Prevention and Treatment of CRBSI: What is New?

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Abstract

- This session is designed to inform you about “what is new in the prevention and treatment of catheter related blood stream infections” and will describe recent data related to CRBSI as well as discuss current guidelines for treatment and prevention as well as endorse the goal of zero tolerance re CRBSI.

What’s New? Data

- DOPPS
- USRDS
- FFCL
- CDC

USRDS

End Stage Renal Disease (ESRD) National Coordinating Center (NCC)
International VA Data – DOPPS 4

Vascular Access Today in US

Fistula First ~ 63% (5/15)

Catheter Last!

VA use during the first year of HD by time since initiation of ESRD treatment, among patients new to HD in 2012,
Abbreviations: AV, arteriovenous; ESRD, end-stage renal disease; HD, hemodialysis; VA, vascular access.

Data Source: Special analyses, USRDS ESRD Database. ESRD patients initiating HD in 2005-2012.

VA VA use among HD patients at initiation of ESRD treatment, from the ESRD Medical Evidence Form (CMS 2728).

Data Source: Special analyses, USRDS ESRD Database. ESRD patients initiating HD in 2012.

VA use during the first year of HD by time since initiation of ESRD treatment, among patients new to HD in 2012.

Data Source: Special analyses, USRDS ESRD Database and CROWNWeb. ESRD patients initiating HD in 2012.

Trends in adjusted all-cause, cause specific hospitalization rates, hemodialysis.
Adjusted Infection mortality in the first year of hemodialysis, by year of initiation of dialysis

Vascular Access Guidelines
- KDOQI 2006
- ERBP 2010
- CDC 2011
- UK Renal Assoc 2015

What's New?
CRBSI Treatment Data in Outpatient HD:
- CDC MMWR 2011 60(08) states:
  - Estimated rate of 1.05 per 1000 catheter days yielded an estimated 37,000 cases of CRBSI in 2008
  - Costing between $3700 and $28,000
  - 12-25% attributable mortality

Data Source: Special analyses, USRDS ESRD Database. Adjusted (age, race, sex, ethnicity, and primary diagnosis) all-cause and cause-specific mortality in the first year of hemodialysis. Ref: incident hemodialysis patients, 2011.
What's New? Treatment

- Early recognition of S&S*
  - Rigorous chills
  - Temperature spike
- Blood cultures and sensitivities – 2 sets followed by:
- Broad spectrum IV antibiotics
- Wire over new catheter within 72 hours

Catheter Exchange

- Wire placement
- Cathetergram to detect fibrin sheath
- Balloon disruption
- Wire over new catheter
- Culture the tip

Antibiotic Coverage

- Rx appropriate antibiotic coverage according to cultures and sensitivities:
  - Nasal swab & treatment if Staph aureus
  - IV antibiotics for 3 weeks
  - Longer if recurrence of CRBSI
  - OR risk of metastatic infection
  - Response to Rx i.e., cessation of S&S
- Repeat blood cultures ONE week post cessation of antibiotic Rx
Alternatives to CVC Access

- Reassess opportunities to remove CVC quickly and permanently
  - AV alternatives – many innovations
    - Early cannulation grafts
    - Hybrid graft with outflow components
  - Revisit potential for PD or transplantation!

PREVENTION IS PRIMARY!

Protect patients...protect healthcare personnel...
promote quality healthcare!

Five Steps to Prevent Central Line Infections

1. Wash hands using soap & water prior to placing the catheter.
2. Wear sterile gloves, hat, mask and gown.
3. Perform hand hygiene with alcohol-based hand rub in the grade, if available.
4. Cleanse the insertion site on the patient’s arm with antimicrobial solution.
5. Remove catheters when they are no longer needed.

Safe Patients, Smart Hospitals – Pronovost, P.
Five Steps to Prevent Central Line Infections

Collaborative study¹ tested this:
- Goal to reduce CRIs in:
  - 103 ICUs in 67 hospitals
  - With 2.7/1000 catheter days rate
- Rate dropped to zero in 3 months
- Remained at zero for following 18 mths

HD facility study² testing 1997 DOQI guidelines for CRB prophylaxis:
- With 6.97/1000 catheter days rate
- Rate dropped to 1.28/1000 over 18 months

¹ Mäkelä and Emmensel, NEJM 2008
² Bracht, Sem Dial 2003

Catheters are a Fact of Life for many HD patients!

When a catheter IS needed –
We Can and we Must prevent infection!

Infection Risk in Hemodialysis Patients – (the perfect storm)

- All ESRD patients are immunosuppressed
- Significant blood exposure
- Staff caring for multiple patients per shift
- Reduced “turnover” time

1. Mäkelä and Emmensel, NEJM 2008
2. Bracht, Sem Dial 2003
An Invitation to Infection!

Image courtesy of P. Patel, CDC

2011 Guidelines for the Prevention of CRBSI

“The goal of an effective prevention program should be the elimination of CRBSI from all patient-care areas.”


Core Interventions Program for Hemodialysis

CDC Poster to Prevent Infection in Dialysis Patients

Surveillance and Feedback with a Collaborative Network

- Monthly surveillance for BSIs
- Calculate facility rates
- Compare to rates of other NHSN facilities*
- Actively share results with clinical staff.

Hand Hygiene Observations

- Performed monthly
- 5 specific times to wash
- Shares results with staff
Catheter/Vascular Access
Care Observations
- Observe VA care and accessing of catheters quarterly
- Assess staff adherence to aseptic technique during:
  - Connecting and disconnecting CVC
  - Dressing changes
- Share results with clinical staff

Staff Education and Competency
- Train staff on infection control:
  - Access care
  - Aseptic technique
- Perform competency evaluation for skills:
  - Catheter care and accession
  - On hiring and every 6-12 months

Staff Education to Prevent CRBSI
It only takes a minute to check your patient’s catheter.

Look
- Perform catheter check at each treatment or when patient reports a change.
- Inspect site for redness, swelling, or leakage.
- Ask the patient.

Listen
- Listen for any abnormal findings during the catheter check.
- Report and document findings per facility policy and protocol.

Feel
- Insertion site for tenderness or pain.
- Skin for changes in color or temperature.

www.aacn.org
Strategies to prevent CRBSI include:
- Educating patients about infection prevention, beginning early in the process of dialysis
- Patients should be actively engaged as partners in infection prevention.


Catheter Reduction
- Every CVC patient:
  - Is assessed for maturing AV access
  - If none, has an appointment for AV access assessment on admission
  - Is assessed for and educated about PD
Chlorhexidine for Skin Antisepsis

- Use an alcohol-based chlorhexidine (≥0.5%) solution for CVC insertion and during dressing changes.

Catheter Hub Disinfection

- Scrub catheter hubs with an appropriate antiseptic after cap is removed and before accessing.
- Perform every time catheter is accessed or disconnected.

Antimicrobial Ointment

- Apply antibiotic ointment or povidone-iodine ointment to catheter exit sites:
  - after catheter insertion
  - during dressing change
- Check for interactions with catheter material
- If contraindicated, use of chlorhexidine-impregnated sponge dressing potential alternative.
2015 Guidelines for the Prevention of CRBSI

7. Prevention of catheter related infections (Guidelines 7.1-7.6)

Guideline 7.1: Minimise the use of vascular catheters
We recommend that central venous catheters should be employed as a method of last resort for longer term vascular access to minimise the overall risk of infection and the burden of central venous stenoses in haemodialysis patients (16).

Guideline 7.2: Minimising the risk of catheter-related infection
We recommend that advice should be incorporated in every transplantation of central venous dialysis catheters (16).

Guideline 7.3: Minimising the risk of catheter-related infection
We recommend that the catheter and site should be cleaned with chlorhexidine (2% i.v.)

Guideline 7.4: Minimising the risk of catheter-related infection
We recommend that an antiseptic or antibiotic lock solution be used to reduce catheter-related biofilms and other infections (3).

8. Complications of vascular access (Guidelines 8.1-8.3)

Guideline 8.1: Treatment of access infection and related bacteremias.
We recommend that central venous catheters should be removed in all patients with haemodialysis patients with catheter related bacteremia and an attempt to use another catheter is not possible (17).

The Best Way to PREVENT biofilm and BLOODSTREAM INFECTIONS is to REMOVE the CVC

The VERY Best Way to PREVENT BLOODSTREAM INFECTIONS is to NEVER PLACE a CVC
Compelling Evidence

Change In Vascular Access and Mortality in Maintenance Hemodialysis Patients

“Catheters have the worst associated mortality risk. Changing from a catheter to a fistula or graft is associated with significantly improved survival. The risk for grafts approached that of fistulas, providing an alternative to prolonged catheter exposure and potentially less hazardous bridge toward a fistula.”


CRBSI Prevention is Challenging

- “Be persistent and monitor/educate, monitor/educate, monitor/Reeducate!” (Lincoln, M. NNJ 2011)
- Believe in ZERO!

Remember! It’s always about what is best for the Patient!

Thank you!
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