Scholars Journal of Applied Medical Sciences (SJAMS) **ISSN 2320-6691 (Online)**
Sch. J. App. Med. Sci., 2015; 3(3H):1612-1614 **ISSN 2347-954X (Print)**

(An International Publisher for Academic and Scientific Resources)
www.saspublishers.com DOI: 10.36347/sjams.2015.v03i03.120

Research Article

Impact of Urinary tract infection in Primary Joint Replacement surgery

Parag Garg[1], Roopak Patel[2], FJ Taraporvala[3], Aniruddha Pispati[4]
[1]MS orth, [2]DNB orth, [3]MS orth, [4]Student, Jaslok Hospital and research Centre, 15 - Dr. Deshmukh Marg, Pedder Road, Mumbai, Maharashtra, India

***Corresponding author**
Parag Garg
Email: paragorth@gmail.com

Abstract: Arthroplasty surgery has always been plagued by joint infection. Urinary tract infection (UTI) has always been known to be a silent player causing hematogenous spread of infection. We wanted to conduct a focused study to reveal this fact and the measures that can be taken to lower the rate of such infections. We assessed the records of 150 patients who went through arthroplasty procedures in our hospital in the past 10 months. We checked for UTI history, treatment history and any joint infections. We also checked to peri operative catheterization history and epidural anesthesia history. 12 out of the 40 patients (30 %) who were catheterized had a post operative UTI while 2 of them (5%) also got a post operative wound infection. On the other hand, only 1 out of the 110 (< 1%) non catheterized patients got post operative UTI and none of them had any post operative wound infection (0%). Patients with epidural anaesthesia had a higher UTI (34%) and wound infection rate (7%) as compared to the rest (2.4 % and none). There is a definite correlation between UTI and post op wound infection, Peri operative catheterization leads to higher UTI and wound infection and so does epidural catheterization. Pre op patients treated adequately with an antibiotic regimen fair almost as well as non UTI patients.
Keywords: Urinary Tract infection , deep joint infection.

INTRODUCTION

Deep joint infection is the most serious complication of arthroplasty surgery [1]. Hematogenous spread of infection leads to silent infection, which attacks the joints without warning. Urinary tract infection (UTI) is believed to be the most common reason for this form of infection [2]. Although pre operative urine examination is a common protocol for many centers for joint surgeries there are no conclusive studies which associate asymptomatic bacteruria with post operative infection [3]. In this study we try to establish this correlation with a study done on all our arthroplasty patients in a short period of 11 months.

Peri operative catheterization increases the chance of UTI [4], which translates, to more chances of hematogenous infections. Patients with pre operative and postoperative urinary catheterization have a higher chance of wound infection. We would also like to confirm and establish this relation with our study.

Epidural anaesthesia is preferred at many centers due to its multiple benefits during joint replacement surgery. Epidural anesthesia also runs its risk of post operative urinary retention, due to which invariably all such patients are catheterized. This, as stated before, makes them more susceptible for UTI which translates into higher rate of infections. We would also like to establish this correlation also with our study.

MATERIALS AND METHODS

Pre assessment records for all patients undergoing total knee arthroplasty & hip arthroplasty over a 11 month period were checked with regards to: urine routine analysis; symptomatic UTI patients; patients on antibiotics; any surgery deferred until UTI was cured.

UTI was defined as: pus cells more than 8 in urine routine analysis [5]. or colony count >100000 in urine culture. UTI symptoms were defined as having dysuria, urinary frequency, urgency, hematuria, suprapubic pain and/or tenderness, flank pain/tenderness. Asymptomatic bacteriuria was defined as absence of symptoms and pus cells more than 8 in urine routine micro analysis or colony count >100,000 CFU/ml.

Post operative records were checked as regards to wound complications and deep joint sepsis Wounds were considered infected if frank pus discharge from wound was present or diagnosed by a culture report.

RESULTS

Data from 150 patients operated over a 11 month period was collected. Among them, patients who

underwent total knee replacement, total hip arthroplasty or bipolar arthroplasty were included for this study (Table 1).

12 out of the 40 patients (30 %) who were catheterized had a post operative UTI while 2 of them (5%) also got a post operative wound infection. On the other hand, only 1 out of the 110 (< 1%) non catheterized patients got post operative

UTI and none of them had any post operative wound infection (0%) (Table 2).

As a hospital policy protocol we treat all patients with a pus cell count in mid stream urine of more than 8 with a pre op antibiotic course. There were 16 such cases of UTI that we detected in out pre op cases. One patient could not be started on pre op antibiotics due to time frame restrictions while another could not be completely cured before surgery with our antibiotic regimen. Both these patients had post op UTI (100%) and one of (50%) had post operative wound infection (50%). Of the other 14 cases that were successfully treated with antibiotics 2 has a post operative UTI (14%) while none had a post operative infection (Table 3).

29 out of the 150 patients (19%) took epidural anaesthesia as compared to spinal or general anaesthesia for the rest for various reasons. All of them had to be catheterized. 10 out of these 29 (34%) had post op UTI and 2 (7%) had post op wound infection. On the other hand only 3 out of the remaining 121 patients (2.4%) has post op UTI and none of them has a post op wound infection (Table 4).

Table-1: Different types of arthroplasty performed

Name of surgery	Numbers of patients
Total knee replacement	111
Total hip replacement	31
Bipolar arthroplasy	8

Table-2: Incidence of Post op UTI and wound infection

Urinary Catheter	Post op UTI	Post op wound infection
40 - YES	12 (30%)	2 (5%)
110- NO	1 (1%)	-
P-value, Significant difference	< 0.05, Significant	< 0.05, Significant

Table-3: Post treatment resutls

	UTI Patients successfully treated pre operatively with antibiotic regimen (N = 14)	UTI Patients not treated / unsuccessfully treated pre operatively. (N =2)	Significance P value < 0.05
Post op UTI	2 (14%)	2(100%)	< 0.05, Significant
Post op Wound infection	0	1(50%)	< 0.05, Significant

Table-4: Type of Anaesthesia

	Epidural anaesthesia (N = 29)	Spinal or general anesthesia. (N =121)	Significance P value < 0.05
Post op UTI	29 (34%)	3(2.4%)	< 0.05, Significant
Post op Wound infection	2 (7%)	0	< 0.05, Significant

DISCUSSION

UTI resulting in Joint infections is a widely accepted conjunction, but there is paucity of focused studies on this subject. Our study conclusively gives evidence of this conjunction. Together with that we also associate the use of urinary catheters and epidural catheters with UTI, leading to joint infections.

In our study there was an overall 2% (3 out of 150) rate Post Operative wound infection. This significant value signifies the importance of identifying key preventable factors and rectifying them.

Preoperative UTI, catheterization & epidural anaesthesia could be the contributory factors for the higher post op UTI and subsequently wound infection.

Although there were mechanisms for identifying and correcting UTI preoperatively, 2 patients still went for surgery with urinary pus cells more than 8 (in their urine analysis) due to unavoidable circumstances.

The wound infection in the patients with a pus cells (in their urine analysis) more than 8 was 50% , (1 out of 2) compared to that of patients with pus cells less than 8 (in their urine analysis) is 1.35% , (2 out of 148). On the basis of these findings, we conclude that preoperative UTI should be corrected as far as possible before undertaking any such surgery.

In this study of elective surgeries in Total Hip Replacement and Total Knee Replacement, 1.33% (2out of 150) of patients at pre admission testing were found to have pus cells – more than 8 (in their urine analysis), 98.66% (148 out of 150) were found to have to have pus cells – less than 8 (in their urine analysis). Morbidity and mortality after surgery are significantly associated with the presence of preoperative UTI [6-8]. We recommended that elective surgical patients should have a normal urine routine analysis determined at a minimum of 3 days before scheduled surgical procedures allowing time for treatment before surgery. We conclude that the implementation of a clinical care pathway for UTI management in the elective surgical patient could improve patient outcome.

Pre-operative interventions, including screening for asymptomatic or symptomatic UTI, can prevent post op UTI and finally wound infection. Other useful interventions include urine culture and sensitivity.

Avoiding intra-operative and postoperative urinary catheterization can prevent post op UTI and finally wound infection. We found that the rate of post op UTI was significantly higher (30 %, (12 out of 40 patients) among catheterized patients as compared to the non catheterized ones (1%, 1 out of 110 patients) . Similarly the post op wound infection was also higher in the catheterized group (5 % , 2 out of 40 patients) while there was no wound infection in the other group.

To reduce post operative urinary retention, it is important to catheterize patients who receive epidural anesthesia [9]. Application of epidural anaesthesia (29 out of 150) is correlated with catheterization of the patients, so indirectly correlate with increase post op UTI and wound infection .This is proven in our study where 34 % epidural catheter patients had a post op UTI and 7 % had a post op wound infection as compared to a post op UTI of 2.4 % with other anaesthesia and no wound infections.

There have been some studies which suggest that postoperative antibiotics can reduce post op UTI and wound infection [10]. Our study gives strong evidence that antibiotics administration to patients with UTI lowers the chances of wound infection. Therefore we recommend a uniform antibiotic policy for all patients with UTI before the patient can undergo surgery.

There are more chances of wound infection in patients with peri operative UTI. It is therefore important to identify and treat UTI immediately. Preoperative antibiotics help in lowering the rate of infection in known UTI cases. Preoperative catheterization also increases the risk of post operative infections. Epidural catheterization is associated with an increased risk of UTI and joint infection, and should be avoided for the same reasons

REFERENCES

1. Primary total hip/knee replacement: a guide to good practice, 2nd edn. British Orthopaedic Association, 2006.
2. Allami MK, Jamil W, Fourie B, Ashton V, Gregg PJ; Superficial incisional infection in arthroplasty of the lower limb. Interobserver reliability of the current diagnostic criteria. J Bone Joint Surg Br, 2005;87:1267–1271.
3. Berbari EF, Hanssen AD, Duffy MC, Steckelberg JM, Ilstrup DM, Harmsen WS, Osmon DR; Risk factors for prosthetic joint infection: case-control study. Clin Infect Dis, 1998; 27(5):1247–1254.
4. Wroblewski BM, Del Sel HJ; Urethral instrumentation and deep sepsis in total hip replacement. Clin Ortho, 1980;146:209–212.
5. Deville WL, Yzermans JC, Duijn NP, Bezemer PD, Windt DA, Bouter LM; The urine routine microscopy test useful to rule out infections. A meta-analysis of the accuracy. BMC Urol, 2004;4:4.
6. Douglas P, Asimus M, Swan J, Spigelman A; Prevention of orthopaedic wound infections: a quality improvement project. J Qual Clin Pract, 2001;21:149–153.
7. Hamasuna R, Betsunoh H, Sueyoshi T, Yakushiji K, Tsukino H, Nagano M, Takehara T, Osada Y; Bacteria of preoperative urinary tract infections contaminate the surgical fields and develop surgical site infections in operations. Int J Urol, 2004;11:941–947.
8. Morrow M; Urinary tract infection as nidus for systemic spread and septic arthritis. Can Vet J, 1999;40:666–668.
9. Baldini G, Bagry H, Aprikian A, Carli F; Post-operative urinary retention: anesthetic and peri-operative considerations. Anesthesiology, 2009; 110(5):1139-1157.
10. Gaine WJ, Ramamohan NA, Hussein NA, Hullin MG, McCreath SW; Wound infection in hip and knee arthroplasty. J Bone Joint Surg Br, 2000;82(4):561–565.