The Impact of Catheter Associated Urinary Tract Infection
Prof. Brett Mitchell, Avondale College, Australia
A Webber Training Teleclass

THE IMPACT OF CATHETER ASSOCIATED URINARY TRACT INFECTION

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Hosted by Jane Barnett
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Disclosures

• Editor-in-Chief, Infection, Disease and Health
• Competitive research grants related to UTIs and CAUTIs
  – Australasian College for Infection Prevention and Control
  – Ian Potter Foundation
  – HCF Foundation
• Industry grant relating to urinary catheter use
  – Senver
• Other competitive research grants unrelated to the topic of UTIs and CAUTIs

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The impact of CAUTIs

• Assist in providing evidence on the rationale for initiatives to reduce CAUTIs

• Touch on CAUTI prevention strategies

Learning outcomes

1. To describe the frequency of healthcare associated and catheter associated urinary tract infections

2. Discuss the impact of CAUTIs

3. Outline key CAUTI prevention strategies

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What’s the problem?

1. Antimicrobial resistance
2. Prevalence
3. Impact for patients and for health services
4. Preventable

Background

- Urinary tract infections (UTIs) are common infections (Laupland et al., 2007)
- 150 million people/year globally (Gupta et al., 2001)
- 15%-25% of episodes have positive blood cultures (Bahgon et al., 2007)
- >80% caused by *Escherichia coli (E. coli)* (Nicolle, 2008)
- Community acquired (CA) or healthcare associated (HCA) classification

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Problem 1: Antimicrobial resistance

Antimicrobial resistance

Escherichia coli

Klebsiella species

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Cumulative annual change in urinary E. coli antimicrobial resistance

(Sanchez et al., 2012)

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Fasugba, et al. (2016)

Fasugba, et al. (2015)

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Antimicrobial resistance: UTIs and patients

- UTIs are common
- Are becoming increasingly resistant to antimicrobials
- Treatment challenges in the future
  - Increased treatment failure
  - Increased demand / use other ABs (cost, resistance, increase hospitalisation)

As AMR increases, UTIs will become more difficult to treat

Problem 2: Prevalence
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Problem 2: Prevalence

Breakdown of HAIs

20-80% Catheter-associated


Frequency - PPS

Country | Author | Rank
---|---|---
Argentina | Durlach et al, 2012 | 2
Belgium | Vrijens et al, 2012, Gordts, 2010 | 1
Canada | Taylor et al, 2016, Gravel et al, 2007 | 1
Egypt | See et al, 2013 | 2
Finland | Lyytikainen et al, 2008 | 2
France | Thiolet et al, 2008 | 1
Greece / Cyprus | Kritsotakis et al, 2008 | 2
Ireland/Northern Ireland | Fitzpatrick et al, 2008 | 1
Hungary | Caine et al, 2013 | 2
Iran | Lajhaaezadeh et al, 2008 | 2
Italy | Lanini et al, 2009 | 2

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Problem 2: Prevalence

- HAUTI = 1.4%
- CAUTI 0.9%
- 26% of patients received a catheter

Patients and health services

- 82 acute care hospitals; 17 aged care facilities
- HAUTI prevalence
  - 1.4% (95% CI 0.8-2.2%) in acute care
  - 1.5% (95% CI 0.8-2.6%) in aged care.
- Catheter use
  - acute care (9.3%)
  - aged care (3.3%)

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Problem 3: Patients and health services

• Mortality & length of stay associated with HAUTIs
• Noncurrent cohort study, 4.5 years, 8 NSW hospitals
• Mortality: Cox regression model
• LOS: Multistate model

(accepted Journal Hospital Infection)

Problem 3: Patients and health services

• HAUTI incidence: 1.73% (95% CI 1.67–1.80)
• Females more likely (unadjusted OR 2.5; 95%CI 2.3–2.7).
• Mortality: varies….
• Extra LOS = four days (95% CI 3.1–5.0)
• Infection significantly reduced the rate of discharge
• Women were more likely to acquire an infection and more likely to be discharged. The elderly were less likely to be discharged

(Mitchell, Ferguson et al, 2016)
Problem 4: Preventable

Breakdown of all HAIs

UTIs are one most common HAIs
CAUTIs represent a large proportion of these
Reducing CAUTIs = Reduction in HAIs overall

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Preventable: Catheter use, common & inappropriate

- Tertiary hospital, 54% inappropriate use, 13% documented reason (Gokula et al, 2004)
- Of 886 admissions, 10.7% catheter first 24hrs, 38% no justifiable reason (Munasinghe et al, 2001)
- STRUTI study: 26% patients received a catheter, 61% no documented reason; 71% no idea who inserted it (Mitchell, 2015)
- Survey 288 physicians, 31% didn’t know pt had catheter, 41% inappropriately catheterised - Saint et al (2000)

Preventable: Risk Factors

- Female
- Older age
- Non maintenance of closed system
- Catheter duration
- Risk of bacteruria increases with days of catheterisation
  5% per day that catheter is in place


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CAUTI: Largely preventable

- CAUTIs are by their nature associated with urinary catheters
- Large number of catheters are inserted/used catheters
  - 26% of patients admitted to hospitals have urinary catheter inserted (Gardner et al, 2016).
- Catheter use is largely inappropriate
  - Reduction in catheter use -> reduction in CAUTI
- Evidence to suggest that CAUTI initiatives work

CAUTI: Largely preventable

- Unnecessary catheter use and other strategies (e.g. reminder system, stop order etc) work
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(Meddings et al, 2013)

Available online at www.alexroadirect.com

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Review
Systematic review and meta-analysis of the effectiveness of antiseptic agents for meatal cleaning in the prevention of catheter-associated urinary tract infections

O. Fasugba a, b, *, J. Koerner a, B.G. Mitchell c, d, A. Gardner a

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b Lifestyle Research Centre, Avondale College of Higher Education, Cooranbong, New South Wales, Australia
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d School of Nursing and Midwifery, Griffith University, Brisbane, Queensland, Australia

(Fasugba, Koerner et al, 2016)

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CAUTI: Largely preventable

Sustainable

(Regagnin et al, 2016)

CAUTI: Largely preventable

The NEW ENGLAND JOURNAL of MEDICINE
ESTABLISHED IN 1812 JUNE 2, 2016 VOL. 374 NO. 22
A Program to Prevent Catheter-Associated Urinary Tract Infection in Acute Care
Sanjay Samt, M.D., M.P.H., Todd Greene, Ph.D., M.P.H., Sarah L. Keene, Ph.D., R.N., Mary A.M. Rogers, Ph.D.,
David Ritz, M.S., Karen E. Forder, M.P.H., Barbara S. Edson, R.N., M.B.A., M.H.A.,
Sam R. Watson, M.S.A., C.P.P.S., Barbara Meyer-Lucas, M.D., M.H.S.A., Marie Matsuka, R.N., M.S.N.,
Kelly Foulser, M.S.P.A., Carolyn V. Gould, M.D., M.S.C.R., James Bittles, Ph.D.,
and Mohamad G. Falih, M.D., M.P.H.

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Preventable: Guidelines

- ACIPC / ASID (HICSIG)
- HICPAC
- European and Asian guidelines
- EPIC3
- SHEA/IDSA
- NHMRC ICGs

But guidelines are not enough...

Small majority of house staff respondents reported awareness of CAUTI prevention guidelines

Minority of respondents could correctly identify all appropriate/inappropriate indications for catheterization in common clinical scenarios.

(Paras et al, 2015)
Who would like a UTI / CAUTI?

• As a healthcare professional / ICP
  – High quality care provide
  – Avoid wherever possible preventable infections
  – Don’t want high rates of infection

• As a patient/consumer
  – Physical
    • Frequency (n=8), very painful (n=7), bleeding (n=6), cold/flu like (n=4), stinging (n=3)….
  – Emotional
    • Generally unwell (n=6), normal duties disrupted (n=3)
  – n=27

(Beydon et al (2010). BMJ, 340, c279)

Briefly, some other things…. challenges

• Surveillance / monitoring
  – What about administrative data?

• Is it a CAUTI / UTI or not?
  – HAI Controversies blog

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I am a urinary catheter
Dark places I must go
My job is clear
I have no fear
I need to ease the flow
You are the one I am inside
It enters not your head
That if I’m left in
(a mortal sin)
You could just end up dead
At times, I am a useful aide
But my use you should not flout
On every day
Someone should say
It’s time to take me out!


Who would like a UTI / CAUTI?

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The impact of HAUTIs and CAUTIs

- Emerging problem for patients and the health service
- Current impact is not insignificant
- Common
- Preventable
- QI programs
- Research
- Surveillance

Conclusion

1. Frequency
2. Antimicrobial resistance
3. Impact
4. Largely preventable

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### References

References

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