Urinary tract infection

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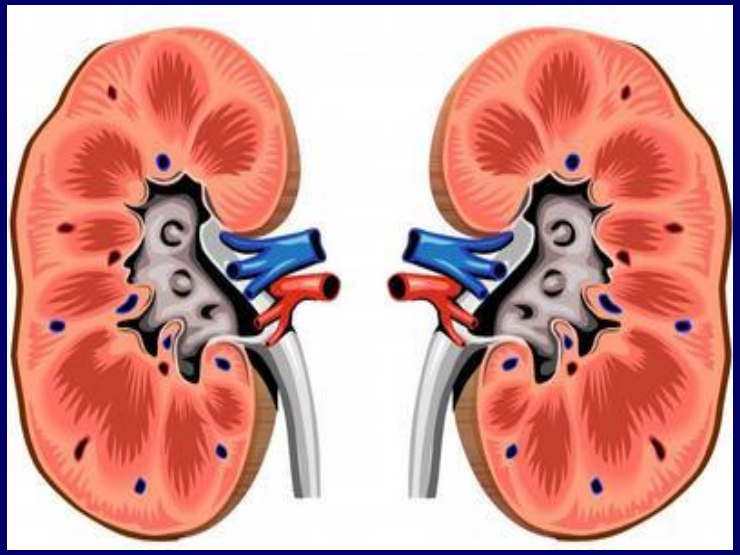


UTI

Under normal conditions is urine sterile

Nomenclature

- **UTI** = basic nomenclature/name
- **Bacteriuria** = bacteria in urine
- **Significant/high-level bacteriuria** =

  > 10^4/ml (midstream urine sample, boys)

  > 10^{4-5}/ml (midstream urine sample, girls)
- **Acute pyelonephritis** = UTI in upper part, incl. kidney

- **Acute cystitis** = UTI in lower part ~ bladder, urethra

UTI

UTI = significant bakteriuria !!!

UTI is not - leukocyturia

- dysuria

- proteinuria

- hematuria

UTI

- the most common (the second or third place among other diseases)
- usually is the first episode of UTI during neonatal period (↑ boys)
- the first episode is usually serious/severe

UTI

UTI– Why? or Way of spread?

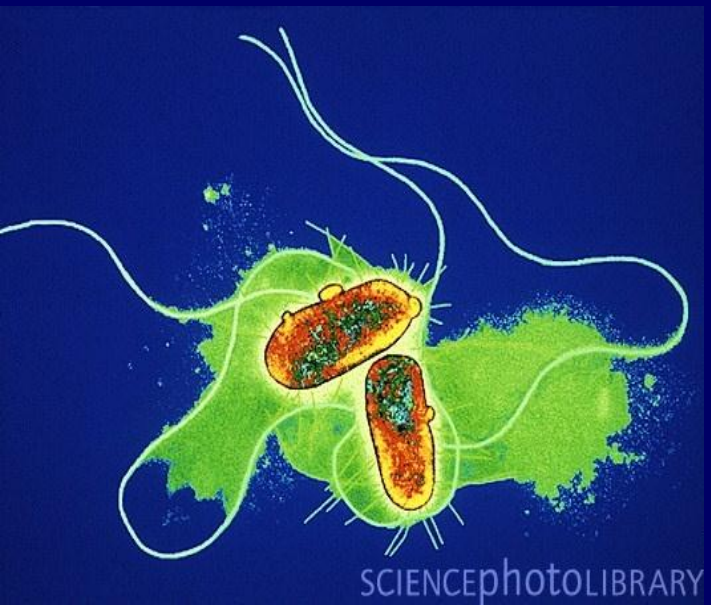
- Hematogenous = sepsis or local infection
- Ascending = genital, anal

UTI

UTI – dominant pathogen

➔Bacteria (E. coli) – fimbrie

- protective factors for better adherence on mucous membrane
- endotoxins



UTI

UTI - etiology

Bacteria– Proteus, Klebsiella

Pseudomonas

Staphylococcus (epidermal, aureus)

Streptococcus

Mycotic infection – Candida

Viruses – Herpes, Adenoviruses

- **95% UTI is due one pathogen only**

(2 or 3 pathogens in urine are unusual !!!)

UTI

UTI – some risk factors for origin of UTI

- female
- uncircumcised male
- VUR
- bed toilet training
- voiding dysfunction
- obstructive uropathy (posterior urethral valve, urethral stenosis, hydronephrosis…)
- neuropathic bladder
- abnormal sexual activity (non-safe sex, promiscuity, anal sex)
- urethral instrumentation

UTI

UTI – for clinical practice is very importatn

differentation site of UTI

UPPER and LOWER part of urinary tract

UTI

Acute pyelonephritis

Symptoms: fatigue, fever, shakes, anorexia, abdominal or flank pain

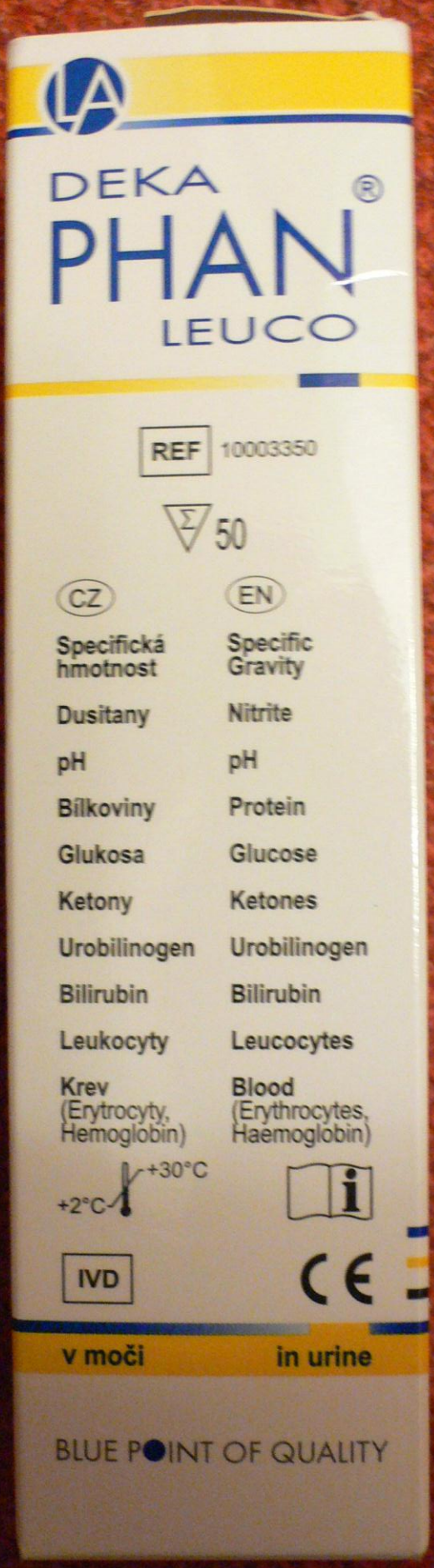
Attention! – neonates/infants usually have abnormal symptoms (diarrhoe, vomiting, crying…)

Laboratory: ► ↑↑ C-reactive protein, ↑ ESR, leukocytosis ~ shift to the left

► urine ~ urinalysis by dipstick (Le, nitrites)

► bacterial exam

important is ultrasonography (enlarge kidneys, absent corticomedullary deferentation)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Glukosa
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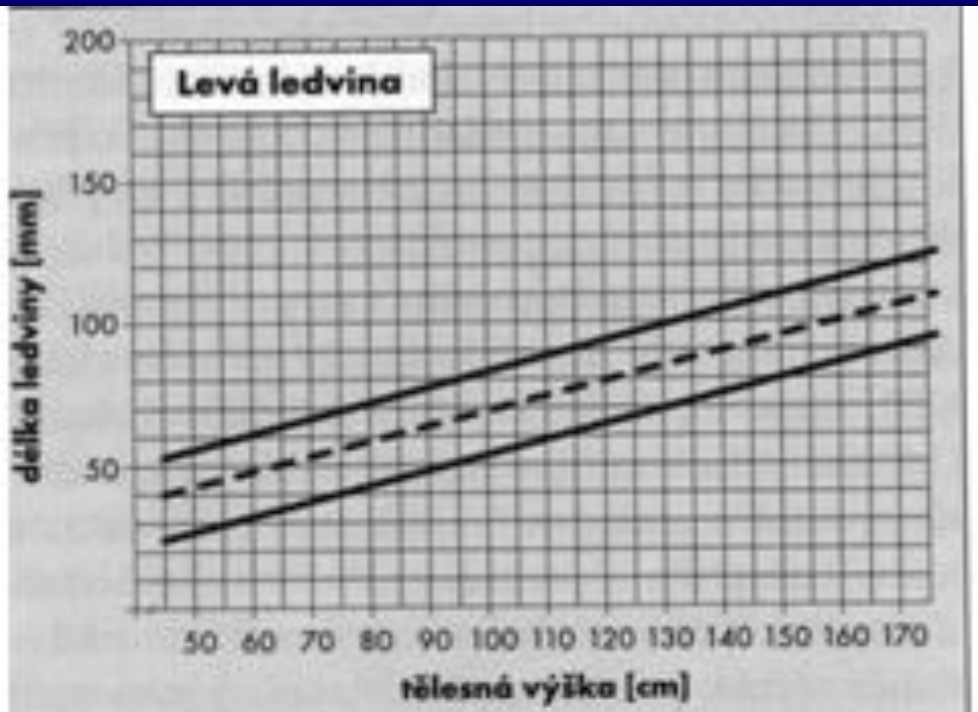
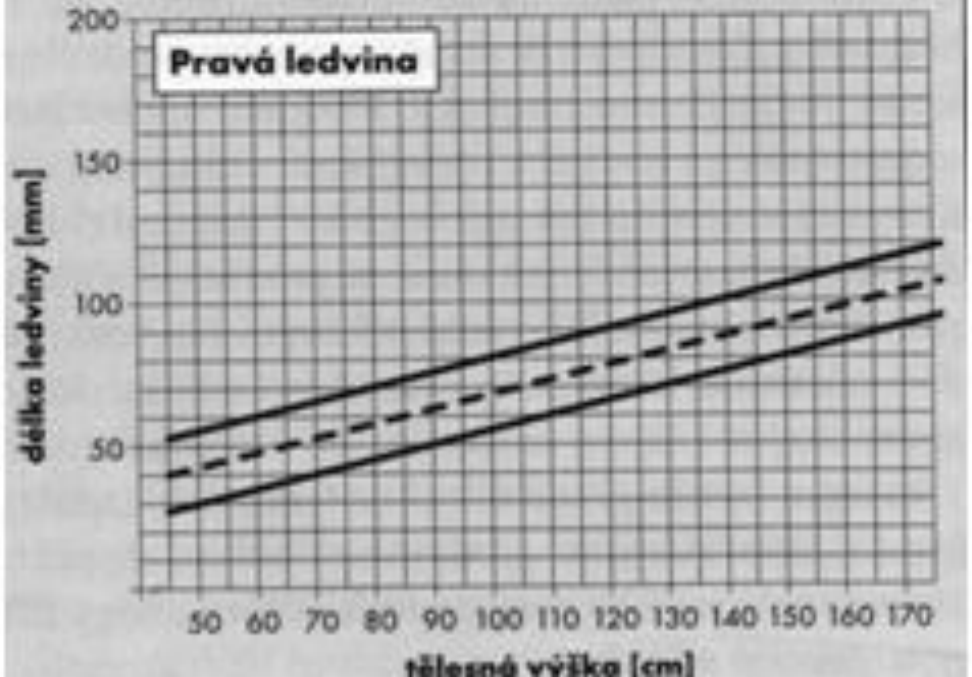
Ketony
Ketones
Urobilinogen
Urobilinogen
Bilirubin
Bilirubin
Leukocyty
Leucocytes
Krev (Erytrocyty, Hemoglobin)
Blood (Erythrocytes, Haemoglobin)
+2°C
+30°C
IVD
CE
v moči
in urine
BLUE POINT OF QUALITY

Standard graphs by Dinkel- for analyse of size of kidneys on ultrasound





UTI

Acute cystitis

Symptoms: subfebrile, anorexia,
suprapubic pain, dysuria

Attention !- neonates/infants have usually abnormal symptoms (diarrhoe, crying, vomiting…)

Laboratory:
- ► C-reactive protein, ESR, leukocytosis,
- ► urinalysis – dipsticks (Le, nitrites)
- ► bacterial exam

ultrasonography (thickened/edematous wall of bladder)

UTI – to obtain a urine sample

!!! cleaning of genitalia

Positive result

➔ **Midstream urine sample - boys > 10^4/ml**

- girls > 10^5/ml

➔ **Catheterization of bladder - > 10^5/ml**

➔ **Bladder punction - any bacteria**

UTI

Obtain of urine sample – clinical practice

- adhesive sterile collection bag
- sterile test-tube
- sterile dip-slide method

Dip-slide method

UTI - therapy

Acute pyelonephritis –

- Antibiotics – aminopenicilins, cephalosporins II/III generation

preference i.v.

by good answer (symptoms, fever, C-reactive protein, ESR) is possible switch to per os

antibotics - duration is usually 10 days

UTI

Acute pyelonephritis –

- after 3-6 months from acute period is important static scintigraphy (DMSA scan); to detect renal scar

some guidelines indicate voiding cystography after 4-6 weeks from acute pyelonephritis (to detect of VUR)

➔ by reccurence of UTI (2 episode) is voiding cystography necessary

UTI

Acute cystitis –

- chemotherapy (Biseptol, Furantoin)
  analgetics/spasmolytics
- high fluids intake, local warm to suprapubic

- girls → gynecology exam
  (reccurence of cystitis is in adolescent girls with intrauterine contraception/coil)

UTI

- Probiotics/prebiotics

- Cranberry juice/capsule

Thank you for your attention