Urinary tract infection in patients with neurogenic bladder

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Urological system is at risk in neurogenic bladder

- In the past > 40% of mortality and morbidity. Today 4-13%
- Risk for life threatening urinary septicaemia 200 times higher than General population
- Renal plasma flow measurement and radionuclide renogram: 35 % SCI individuals have abnormal results.

- Hackler J Urol 1977;117:486-8
Urinary tract infection (UTI)

- the most frequent complication
- Main cause of readmission Cardenas et al Arch Physic Med Rehab 2004
- Bacteremia in rehospitalization most frequent from UTI Waites et al J Spinal Cord Med 2001

Urinary tract infection (UTI)

- Incidence figures vary < Uniform guidelines missing
- Defence against infection failed
Different levels of failing defense

- Defence antibodies kidney fail
- GAG Layer of bladder epithelium ruptured
- Hydrokinetic mechanisms fail
  - Diuresis
  - Frequency voiding/emptying
  - Completeness of voiding/emptying
- Defence in prostate fails

Causes for UTI in neurogenic patients

- Catheterization
- Bladder overdistension
- High pressure voiding
+ Bladder causes

- Vascularisation and gross anatomy of bladder wall disturbed: diverticula, vesico ureteral reflux

- Post emptying residual volume (regularly 50 to 100 ml with intermittent catheterisation)

- With reflex voiding, straining and Crédé residual urine = higher

Role of bowel bacteria

- Role of microbiota dysfunction

- Constipation

- Faecal incontinence
+ Virulent bacterial factors

- **Bacterial adhesion**
  - E.coli: P1 pili – lectine
  - E.coli: P-fimbria

- **Other factors**
  - haemolysin toxin,
  - antigen H, K, O
  - aerobactin

> Virulent bacterial factors

Exposure to antibiotics = development of resistance
The role of biofilm

Practical clinical approach

• Acute admission: almost never UTI
• Acute stage: UTI consequence of urinary catheter
• Rehab and follow up: consequence of neurogenic bladder/bowel dysfunction
Prevention of UTI in rehabilitation phase

• General prevention against nosocomial infections
• Strict antibiotics policy
• Depend on bladder drainage technique used

Prevention of UTI in ambulatory phase

• Bacteria may be different
• Drinking enough, emptying regularly, general hygiene

Indwelling catheter prevention infection

- CLOSED DRAINAGE SYSTEM
- NOT CLAMPING
- GENERAL HYGIÈNE (HANDS OF CARERS)
- CHANGE CATHETER REGULARLY
- USE INDWELLING CATHETER AS SHORT AS POSSIBLE
- SEPERATE CATHETERIZED PATIENTS ON THE WARD.
Indwelling catheter and infection prevention

Of little use

- Antibacterial instillations: resistance
- High diuresis and free catheter outflow
- Chronic peroral antibiotics
- Unindicated bladder rinse

Suprapubic Indwelling catheter prevention infection

- CLOSED DRAINAGE SYSTEM
- GENERAL HYGIÈNE (HANDS OF CARERS)
- NO CLAMPING
- NO RINSE
- REGULAR CATHETER CHANGE
After max 5 - 6 weeks, bacteriuria will develop

Intermittent catheterization and infection prevention

- Catheterization 4 - 6 per day
- Antibacterial: be aware of resistance development
- Methenamine hippuraat, nitrofuran, oxolic acid, cotrimoxazole, ...
- Ascorbic acid as adjuvans if prevention is needed
- Start CISC as soon as possible (2 – 3 weeks)
Diagnosis of infection

Dipstick
Dipslide
Microscopy
Culture
Clinical observation

Collection and Handling of urine samples may and will not seldom go wrong
Treatment of UTI in the longterm

- First choice antibiotics nitrofurantoin or trimethoprim, the second choice fluoroquinolones (level III) BUT depends on setting
- 5 days of antibiotic treatment in UTI without fever, a minimum of 14 days in patients with UTI and fever (level III).

Urinary sepsis

**Treatment:**
1. Antibiotics
2. Drug against fever
3. High diuresis
4. Open catheter for continuous outflow urine
**Prostatitis**

- Acute prostatitis most probably prevalence underestimated
- Chronic prostatitis: most probably underestimated
- Diagnosis: clinical, urine-evaluation, Xrays, localisation tests
- Treatment?

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**Urethral infection**

- **Urethritis**: mostly with indwelling catheters but also in 2 – 19% with CIC
  - treatment with better catheter care
  - antibiotics if needed
- **Paraurethral abscess/fistulae with indwelling catheter**
  - Drain
Genital infection (Epidydimitis)

- prevalence 2-28%,
- CIC an independent risk factor.
- Urethral stricture may be a contributing factor.
- Indwelling catheters
- Genital infection may lower fertility.
Thanks for the attention