was also proved by the fact that pronounced MAU (<150mg / l) and 3 degrees of CKD was more revealed among men - 54.5% and 76.9%.

Old age is also one of the risk factors for the development of CKD. The prevalence of MAU and CKD, according to the results of our study, increased with age. Our data confirm the results of previous studies that old age is one of the leading risk factors for CKD.

The most numerous was the group of those examined with risk factors for the development of CKD, such as arterial hypertension, IHD in patients and in direct relatives, increased BMI, diabetes mellitus, bad habits, mainly the use of a lot of salt and the abuse of NSAIDs. Among women in this group, a history of proteinuria (nephropathy of pregnancy) is more common. MAU> 30 mg / l in these groups was significantly more frequent.

The most common risk factors for CKD in our study were overweight (obesity) and hypercholesterolemia. There is a significant relationship between high albuminuria and overweight (obesity): 45.4% and 49.8%, respectively.

Obesity is a risk factor for the development of chronic diseases like type 2 diabetes mellitus, arterial hypertension, and coronary artery disease. In turn, these diseases are risk factors for renal pathology. [6,7] BMI analysis revealed that, among overweight individuals, the

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detection rate of MAU> 30 mg / l is 2 times higher than in individuals with normal body weight. as a risk factor for the development of CKD, was identified in 60.8% of individuals. MAU of these subjects was 46%, mostly high and medium level of increase (MAU = 80-150mg / l). This is due to the nephrotoxic effect of microalbumin as a marker of generalized endothelial dysfunction.

Analysis of the data shows that individuals with a high level of MAU revealed 3 tbsp. CKD and GFR (according to CKD-EPI)> 30-40 ml / min / 1.73 m2. AH detection rate was 90.1% (p <0.001)

Our data confirm earlier studies that severe proteinuria / microalbuminuria is a marker of the progression of CKD and in these patients the rate of development of the terminal stage of CKD develops more rapidly.

CONSCLUSIONS

Taking into account the position of screening the population for the detection of CKD, as well as the high cost and laboriousness of laboratory tests during mass examinations in population groups, it is proposed to conduct a questionnaire to identify prognostically significant risk factors.

The obtained data show the determination of MAU and GFR has a diagnostic value, it allows previously identified patients of different risk groups with CKD. The use of the UIA definition in an outpatient setting will lead to early detection and prevention of CKD.

Proteinuria / microalbuminuria, which is a predictor of CKD diagnosis, is at the same time a risk factor for the development and progression of CKD. Hypercholesterolemia worsens the prognosis of CKD. Given the close relationship between overweight with MAU and arterial hypertension, it is possible to discuss the special role of metabolic syndrome in the development and progression of CKD.

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