

Functional examination of the kidneys

Examination of glomerular filtration

 For more information see *Glomerular filtration test*.

Examination of serum creatinine concentration

- Norm: 50–100 µmol/l.
- When kidney function is impaired, the serum concentration of creatinine increases.
- In some patients, even with impaired kidney function, the serum creatinine concentration may be within the reference limits - it depends on the production of creatinine by the skeletal muscle.
- Clearance of creatinine C_{kr} :

C_{kr} expresses how the plasma is purified from the monitored substance;

$$C_{kr} = \frac{U \cdot V}{P}$$

U = concentration of substance in urine, V = volume of urine per time unit, P = concentration of substance in plasma;

- normal values: 1.5 to 2.2 ml/s;
- depends on age, gender and weight.
- Accurate collection of urine after 24 hours is necessary.

Examination of renal tubular function

Examination of the concentration ability of the kidneys

- We find out the ability of the kidneys to create concentrated urine.
- We monitor urine osmolality. (in a healthy person; osmolality = 600–800 mmol/kg H₂O = 500–1200 mOs/kg; without fluid intake = 1200–1400 mOs/kg).
- This ability is often impaired already at the beginning of kidney disease.

Concentration test - by thirst

- For 36 hours, the patient must not drink or eat food with a large amount of water.
- After 12 hours, urine is collected at 4-hour intervals, we determine density and osmolality.
- Before the last sample, we will take blood - concentration index.
- We will stop when it reaches the limit given for a certain age.

Adiuretin test

- It is much gentler, does not burden the patient as much.
- After a dinner without liquids, when the examinee no longer drinks in the evening, we apply ADH into the nose in the morning (he must not have a cold).
- Concentration disorders - mainly in diseases of the tubules and interstitium, in case of a violation of the gradient.

Investigating dilution functions

- We monitor how the patient reacts to increased water intake:
 - In a healthy person, there will be an increase in urine volume, a decrease in ADH production, and thus an increased diuresis and a decrease in osmolality.
 - ADH secretion increases in patients with kidney failure.
- This method is important in the investigation of water metabolism disorders.

Links

Related Articles

- Urine examination
- Glomerular filtration test

- Clearance

References

- SCHNEIDERKA, Peter. *Chapters in Clinical Biochemistry*. 2. edition. Prague : Karolinum, 2004. ISBN 80-246-0678-X.