

## **Urological cases in doctor cabinet**

In order of frequency

- Urinary tract infections
- Prostate disorders
- Urinary lithiasis

### **Urinary tract infections**

- Significant bacilli
- Over  $10^5$  germs / ml

Symptoms plus

- $10^2$  germs / ml in women
- $10^3$  germs / ml in men
- = possible infection

Catheterization plus

- $10^2$  germs / ml
- = infection

Differential diagnosis of UTI

- Acute
- Chronicles
- Of high urinary tract
  - Pyelonephritis
  - Intrarenal abscesses
  - Perinephritic abscesses
- Of low urinary tract
  - Urethritis
  - Cystitis
  - Prostatitis
- Differential diagnosis of UTI
- Acute urethral syndrome = dysuria without significant bacteriuria
- Differential diagnosis of UTI
- Developed in a
  - Normal urinary tract (UTI without complications)
  - Urinary tract with functional or anatomical abnormalities
- Differential diagnosis of a series of UTIs
- Recurrent urinary tract infection
  - 3 episodes in a year
  - 2 episodes in 6 months
- Recurrent urinary tract infection
  - The same agent microbial in within 2 weeks of stopping therapy
- Reinfection
  - Identification of a new strain compared to the previous one

## Etiology

- The most common
- Gram negative bacilli
- 80%
- E.coli
- Other bacillus gram negative Proteus, Klebsiella, Enterobacter, Pseudomonas
- Gram- negative coocs
- Staphylococcus aprophyticus
- 10-15% in young women
- Negative urine cultures
  - Chlamydia
  - Neisseria gonorrhoe
  - Herpes simplex virus

## Pathogenesis

- The ascending path
  - 90%
  - Initially periurethral colonization with intestinal flora
- Hematogenous pathway
  - Primary foci of infection with Staphylococcus aureus, Candida, Salmonella
- Lymphatic pathway ( peritonitis )

## Mechanisms of defense of the host

- Normal urinary flow
- Normal bladder evacuation
- Mechanisms of inhibition of bacterial adhesion ( Tamm-Horsfall protein , etc.)
- Urine composition
  - Hyperosmolarity
  - acid pH
  - Absence of glucose
- Mucus secretion ( bactericidal effect )
- Normal peristalsis of the ureter

## Favouring factors of UTI

- Gender ( female )
- Age ( over 60 years men = women )
- Pregnancy
- General chronic diseases
  - Diabetes
  - Liver cirrhosis
  - hypertension
  - Multiple Sclerosis
  - Spinal cord injuries
  - Stroke

- Kidney disease
  - Lithium
  - Adenoma of the prostate
  - Urethral strictures
  - Glomerulonephritis
  - Bladder- ureteral reflux
- Urological maneuvers

#### Diagnosis

- Symptoms
- Dysuria
- Pollakiuria
- Urgent urination
- Suprapubic pain
- Turbid urine

Analysis useful for the supposed diagnosis positive without confirmation of this agent microbial

- Dipsticks
- Nitrites
- Increases the probability of infection by 5 x
- Leukocyte esterase
  - Increases the probability of infection by 1.5 x
- Together they increase the probability of infection 7 times

#### Interfering

- Urine in the refrigerator (10 degrees C ) for more than 24 hours
- = multiplication of bacteria = false positive result for nitrites
- Urine at room temperature over 2 hours
- = leukocytolysis = false negative result for the presence of leukocytes in the urine

#### Cystic syndrome + alkaline pH

- = urease-forming germs (Proteus)
- or kidney stones

#### Uroculture - Indications

- Persistence of cystic syndrome more than 7 days of antibiotic therapy
- Women with symptoms of high UTI
- Recurrent ITU
- Pregnant
- Any ITU in men
- Any ITU in children
- Coexistence of favorable factors

#### Asymptomatic bacteriuria

- The most common
- E.Coli
- Klebsiella, etc

Asymptomatic bacteriuria - def.

- In men : a single determination
- In women : 2 cultures with the same germ

Asymptomatic bacteriuria - treatment

- NO
- Exception
  - Pregnant
  - Instrumental interventions

Urethritis

- Pain
- Pollakiuria
- No significant bacteriuria
- Urethritis
  - Gonococcal
  - Nonspecific : Chlamydia, etc.
- Urethritis - treatment
- Ceftriaxone 500 mg IM dose only
- + Azithromycin 1 g single dose
- Chinolone
  - Represents an alternative
  - Pay attention to bacterial resistance
  - Do not administer to pregnant women and to children under 18 years

Cystitis

- Dysuria
- Pollakiuria
- + suprapubic pain
- Turbid and foul- smelling urine
- Red blood cells in 30% of cases

Factors that favour uncomplicated cystitis

- Sexual activity
- Urinary incontinence
- Faecal incontinence or constipation
- Spermicide
- Decreased estrogen levels
- Resistant to ATB
- Dehydration
- Diabetes

UTI - treatment principles

- Uncomplicated low UTI in women
  - 1 day
  - 3 days
  - 7 days
- No control urine culture
- Identification and correction of favourable factors

- In the child
  - The rate of recovery = 50%
- Control urine culture
  - 4 in the first year
  - 2/3 per year for the next 2-3 years
- Asymptomatic bacteriuria in pregnant women
  - Needs treatment
  - Risk of acute pyelonephritis

#### Low ITU

- Single dose
  - Increased compliance
  - Efficiency may be low
  - Cotrimoxazole 4 cp
  - Amoxicillin 3 g (6 cp)
  - Ciprofloxacin 500 mg
  - Norfloxacin 800 mg
- 3 days
  - Reduced side effects
  - Efficiency may be higher
  - Cotrimoxazole 2 x 1 cp / day (2x 480 mg)
  - Amoxicillin 3 x 500 mg / day
  - Amoxi + clavulanic acid 2 x 1 g / day
  - Norfloxacin 2 x 400 mg / day
  - Cefuroxim 2 x 500 mg / day
- Pregnant
  - 7 days
  - Amoxi
  - Ampi
  - Cefalo
- Women with acute ureteral sdr
  - Negative cultures
  - Chlamydia
  - Doxycycline 2 x 100 mg / day , 7 days
- Recurrent urinary tract infections
  - ½ tb cotrimoxazole 3 x / week
  - 6-12 months

#### Removal of favourable causes

- The most common
- Kidney stones

#### Postcoital prophylaxis

- Nitrofurantoin 50 mg
- Trimethoprim 100 mg

## **Acute pyelonephritis**

- Sudden onset
- Fever
- Low back pain
- Nausea , vomiting
  
- Leukocytosis with neutrophilia
- Leukocyturia
- Leukocyte cylinders
- Microscopic hematuria
- Proteinuria in small quantities
- Positive urine cultures
- No nitrogen retention
  
- Paraclinic
  - Ultrasound
  - Radiology
  - Asymmetric renal atrophy
  - Impaired kidney function
  
- Acute pyelonephritis - treatment
- Where ?
  - Ambulatory
    - ? Improve in 48-72 hours
    - Injectable
    - Cephalosporins of Generation III
    - Aminoglycosides
    - After 24-48 hours of afebrility :
      - Oral
      - Amoxi
      - Cyprus
      - Cephalopod
- How long ?
  - 2 weeks

## **Urinary lithiasis**

- Epidemiology
    - Up to 50 years: 4 x more common in men
    - After 50 years: equal incidents
- Lithiasis formation is influenced by
- factors of environment
    - Humidity
    - Temperatures increased
  - nutrition habits
    - increased intake of sodium
    - increased intake of protein
    - reduced liquid intake
  - Genetic factors
    - Cystinuria
    - acidosis renal tubular distal

#### Lithiasis ( frequency )

- salts of calcium 75-85%
- Salts of struvite 10-15%
- Uric acid lithiasis 7-8%
- cystine

#### Calcic nephrolithiasis

- It is often familial
- 60% of patients will present a renal colic in the next 10 years
- Frequent : mixed composition ; oxalofosfatocalcici
- Radiopaque
- Oxalic stones : small , hard and " angular " = painful
- phosphate stones: corral-like , brittle

#### Disorders of absorption

- Increased absorption of intestinal of calcium

#### Disorders of reabsorption

- Secondary to hyperparathyroidism

#### Kidney disease

- tubule kidney stones do not absorb effectively calcium filtered at the glomerulus

#### Stones of struvite

- Ammonia-magnesium phosphate
- Radiopaque
- Frequent in women secondary  
to infections with urease - producing bacteria (Proteus)
- Hard consistency
- They are secondary to prolonged treatment with Atb for infections with
  - Proteus
  - Psedomonas
  - Klebsiella
  - Staphylococci
  - Mycoplasma

#### Uric nephrolithiasis

- More common in men
- Radio-transparent calculations
- Gout is frequently associated

#### Clinical picture

- Asymptomatic
- Polymorphic symptoms
- Renal colic

#### Renal colic

- Patient agitated , in analgesic position
- Pain with sudden onset
- Located in the flanks

- radiates above or on the tract ureter , to organs genitals external
- Associate nausea and vomiting
- Feeling of micturition urge with urinary frequency = calculation inclavat at the junction uretero- bladder

#### Objective examination

- Positive Giordano
- Points painful kidney
  - Costovertebral
  - Costomuscular
- Urethral pain points
  - Superior - the intersection muscles straight abdomen with horizontal that passes through the navel
  - East - to intersection muscles straight abdominal the line biiliaca
  - Lower - accessible pelvic print
- The intensity of the pain does not correlate with the dimensions of the calculation

#### Investigation of laboratory

- Interesting
  - Examination summary of urine
  - Urinary sediment
- Availability in the FM office
- Dipstick
  - Urinary pH
  - Hematuria
  - This leukocytes and of nitrates ( require treatment of the emergency of infection )

#### Hematuria

- In general: microscopic hematuria
- 10% of cases : macroscopic hematuria
- Absence of hematuria : does not exclude stones

#### pH

- Under 5
  - uric nephrolithiasis
  - Cystine lithiasis ( cystinuria ) - Rx-transp.
- Over 7.5
  - Structural stones ( urinary tract infection )

#### Evaluation of the laboratory (in case of colic kidney or gallstones asymptomatic )

- Blood
  - Serum calcium
  - Serum phosphate
  - Electrolytes
  - Uric acid
  - PTH
- Urine collected in 24 hours
  - Volume



- Density
- pH
- Calcium and phosphates
- Urate or urinary citrate

#### Imaging

- Ultrasound
- Evaluate calculations
  - Locate calculations
  - View calculi Rx- opaque and transp.
- Evaluates the response of the urinary tract
  - Ureterohydronephrosis
  - The thickness of the renal parenchyma

#### Chemical analysis

- After spontaneous or interventional elimination
- Necessary for prophylactic treatment

#### Differential diagnosis

- Pain lumbar
  - Disc herniation
  - Spondylosis
  - Spondylitis
  - Biliary colic
  - Pancreatitis
- Pain excluded lumbar
  - Colic appendicular
  - Disease inflammatory pelvic
- Hematuria
  - Neoplasms benign or malignant
  - Renal cysts
  - Renal tuberculosis

#### Complications

- Ureterohydronephrosis
- Obstructive nephropathy +/- renal insufficiency
- Calculus anuria
- acute and chronic pyelonephritis
- Renal abscess
- Recurrence
  - recurrence rate at 5 years = 50%

#### Prognosis

- Depends on
- Degree of obstruction
- The size and location of the lithiasis
- Number and bilaterality of calculations
- Type of lithiasis

### Prognosis

- Well tolerated calculations :
  - Calyx stones
  - Corral-like stones
  - Nephrolithiasis after the age of 50 years

### Evolution

- Slow - for disease chronic of kidney

### Prophylactic treatment

- Increased water intake
- An optimal amount is not set
- It is recommended to double the liquids
- Supplementation can be chosen
  - during meals
  - At 2 hours after meal ( when the body has the most pronounced state of dehydration )
  - Before the bed ( urination in during the night = Wake + intake of liquids )

### Treatment - calcium lithiasis

- Solving situations that decrease urinary citrate ( increases the level of urinary Ca )
  - extended fasting
  - Prolonged steatorrhea
  - Hypomagnesaemia
  - Hypokalemia
- Thiazide diuretics ( watch out for hypokalemia ) - obs. NaCl in excess can reduces the therapeutic effect

### Treatment - calcium lithiasis

- Hyperparathyroidism = resection of the parathyroid adenoma

### Treatment - stones of struvite

- Percutaneous nephrolithotomy
- Postoperative renal irrigation
- Treatment of infection

### Treatment - uric stones

- Alkalization of urine
  - Citrate of potassium 10mEq / TB, TB 3 x 2 / day
- Treatment of hyperuricemia
  - Allopurinol 300 mg / day
- Alkalization of urine
  - Citrate of potassium 10mEq / TB, TB 3 x 2 / day
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  - Allopurinol 300 mg / day

### Treatment - cystic lithiasis

- Breeding intake of liquids and in during the night
- Alkalization of urine
- Hyponatraemic diet

Surgical treatment - indications

- Immobilizable stones by peristalsis
- fixed stones
- Calculations of dimensions that do not allow their spontaneous elimination
- Urethral obstruction for more than 6 weeks

Surgical treatment

- Ureteroscopy
- Extracorporeal lithotripsy ( kidney or urethral stones )
  - Anesthesia
  - No hospitalization required
  - reintervention if not eliminate gallstones in for 3 weeks
  - Contraindications : women in the fertile period at the level of the lower ureter - effect on the functional ovary
- Percutaneous nephrolithotomy ( kidney stones )

## **Hyperplasia Benign of Prostate**

Incidence

- Between 40-50 years: 20%
- Over 80 years: 80-90%

Pathogenesis

- Testicular involution ( estrogenic secretion predominates over androgenic one )
- Genetic factors
- Chronic inflammation of the prostate
- Abstinence or sexual excesses
- Pelvic venous congestion

Morphopathology

- BPH take birth in areas periurethral and mixed
- Dg diff with cancer of the prostate - origin in areas peripheral

Diagnosis

- Obstructive signs and symptoms
  - Dysuria
  - Decreased urinary flow
  - Jet urine intermittent
  - Use of abdominal muscles when urinating
  - Sensation of incomplete urination ( bladder residue )
  - Incontinence Urinary through overflow ) in phases advanced )
- Irritant signs ( bladder detrusor irritation )
  - Polakiurie
  - Nightingale , in the second half of the night
  - Feeling of urination urge
- Rectal examination
  - Size
  - Consistent
  - Middle groove ( presence or absence )

- PSA
  - NV: 1.4-4.1 ng / ml
  - 4.1-10 ng / ml: cancer suspicion
  - Over 10 ng / ml: probability of cancer
- Abdominal ultrasound
  - Prostate size and volume
  - Prostate structure
  - Homogeneous , inhomogeneous , nodules
  - Kidney damage: hydronephrosis
  - Postmictional bladder residue
- Transrectal ultrasound
  - Prostate dimensions
  - Bladder residue
  - Guides the biopsy
- The following infections can complicate BPH
  - Staphylococcus
  - Streptococcus

#### Complications

- Retention acute of urine
- Ultrasound
  - Urethral catheterization
  - Suprapubic puncture
- Haematuria
- Infection
  - Cystitis , epididymitis , pyelonephritis
  - Germ Gram Negative : E. coli , Klebsiella, Proteus
- Bladder diverticula
  - Eliminate the two -stroke
  - Cystoscopy
- Nephrolithiasis bladder
  - Eliminate painful and frequent
  - Irradiating pain in the glans
  - Urination interrupted during the movement of the stone
- kidney chronic disease

#### Treatment - drugs

- inhibitors of 5 alpha reductase
- Increase urine flow
- Reduce prostate volume
- The effects appear after 6 (3) months of treatment
- Finasteridum PROSCAR ( selective inhibitor of 5 alpha reductase type II)
- Dutasteridum AVODART (inhibitor of both isoenzymes )
- After 3-6 months
- Reduction of prostate volume by 20-30%
- PSA values decrease by half
- Secondary effects
  - Decreased libido
  - Erectile dysfunction

#### Treatment - drugs

- Alpha blocker
- Doxazosin CARDURA 1-8 mg / day
- Tamsulosin OMNIC FOKUSIN 0.4 mg / day
- Reduction of bladder residue by up to 50%
- Does not affect the volume of the prostate
- Side effects
  - Orthostatic hypotension
  - Retrograde ejaculation (tamsulosin)
- They are generally abandoned after 6-12 months

#### Treatment - surgical

- Symptoms sharp , refractory to treatment
- Complications
  - retention acute of urine
  - repeated haematuria
  - repeated urinary tract infections
  - renal failure
  - bladder stones
  - diverticula
  - important residue

#### Treatment - surgical

- Classic adenectomy ( adenomas over 80-100 ml)
- Transurethral resection
- Etc.

### **Prostate cancer**

#### Increased risk

- Vasectomy
- Improperly treated prostatitis
- Viral infections (herpes, papilloma virus)

#### Clinic

- Obstructive urinary signs
- Haematuria
- Hemospermia
- Painful erections
- Hypogastric pain

#### Risk of cancer

- DNA sequence on chromosome 8

#### PSA

- In people over 60 years: under 4.1 ng / dl
- 50-60 years: less than 3 ng / dl
- Youth : less than 2.5 ng / dl

PSA 4.1-10 ng / ml

- 10-25% have prostate cancer
- We recommend making free PSA ( unbound by antichymotrypsin )
- Low free

PSA = biopsy (PSA related to antichymotrypsin is more specific for cancer than for BPH)

PSA over 10 ng / dl

- 2/3 have prostate cancer

OBS.: PSA can be decreased by inhibitors of 5 alpha reductase

Methods of treatment

- Prostatectomy
  - Complications
    - Erectile dysfunction
    - Urinary incontinence
- Radiotherapy , Brachytherapy
- Therapy of Private androgenic
  - 70-80% of the prostate cancer are hormone-dependent
  - High risk of recurrence in the next 3 years

## **Prostatitis**

- Epidemiology
  - Bacterial
    - E.Coli
    - Pseudomonas
    - Staphylococcus
    - Enterococcus
    - Gonococcus
  - Unbacterial
    - Chlamydia
    - Mycoplasma
    - Viruses
  - Autoimmune

Acute bacterial prostatitis

- Fever , chills
- Frequent and painful urination
- Feeling of burning on urination
- Perineal , suprapubic or sacral pain
- Pain at rectal examination

Paraclinic

- Leukocytosis
- Haematuria
- Bacteriuria , pyuria
- Positive urine culture
- Prostatic secretion

#### Treatment

- According to the antibiogram
- 4-6 weeks

#### Chronic bacterial prostatitis

- Context
  - prostatitis acute incompletely treated
  - Adenoma of prostate
  - Calculation in the prostate
  - Diseases of the urethra
- Clinic
  - Evolution in shoots
  - Signs voiding irritation
  - Pain at ejaculation
  - Urethral leaks
  - Perineal or lumbosacral pain
- Paraclinic
  - Prostatic secretion
  - Uroculture after prostate massage
- Treatment
  - Antibiotic
  - Anti-inflammatory
  - warm baths
- Treatment
  - Trimethoprim-sulfamethoxazole
  - Chinolone
  - Cephalosporins
  - 6 to 12 weeks to 3 months

#### Unbacterial prostatitis

- Mictional irritative signs
- Perineal or suprapubic discomfort

#### Paraclinic

- Prostatic secretion
  - Increased leukocytes
  - Negative cultures
- Treatment
  - Antibiotic
  - Symptomatic

### **Prostatodynia**

- Non- inflammatory disease
- normal urine exam
- normal prostatic secretion

#### Treatment

- Alpha-blocker

## Chronic kidney disease

- Destruction of nephrons
- Compensatory hypertrophy of the remaining nephrons ( functional and structural hypertrophy )
- Glomerular sclerosis
- Interstitial fibrosis
  
- = progressive azotaemia

### Kidney failure

- = the final stage CKD

### Chronic kidney disease

- = kidney damage ( biopsy )
- Or
- = GFR below 60 ml / min / 1.73 m<sup>2</sup>
    - For the over 3 months

### Normal GFR - depending on age , sex and height

- Healthy young adult : 120-130 ml / min / 1.73 m<sup>2</sup>
- After 30 years: decreases annually by 1 ml / min / 1.73 m<sup>2</sup>

### GFR calculation formulas

- MDRD (Modification of Diet in Renal Disease)
- Cockcroft-Gault (sex, age , weight )
- CKD-EPI (Chronic Kidney Disease Epidemiology)

### Etiology

- Glomerulonephritis
- Diabetes
- Hypertension
- Idiopathic (15%)

### Clinic

- CKD becomes clinically evident when GFR drops below 20% (20 ml / min / 1.73 sqm )

### Investigation of laboratory

- Blood
  - Increased urea
  - Increased creatine
- Urine examination
  - Isosthenurie
- Urinary sediment
  - Granular , massive cylinders ( due to nephron hypertrophy )

### Useful for diagnosis and treatment monitoring

- Hemogram



- Ionogram ( calcium , potassium , phosphates )
- Acid-base balance
- Uric acid
- Lipid profile

Renal ultrasound

- Kidney size - low ( normal size does not rule out diagnosis )

Radiology

- Renal osteodystrophy - due to hyperparathyroidism sec. ( subperiosteal reabsorption at the radial edges of the phalanges )

Monitoring by family doctor

- Initial evaluation
- GFR
- Summary and urinary sediment
- Uroculture
- Urinary albumin / creatinine ratio
- Renal ultrasound

+

- Avoid nephrotoxic medication
- Early identification of complications
- Assessment of the compliance to change the style of life
  - hypoprotein diet , hyponatraemic diet
  - optimal hydration
  - stop smoking
  - reduction of alcohol consumption
  - physical exercises