

Orthopaedics-2021: INADEQUATE EVALUATION AND MANAGEMENT OF SUSPECTED INFECTIONS AFTER TKA SURGERY- A REPORT FROM THE LITHUANIAN ARTHROPLASTY REGISTER ON 2,769 PATIENTS WITH TWO YEAR FOLLOW-UP

Egle Terteliene¹, Kazimieras Grigaitis², Otto Robertsson³, Justinas Stucinskas², Sarunas Tarasevicius², Narunas Porvaneckas¹ and Algirdas Venalis

Vilnius University, Lithuania ² Lithuanian University of Health Sciences, Lithuania ³ Lund University and Lund University Hospital, Sweden ⁴ State Research Institute Center for Innovative Medicine, Lithuania

Backgrounds & Purpose: The evidence-based algorithms for the treatment of periprosthetic joint infection (PJI) recommend surgical intervention in combination with use of systemic antibiotics. However, still it is not unusual to treat Total Knee Arthroplasty (TKA) patients with suspected infection only using antibiotics (AB). The aim of our study was to investigate treatment pathways for patients after TKA with suspected infection in Lithuania.

Patients & Methods: Of the 4,069 TKA patients (4,269 knees) registered in the Lithuanian Arthroplasty Register 2,769 patients (2 825 knees), were interviewed two years after the surgery. The patients were inquired if they had been subject to AB treatment after the TKA surgery and/or if any additional surgical interventions on the operated knee had been performed. The number of patients treated with antibiotics due to problems in the operated knee was identified and Cumulative Revision Rates (CRR) were calculated.

Results: 188 (6 %) patients out of the 2,769 reported that they had been prescribed AB after the primary TKA, 132 patients (70%) said they had received AB due to problems with the operated knee. Out of the 132 patients, 68 (51.5%) reported that the reason for the AB treatment had been infection prophylaxis, while the remaining 64 patients (48.5%) reported that the reason for the treatment had been that the physician had suspected a prosthetic joint infection (redness, pain, swelling on operated knee, wound leakage). The two- year CRR after TKA in patients not treated with AB was 0.7% (CI 0.4; 1), as compared to 23.6% (CI 17.3; 31.7) in those who had used antibiotics due to the problems in operated knee for more than one week. Interpretation: In Lithuania there seems to be a lack of adherence to evidence based treatment guidelines when infection is suspected after primary TKA.

Periprosthetic joint infection (PJI) after total knee arthroplasty (TKA) is recognized as the most frequent reason for revisions, especially in the early postoperative stage (Kurtz et al. 2010). Most studies report a 1–2% incidence of PJI about after primary TKA (Peersman et al. 2001, Phillips et al. 2006, Kurtz et al. 2010, Matsen Ko et al. 2016). Accurate and early diagnosis of postoperative PJI and adequate treatment is the key to success. Currently, the evidence-based algorithms concerning the diagnosis and treatment of periprosthetic joint infections of the hip and knee indicate that only surgical treatment such as a debridement, antibiotics,

irrigation, and retention of the prosthesis (DAIR) procedure or a 1- or 2-stage revision combined with systemic antibiotic treatment is to be recommended (Azzam et al. 2010, Parvizi et al. 2010, Osmon et al. 2013, Ghanem et al. 2014, Frank et al. 2017, Grammatopoulos et al. 2017). However, in “real life” some patients are still prescribed antibiotics without having surgical intervention in the hope that redness, tenderness, or wound leakage is not a serious infection and that surgical intervention can be avoided (Wagenaar et al. 2017). However, such usage of antibiotics may lead to increased bacterial resistance and more complicated treatment of an infected prosthesis, where matured biofilm on the prosthetic surface can no longer be eradicated with antibiotics only (Bjarnsholt et al. 2013). We evaluated how suspected infection after TKA was treated in “real life” in Lithuania with respect to adherence to guidelines, and investigated the outcome of antibiotic treatment without surgical intervention.

Patients and methods

Data on patients having primary TKA procedures was derived from the Lithuanian Arthroplasty Register (LAR) (Tarasevicius et al. 2014) in order to be able to contact operated patients with an inquiry regarding their use of antibiotics during the first 2 years after the primary procedure. The completeness in the LAR was investigated in 2016, by comparing the register with State Patients fund data, and was 95% for primary TKA and 98% for revisions. 4,269 primary TKAs operated in 22 hospitals were registered in LAR between September 1, 2013 and September 1, 2015. 2,825 TKAs (2,769 patients) were included in the study (Figure 1). The patients were approached by 1 of the researchers at 2 years after the primary TKA. The following questions were asked: Have you used an antibiotic after your primary TKA? When did you start using antibiotics? For how long did you use antibiotics? What was the reason for the antibiotic's usage? Who prescribed the antibiotics? Patients who responded as having used antibiotics for problems in the operated knee were additionally asked if they had been the subject of puncture. Finally, we asked whether the respondents had undergone revision at any time during the 2 years after the primary TKA. After the interview the hospital that had performed the procedure was asked to provide the relevant medical charts to ascertain that the additional surgery performed was a true revision according to the LAR definition. Revision in the LAR was defined as addition, exchange, or removal of 1 or all components. The patients were divided into 3 groups.

Group 1 comprised those who received antibiotic treatment because of problems with their knee for a period of more than 1 week during the first 2 years after the primary TKA. Group 2 included those who received antibiotic treatment for more than 1 week due to problems not related to the operated knee and Group 3 patients were those having not had antibiotic treatment or who had treatment for 7 days or less

Statistics

For descriptive statistics, we used frequencies and ranges. Statistical evaluation included 95% confidence intervals (CI). The cumulative revision rate (CRR) was calculated with Kaplan–Meyer statistics and graphs plotted with CI for all groups; a p-value < 0.05 was considered significant. STATA v13 (Stata-Corp 2013) was used for calculations. Ethics, funding, and potential conflicts of interests The study was approved by the national ethical committee (No. 158200-16-832-371, approved on 2016-06-15). No funding were received to conduct the study and no conflict of interests needs to be declared

Results

188 (7%) of 2,769 patients responded “yes” to the question: “Have you used antibiotics after the primary TKA?” When asked for the reason why antibiotics had been prescribed, 132 (Group 1) of the 188 patients (70%) said they had received antibiotics due to problems with the operated knee, while 56 (Group 2) (30%) had received the antibiotics for reasons other than the operated knee (pneumonia, bronchitis, urinary tract infection, tonsillitis). Of the 132 patients (Group 1), 68 (52%) reported that the reason for the antibiotic treatment had been infection prophylaxis, while the remaining 64 patients (49%) reported that the reason for the treatment had been that the physician had suspected a prosthetic joint infection (redness, pain, swelling of the operated knee, wound leakage). Patients receiving antibiotic treatment either for prophylaxis or due to suspected infection did not differ significantly from non-antibiotic users’ TKA with regard to their age, sex, and preoperative diagnosis. Among those 132 TKA patients who were prescribed antibiotics because of knee problems the prescribing physician was an orthopedic

surgeon in 96 cases (73%) and 34 (26%) reported having used antibiotics for more than 1 month. Of the patients in Group 1, 32 reported that they had had a knee aspiration. Of these, 23 were subsequently revised, 21 because of infection. 100 of the patients in group 1 were not aspirated

Discussion

Our results showed that 188 of the 2,769 TKA patients reported that they used antibiotics for more than 1 week, within 2 years after the primary procedure, and 132 of these antibiotics users reported that this was due to problems in operated knee. There are only a few reports in the literature investigating the success rate in curing periprosthetic infection using antibiotic therapy alone. Pavoni et al. (2004) used a non-operative approach to treat 34 patients with prosthetic joint infection (12 patients with early, 16 with delayed, and 6 with late infection). Most of the infections were initially treated with intravenous or intramuscular teicoplanin ± ciprofloxacin or rifampicin, followed by oral ciprofloxacin or minocycline plus rifampicin. 3 patients did not respond to therapy, and the infection was initially controlled in the remaining 31 patients. However, after longer follow-up (up to 5 years) less than half of the infected patients remained unrevised. In another study, Drancourt et al. (1997) reported a success rate of 52% for hips and 73% for knees when treating periprosthetic infection with a combination of antibiotics only, but the follow-up was short