Diets in nephrology

Diets were a very important part of the care of patients with kidney diseases. Today their importance has slightly decreased. The kidneys are burdened mainly by excessive protein intake or by their excessive degradation. It is therefore important to keep the patient in good nutritional status, to reduce the demands on kidney function and to contribute to the regulation of the internal environment. Associated diseases that accompany kidney diseases, such as diabetes and bone diseases, also need to be treated.

When the ability of the kidneys to filter blood and drain waste products is reduced, protein intake is also reduced. This principle of treatment is detailed in the article about special diabetes diets. Today, it is used only for less severe degrees of this disability. At the beginning of the dialysis program, the diet changes rapidly and becomes relatively loose.

Diets are important in the **prevention and treatment of urinary stones** (urolithiasis), which occurs in more than 10% of men and about 8% of women. Inappropriate dietary habits play a significant role in the formation of urinary tract concrements. Approximately 80% of the stones are made up of compounds with calcium, about 10% of the stones are urate (uric acid) and 10% of the so-called struvite, which is formed on the basis of infection. The most important dietary measure for urinary stones is adequate fluid intake. Excessive animal protein intake, excessive salt intake, high calcium intake often in combination with vitamin D overdose, high oxalate intake and high uric acid exposure, e.g. in reduction diets, also contribute to the formation of concrements.

Restriction of oxalate-containing leafy vegetables is only relevant for existing oxalate concrements. Preventive importance is small. Limiting calcium intake, such as removing dairy products and milk from the diet, is also irrelevant. The commonly recommended calcium intake of around 1 g/day should not be limited while suffering from urinary stones.

The confirmation or refutation of the favorable importance of the **low-protein diet** was considered that serious that a prospective, government-funded, and very well-designed study addressing this issue was made in the USA (the MDRD study - Modified Diet Renal Disease study).

- ***MDRD study***

The results of the MDRD study were published in 1994 in the New England Journal of Medicine and were supplemented in the following years by more detailed analysis (meta-analysis). It can be stated that the MDRD study provided some evidence that a low-protein diet slows the progression of renal function impairment, although this evidence is not entirely clear and is based mainly on the meta-analysis data (incorporating Mitch's observation of the needed time lag for applying the positive effect of the low-protein diet on progression of the renal function impairment). However, at the same time, the study pointed out that malnutrition could be a possible negative consequence of dietary protein restriction. Therefore, according to current knowledge, there are pros and cons of establishing the low-protein diet in patients with impaired renal function.

Renal failure is manifesting by the accumulation of nitrogen substances in the blood. Nowadays, at an advanced stage, it is treated by dialysis (an artificial kidney). As noted above, at lower levels of renal filtration impairment, it has been customary to limit nitrogen (protein) intake. The results of many studies in this area show that this is still an important procedure (see in detail in the heading of the special diabetes diets). Although it is important that if this measure is taken, it should not lead to malnutrition. It is a mistake when a patient with dialysis treatment is malnourished, e.g. a patient with a reduced blood protein. Therefore, it is required for the patient whose protein intake is reduced according to the tables (see special diabetes diets) should be monitored and their weight loss or signs of malnutrition should be detected in a timely manner. The energy supply should also be sufficient. However, it is definitely true that protein restriction makes sense because it can maintain kidney function and delay treatment with an artificial kidney.

Reducing protein intake also helps to reduce phosphorus intake. Protein is the main source of phosphorus: 1 g of protein contains over 10 mg of phosphates. The problem of high phosphate levels is common in patients with renal failure. Today, it can also be solved by prescribing drugs that bind phosphate in the intestine. High levels of phosphate cause hyperfunction of the parathyroid glands, which produce the so-called parathyroid hormone, which makes severe bone damage (renal osteodystrophy) in patients with renal problems. High phosphate levels are also present because the kidneys do not metabolize vitamin D sufficiently. Thus, it is usually necessary to administer vitamin D in a form that no longer needs hydroxylation in the kidney. Another problem in patients with advanced kidney disease is high level of potassium. In this situation, it is necessary to limit the supply of fruits and vegetables. It is also possible to take into account the potassium content in individual foods according to the table on an unsalted diet, see the hypotension and hypertension diet.

It should be emphasized that there are also kidney diseases in which potassium deficiency occurs. In this case, it is appropriate to increase the intake. However, this should be decided in consultation with a physician or nutritionist.

Dietary treatment in dialysis (artificial kidney treatment) is very individual and goes beyond the scope of this publication. The patient should consult his dietary status individually at the dialysis center.

References

Related articles

- Dietotherapy

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- SVAČINA, Štěpán. *Dietologie a klinická výživa* [online]. [cit. 2012-03-14]. <https://el.lf1.cuni.cz/p66466615/>.