

# Tubulointerstitial nephritis

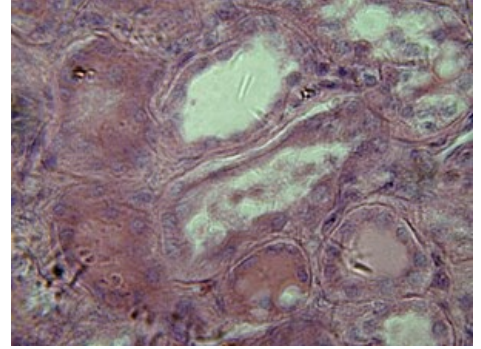
Tubulointerstitial nephritis (TIN) is an inflammatory disease that primarily affects the renal tubules and / or the renal interstitium. Glomeruli are often affected as a result of tubule involvement.

- Pyelonephritis - an older collective name, but rather refers only to nephritis, in which the infectious agent is clearly involved (which is definitely not the case for all TINs).

## Characteristics of TIN

Manifestations of the disease include:

- proteinuria various degrees,
- erythrocyturia (usually non-glomerular),
- leukocyturia (in bacterial or where the infection is secondary),
- dysuria



chronic nephritis

## Acute TIN

Acute tubulointerstitial nephritis (TIN) includes acute bacterial TIN and acute hypersensitivity TIN (as well as parainfectious and idiopathic TIN). These diseases usually involve the renal tubules and interstitium. Typical manifestations of the disease are proteinuria of varying severity and non-glomerular erythrocyturia.

### Acute bacterial TIN

Acute TINs often arise from ascending urinary tract infections . There may be certain predispositions for the development of this disease , which facilitate the development of these infections:

- congenital predispositions - developmental anomalies (double renal pelvis), vesicoureteral reflux (VUR);
- acquired predispositions - lithiasis (urinary stones), prostatic hypertrophy , ureteral stenosis (for example, oppression from the environment).

Typical manifestations of this disease include:

- systemic manifestations - weakness, febrile;
- lumbar pain;
- physically often positive tapottement;
- dysuric disorders;
- maybe oligouria is also possible .

### Examination

#### ■ Physical examination :

1. shortness of breath, sweating, febrile illness, often accompanied by chills
2. active occupation of the relief position
3. positive tapottement

#### ■ Examination of urine and urinary sediment belongs to the basic:

1. leukocyturia - always,
2. bacteriuria - should also always be present, if the detection of bacteria fails, the possibility of TB infection must be considered ,
3. non-glomerular erythrocyturia,
4. proteinuria  $< 2 \text{ g} / 24 \text{ hrs}$ .

- **Blood tests** - leukocytosis, increased CRP and sedimentation,
- **Culture testing** should always be performed, due to sensitivity to ATB treatment, typical agents are *E. coli* , *Klebsiella pneumoniae* , if it fails to cultivate, TB infection must be considered .
- **Ultrasound** - A typical picture for acute bacterial TIN is the mapped appearance of the kidney.
- **Kidney biopsy** is not indicated.

### Therapy

Acute bacterial TIN is one of the diseases that can be treated on an outpatient basis, but it is appropriate to consider hospitalization.

- ATB therapy,

1. untargeted empirical,
2. targeted - based on the results of culture tests for ATB sensitivity.

The preparations used include cephalosporins , aminoglycosides and fluoroquinolones (common resistance). The required duration of ATB therapy is at **least 2 weeks** . It should be borne in mind that one of the side effects of antibiotic use is the risk of renal insufficiency (furosemide, which is also nephrotoxic, should never be given at the same time as ATB treatment and the combination of drugs could lead to irreversible kidney damage).

## Acute hypersensitivity TIN

This is a type of drug allergy. A history of drug use (ATB, NSAID) is typical , followed by a latency period (up to 6 weeks), after which symptoms develop. The dose or duration of medication use does not affect the development of the disease .

- Symptoms:

1. febrile,
2. skin changes,
3. arthralgia,
4. (dysuric problems are not, because the condition is not caused by infection).

## Examination

- **Urine examination** :

1. non-glomerular erythrocyturia,
2. eosinophuria,
3. proteinuria of varying extent (<2 g / 24 h to nephrotic syndrome ).

- **Blood test** - eosinophilia is typical.
- **Sonography** - normal image of the kidneys.
- **Biopsy** - granulomas.

## Therapy

Therapy consists of removing the allergen. If this alone is not sufficient, corticosteroids are given

## Chronic TIN

\_\_Chronické tubulointersticiální nefritidy

Chronic tubulointerstitial nephritis mainly includes chronic bacterial TIN, analgesic nephropathy and reflux nephropathy. Typical manifestations of the disease include leukocyturia and bacteriuria (in infectious), erythrocyturia (non-glomerular origin), proteinuria of various extents.

## Chronic bacterial TIN

Patients usually have one of the predispositions (congenital - double pelvis, or acquired - lithiasis , prostatic hypertrophy), a history of recurrent episodes of acute bacterial TIN with asymptomatic interludes.

## Symptoms

- **urine examination** ,

1. bacteriuria is usually present, if no pathogen can be cultured from the urine and leukocyturia is present, the possibility of TB must be considered ,
  2. leukocyturia is always present,
  3. non-glomerular erythrocyturia,
  4. proteinuria - usually small,
- **sono** - typical post - inflammatory changes not only of the kidneys (possible abscesses or their remains), but also of the excretory system.

## Therapy

- ATB therapy in acute exacerbations (as in acute TIN, empirically, then according to the results of cultivation),
- in very frequent exacerbations, a preventive nocturnal dose of ATB is used even in asymptomatic periods.

## Reflux nephropathy

It occurs in patients who suffer from vesicoureteral reflux (VUR, a congenital ureteral defect that leads to urinary reflux from the bladder to the ureter). This is the basis for recurrent urinary tract infections. It most often occurs in children, in general, the younger the recurring urinary tract infections, the more likely it is that it is based on VUR. Untreated VUR III.-IV. degree leads to reflux nephropathy with frequent relapses. There is a risk of focal segmental glomerulosclerosis, hypertension and, ultimately, renal failure.

## Symptoms

- frequent history of urinary tract infections or evidence of VUR,
  - enuresis (nocturnal enuresis) in children older than 5 years,
  - **urine examination** ,
1. bacteriuria,
  2. leukocyturia,
  3. non-glomerular erythrocyturia,
  4. nephrotic proteinuria (more than 4 g of protein in the urine per day, very difficult to find, especially in a child),
- **micturition cystography** ,
  - **scintigraphic examination** .

## Therapy

- ATB therapy in exacerbations,
- VUR treatment (surgical) ,
- treatment of nephrotic syndrome (therapy of significant proteinuria, possible swelling, hypertension and dyslipidemia).

## Analgesic nephropathy

Analgesic nephropathy is the result of many years of abuse of the analgesic Phenacetin (an older analgesic, used about 30 years ago, is no longer used today). Thus, a typical patient is elderly with a history of Phenacetin use (e.g., for rheumatic diseases or other conditions characterized by pain).

## Renal manifestations

- wide range of speeches:
1. an asymptomatic course is also possible,
  2. hematuria ,
  3. renal colic ,
  4. renal failure ,
  5. hypertension (as a consequence of renal impairment).

## Other consequences

- increased risk of developing transitional epithelial carcinoma,
- other manifestationme (psychosomatic, bone, cardiovascular, hematological and gastrointestinal disorders).

## TIN classification

Tubulointerstitial nephritis can be classified according to the rate of onset, course, reversibility, etiology and others. The most common classification is according to the rate of onset of acute and chronic.

Classification of tubulointerstitial nephritis	
Acute tubulointerstitial nephritis	Chronic tubulointerstitial nephritis
<ul style="list-style-type: none"><li>▪ acute bacterial TIN,</li><li>▪ acute hypersensitivity TIN (drug, especially ATB, NSAID),</li><li>▪ parainfectious TIN,</li><li>▪ idiopathic TIN.</li></ul>	<ul style="list-style-type: none"><li>▪ chronic bacterial TIN,</li><li>▪ analgesic nephropathy,</li><li>▪ reflux nephropathy,</li><li>▪ drug nephropathy,</li><li>▪ Li and heavy metal poisoning,</li><li>▪ post-radiation nephropathy,</li><li>▪ nephropathy in systemic diseases (only glomerulonephritis may not occur in SLE or RA),</li><li>▪ nephropathy in malignant diseases,</li><li>▪ metabolic nephropathy,</li><li>▪ endemic Balkan nephropathy.</li></ul>

## References

## Related articles

- Vesicoureteral reflux
- urine examination
- glomerulonephritis

## References

- CZECH, Richard, et al. *Internal*. 1st edition. Prague: Triton, 2010. 855 pp. 546-547. ISBN 978-80-7387-423-0 .
- ČERTÍKOVÁ-CHÁBOVÁ, Věra. *Tubulointerstitial nephritis* [lecture on the subject Nephrology, General Medicine, 1st Faculty of Medicine Charles University]. Prague. 1/4/2011
- \* ws: Tubulointersticiální nefritidy
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## External links

<https://portal.lf1.cuni.cz/clanek-618-tubulointerstitialni-nefritidy>

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