GUIDELINES FOR URINARY TRACT MANAGEMENT AT THE TIME OF ARTHROPLASTY OF THE HIP AND KNEE

Authors: Nigel Broughton, Chris Stokes, Trisha Peel*, Phong Tran, Chris Wilson, Al Burns, Michael Solomon and Steve McMahon

*Infectious Diseases Senior Research Fellow, Alfred Health, Melbourne

Introduction

Hip and knee arthroplasty continues to be amongst the most successful medical interventions for improving quality of life. However, these interventions are a balance of benefit and exposure to risk. Prosthetic joint infection (PJI) is a significant complication which can occur following this procedure. It can be devastating to the patient as it impedes recovery, may be painful and may require several operations in an attempt to overcome it. It is a huge burden to patients and costly in health care resources. Urinary tract infection (UTI) has long been considered an independent risk factor for PJI.[1]

The Arthroplasty Society of Australia considers literature, registry data, the Therapeutic Guidelines, recommendations by the AAOS, ACCP, RACS and other learned organisations to formulate these guidelines. They are based on evidence and evaluation by practising arthroplasty surgeons in Australia.

Pre-operative work up

Many arthroplasty surgeons perform a Mid Stream Urine (MSU) test on all patients prior to hip or knee replacement. Whilst a negative result can be reassuring there is wide variation as to how an abnormal result is managed.

Although there is an increased risk of PJI in patients with asymptomatic bacteriuria (AB) the bacteria causing the PJI is different from that in the urine[2-4] and no studies have linked the bacteriuria organism to any subsequent PJI. Also, treatment of the AB appears not to influence the incidence of PJI.[3,5-8]

Recommendation

Routine screening of urine in an asymptomatic patient prior to hip or knee surgery is unnecessary as treatment of asymptomatic bacteriuria confers no benefit to the patient.[9,10]

Only patients with the typical symptoms of UTIs such as dysuria and frequency should have an MSU performed prior to surgery.

This recommendation is in line with advice from the Therapeutic Guidelines, AAOS and other international bodies*.[11,12]

If the patient has a UTI, treatment is indicated, although there is no evidence that treating the UTI reduces the risk of subsequent PJI.

Use of Indwelling Catheters (IDC)

The use of IDCs around the time of surgery remains at the discretion of the treating surgeon.

Recommendations

Due to the increase in UTIs with prolonged use, IDCs should be removed as early as possible post-operatively, preferably on day 1 and not to wait until a bowel movement has taken place.[9,13,14]

There is no need to continue antibiotics as a precaution whilst an IDC is in situ nor is there any need to give prophylactic antibiotics at its removal.[15] In fact the tradition of giving prophylactic antibiotic at the time of insertion of an IDC is not supported by good evidence.[4,16,17]

Insertion should be by a sterile technique but skin prep with sterile water is adequate and Betadine or chlorhexidene is not required. The use of lubricant or anaesthetic gel minimises urethral trauma and discomfort.[18,19] (NHRMC and NHS guidelines)

Many routinely use an IDC when spinal or epidural anaesthesia is used because of concerns about the patient developing retention. The risk of retention has been reported by some to be low[20]. Others selectively use an IDC on a case by case basis particularly in males when morphine is used in the spinal as this has been shown to have a high rate of retention[21].

* The French Infectious Diseases Society, the National Institute for Health and Care Excellence (NICE)[18], Infectious Diseases Society of America[17] and the Scottish Intercollegiate Guidelines Network (SIGN)[12]

November 2018

Updated and Approved May 2022

References

1. Wilson M; Kelley K; Thornhill T. Infection as a Complication of Total Knee-Replacement Arthroplasty. *J Bone Joint Surg Am*. 1990;72-A(6):878-883.

2. Cordero-Ampuero J; Gonzalez-Fernandez E; Martinez-Velez D; Esteban J. Are Antibiotics Necessary in Hip Arthroplasty With Asymptomatic Bacteriuria? Seeding Risk With/Without Treatment. *Clin Orthop Relat Res*. 2013;471(12):3822-3829.

3. Sousa R; Munoz-Mahamud E; Quayle J; *et al*. Is Asymptomatic Bacteriuria a Risk Factor for Prosthetic Joint Infection? *Clinical Infectious Diseases*. 2014;59(1):41-47.

4. Scarlato R; Dowsey M; Buising K; Choong P; Peel T. What is the role of catheter antibiotic prophylaxis for patients undergoing joint arthroplasty? *ANZ J Surg*. 2017;87:153-158.

5. Zhang Q; Liu L; Sun W; Gao F; Cheng L; Li Z. Research progress of asymptomatic bacteriuria before arthroplasty - A systematic review. *Medicine*. 2018;97(7):e9810.

6. Mayne A; Davies P; Simpson J. Antibiotic treatment of asymptomatic bacteriuria prior to hip and knee arthroplasty; a systematic review of the literature. *The Surgeon*. 2018;16(3):176-182.

7. Koulouvaris P; Sculco P; Finerty E; Sculco T; Sharrock N. Relationship between peri-operative urinary tract infection and deep infection after joint arthroplasty. *Clin Orthop Relat Res*. 2009;467:1859-67.

8. Barnsley, L; Coetzee, C; Tran P. Treating asymptomatic bacteriuria before arthroplasty – are we wasting our time? Podium Presentation, AOA ASM (Perth) Thursday 11th October 2018.

9. David T; Vrahas M. Perioperative Lower Urinary Tract Infections and Deep Sepsis in Patients Undergoing Total Joint Arthroplasty. *J Am Acad Orthop Surg*. 2000;8:66-74.

10. Duncan R. Prosthetic Joint Replacement: Should Orthopedists Check Urine Because It's There? *Clinical Infectious Diseases*. 2014;59(1):48-50.

11. Nicolle L; Bradley S; Colgan R; *et al*. Infectious Diseases Society of America guidelines for the diagnosis and treatment of asymptomatic bacteriuria in adults. *Clinical Infectious Diseases*. 2005;40:643-54.

12. Scottish Intercollegiate Guidelines Network (SIGN). SIGN guideline 88. Management of suspected bacterial urinary tract infection in adults. Available at: https://www.sign.ac.uk/assets/sign88.pdf Accessed on 25 September, 2018

13. Wald H; Ma A; et al. Indwelling urinary catheter use in the postoperative period: Analysis of the national surgical infection prevention project data. *Arch Surg*. 2008;143(6):551-557.

14. Daines B; Dennis D; Amann S. Infection Prevention in Total Knee arthroplasty. *J Am Acad Orthop Surg*. 2015;23(6):356-364.

15. Marschall J; Carpenter C; Fowler S; Trautner B. Antibiotic prophylaxis for urinary tract infections after removal of urinary catheter: meta-analysis. *BMJ*. 2013;346:f3147.

16. Antibiotic Reference Group. *Therapeutic Guidelines: Antibiotic*, 15th edn. Melbourne: Therapeutic Guidelines Limited, 2014.

17. Hooton T; Bradley S; Cardenas D; Colgan R; Geerlings S. Diagnosis, Prevention, and Treatment of Catheter-Associated Urinary Tract Infection in Adults: 2009 International Clinical Practice Guidelines from the Infectious Diseases Society of America. *Clinical Infectious Diseases*. 2010;50(5):625-663.

18. National Health Service (NHS) Guidelines Indwelling Catheters. Available at: http://www.southernhealth.nhs.uk/_resources/assets/inline/full/0/70589.pdf. Accessed on 17 September, 2018.

19. NHMRC Guidelines, Australian Government. Indwelling urinary devices. Available at: https://www.nhmrc.gov.au/book/australian-guidelines-prevention-and-control-infection-healthcare-2010/b4-2-1-indwelling-urinar. Accessed on 17 September, 2018.

20. Miller A; McKenzie J; Greenky M; Shaw E; Gandhi K; Hozack W; et al. Spinal Anesthesia: Should Everyone Receive a Urinary Catheter. *J Bone Joint Surg Am*. 2013;95:1498-503.

21. Fernandez MA; Karthikeyan S; Wyse M; Foguet P. The incidence of postoperative urinary retention in patients undergoing elective hip and knee arthroplasty. *Ann R Coll Surg Engl*. 2014;96(6):462-5