


Prevention of Bacterial and Fungal Peritonitis

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**FOR SALE
John Deere A**



Runs good. Missing steering wheel and seat.
Ideal for the person who has lost his ass and
dont know which way to turn.

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Peritoneal Dialysis-related Infection

- Common complication of PD
- Leading cause of hospitalization in PD patients
- Leading cause of switch to hemodialysis
- Peritonitis can cause loss of membrane function
- Peritonitis increases risk of death- sepsis and CVD
- Second leading cause of death in PD patients
- Peritonitis rates are decreasing in most centers
- Proportionally more exit site infections

Read this!

Read this

- Li PK, et al. ISPD Peritonitis recommendations: 2016 Update on prevention and treatment. Perit Dial Int 2016; 36: 481-508.
- Piraino B et al. ISPD statement on reducing the risks of peritoneal dialysis-related infection. Perit Dial Int 2011;31:614-630

Available on line at www.ISPD.org

AND

Bender FH, J Bernardini, B Piraino. Prevention of infectious complications in peritoneal dialysis: best demonstrated practices. Kidney Int 2006;70:S44-S54.

Epidemiology

- Peritonitis and ES rates decreasing over time
- 1980s- > 1 episode/pt year, now < half that
- Gold standard- < 0.5 infection/yr, 1/ 24 months
- Reported rates range from 0.06/yr(1/17yr) to 1.66/yr
- ? Improved technology, technique
- Rates of CAPD vs CCPD ?
- Higher risk groups, or individuals?
- Recurrences- patient (technical), bacterial factors, biofilms- relapse shortly after

Prevention-General

- Rigorous patient education, training in techniques
- Catheter and exit site care
- Analyze the cause of each infection
- Monitor your overall case rates, CQI
- Monitor organisms and drug susceptibilities
- Adjust your empiric antibiotic regimens

Monitoring Peritonitis

- Every program should monitor peritonitis rates at least quarterly, specific organisms, susceptibilities
- A team approach to CQI is the key
- CQI team- multi D- nephrologist, nurse, social worker
- Each episode of PDI- root cause analysis
- Rates-expressed as episodes/patient- year, organisms
- Yearly- 80% of pts should be peritonitis-free
- Patient factors-risk varies
- Your organisms, drug susceptibilities- use to target empiric antibiotics regimens for PDIs

Training Programs

- Training methods influence the risk of PDIs
- Nurse trainer as per 2006 ISPD training guidelines
- Using principles of adult education
- Prepare the trainer, develop a specific curriculum
- A trained trainer is more effective than an experienced one
- Home visit by PD nurse?
- What is contamination? What to do?
- Signs of peritonitis
- Routine retraining- at 3months, and at least yearly

Prevention- Patient Training

- Compliance with exchange protocol- critical
- Training in aseptic technique is a must
- Hand washing- dry hands
- Exit site care- cleanse daily- soap and water, ?others
- No spiking- if possible
- Prevent constipation
- Alert for hazy fluid, abdominal pain
- Wet contamination- call 911, ? 2d PO antibiotics
- Exit site leak- call 911, antibiotics as needed
- Retraining after peritonitis episode
- Keep pets away especially cats

Prevention- Equipment/technical

- No catheter type is better than silicone Tenckhoff
- Tunnel downward, Swan-neck?
- Placement technique- probably no difference
- PD solution- probably no difference
- Double cuffed catheter better than single cuff?
- Prophylactic antibiotics at catheter insertion
- Pre-op staph decolonization?
- Avoid trauma/hematoma during placement
- Exits site- round and tight, no sutures
- Till healed- dressing changes by dialysis nurse, keep dry

Antimicrobial Prophylaxis

Pre-op IV antibiotic at catheter placement reduces early infections- Cefazolin or vancomycin

Break in technique- 2 days of antibiotics pending cultures

Pre-procedure antibiotics- like endocarditis?

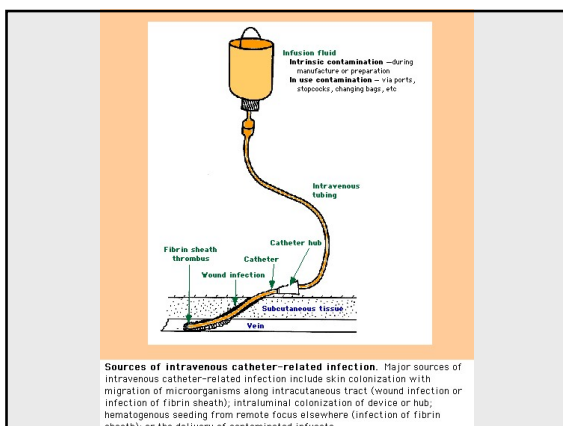
- Dental- amoxicillin 2 gr PO
- Colonoscopy with polypectomy- IV ampicillin and gentamicin, +/- metronidazole

Connection Methods

- Y-connectors with double bags
- Avoid spiking bags
- Flush before fill
- CAPD vs CCPD (APD)?
- CCPD- dry day may reduce risk of peritonitis

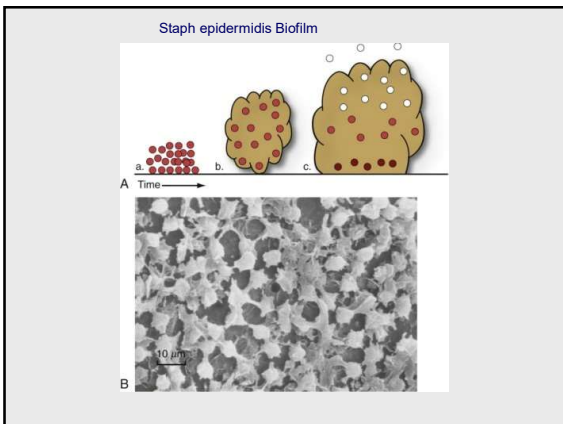
PD Peritonitis Issues

- Exit site infections- morbidity, peritonitis, catheter loss
- Skin wound- skin flora colonizes, density of colonization
- Spectrum of pathogens
- Emerging resistant pathogens



Peritonitis-Pathogenesis

- Bacterial or fungal contaminant
- PD fluid as culture material
- Initial paucity of host defense
- Bacterial products- inflammatory cells, cytokines
- ? PD fluid impairs phagocytic function
- Biofilms- impair response to RX, nidus for relapse
- Fibrosis as part of inflammatory response



Exit Site Infection

- Exit site- breach in host barrier defense
- Skin is not normally sterile
- Good exit site care
- Bacteria colonize, may infect, colonization density
- Appearance- good vs bad exit site
- Inflammatory response- red, purulent exudate
- May track down tunnel- tunnel infection, peritonitis

Exit Site Care

- Exit site infection can lead to peritonitis
- Cleanse exit site- soap+H2O, dilute bleach
- Hand hygiene- before exam or exit site care
- Topical antimicrobial to exit site- cream not ointment
- Ointments can damage polyurethane catheters
- Mupirocin- preferred, reduces staph ESIs
- Gentamicin-? resistant GNRs, Candida, NTMs
- ? Ciprofloxacin otic solution
- ? Selection of antimicrobial resistant organisms
- Topical Medihoney?

Peritonitis- Preventable Causes

Transmigration of bowel flora?

- Constipation, diarrhea, inflammatory enteritis- IBD
- Cholecystitis, bowel ischemia, diverticulitis/osis, appendicitis, bowel perf- enterics
- Hypokalemia- gram negative rods
- Hypoalbuminemia
- Vitamin D deficiency
- Pets in dialysis area- Pasteurella multocida



Procedure-related Peritonitis

Colonoscopy

- Peritonitis in 6.3% without antibiotic prophylaxis
- ?Ampicillin + gentamicin, +/-metronidazole IV or IP

Cholecystectomy- risk of peritonitis

Drain fluid before procedures

Dental work- transient bacteremia- peritonitis

- Amoxicillin 2 gr PO pre dental work

Prevention?

- Address need for colonoscopy, dental work, chole before starting PD

Candida Infections-General

- Incidence increasing in many areas of medicine
- Everyone is colonized- GI, mouth, GU, skin
- Antibiotics, kill bacteria- candida density increases
- Colonization precedes infection, density
- Risks- devices, surgery, ICU, antibiotics, steroids
- Changing species- less albicans, more non-albicans
- Decreasing azole susceptibility- ie fluconazole
- New drugs- echinocandins, broader azoles

Fungal Peritonitis

- Usually candida species- endogenous
- Changing candida species, decreasing azole efficacy
- Non-candida- usually molds, environmental source
- Usually touch; ESI, tunnel- not infrequent
- Usually- multiple priors, recent peritonitis or antibiotics
- Clinically- candida looks like bacterial
- High mortality, catheter loss
- Gram stain and culture- candida grows on routine
- Catheter removal is usually needed, reduces mortality

Preventing Candida Peritonitis

- Rates of fungal peritonitis are highly variable
 - Major risk is antibiotic therapy
 - Antifungal prophylaxis?- depends on local rates- or just do it- ISPD 2016
- High incidence, high risk-antifungal during antibiotics
Fluconazole- PO or IV- systemic drug- 200mg Q 48h
- High rates of candida peritonitis- fluconazole reduces
 - Worry- selection of azole resistant- C. glabrata, krusei
- Nystatin- PO, topical, not absorbed systemically
- PO nystatin decreases GI colonization, 500,000 U qid

Relapsing and Repeat Peritonitis

- Relapse- 2nd episode, same bug < 4weeks
 - Repeat- 2nd episode, same bug, > 4weeks
 - Recurrent- 2nd episode- different bug < 4 weeks
- Relapse and repeat- ?Biofilm on catheter
- Coag negative staph- biofilm, also S aureus, others
 - Replacing catheter reduces risk of subsequent PDIs
 - Fluid clear, sterile- may do one-stage replacement

In Conclusion

- Peritonitis rates are decreasing- strong work!
- State of the art
- Patient training, reinforcement, retraining
 - Better equipment and techniques
 - Prophylactic and preemptive antibiotics as needed
 - Exit site care and topical antimicrobials

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