The Viability of Antibiotic Prophylaxis in Invasive Dental Procedures Post Joint Arthroplasty

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Background & Purpose

Joint infections are a very serious complication regarding prosthesis and implants. When exposed to a metal surface while implanted within the body, bacteria can produce what is called a biofilm. Biofilms are more concerning than that of other pockets of infection due to a multitude of circumstances surrounding the ability and availability of treatment.

Purpose:

This paper offers guidance in the prevention of biofilm infections in joint prostheses pre invasive dental procedures. Prophylaxis is often given before colonoscopies and invasive dental procedures (IDP). Thus, the justification for antibiotic prophylaxis before invasive dental procedures is required, if needed at all.

PICOT

In adults who receive joint arthroplasty, does preprocedural antibiotic prophylaxis decrease the occurrence of joint infection and biofilm when considering invasive dental procedures in comparison to no procedural antibiotic prophylaxis?

Design & Methods

Keywords: prophylaxis, prophylactic antibiotics, total joint arthroplasty, joint arthroplasty, minor procedure, Joint replacement, Invasive Dental prophylaxis, Dental procedures

Inclusion: Must have pre dental prophylactic antibiotic intervention or discuss it, must include patients that are status post joint replacement (partial, complete, etc)**,** no history. of previous joint infection, must address joint infection prophylaxis and not the care of current joint infection

Exclusion: Previous joint infection from external cause or perioperative cause, severe periodontal disease predisposing infection to be seated and seeded elsewhere, predisposing factors such as open wounds, surgical site infection, or prior infection/abscess which can lead to joint infection

Summary of Evidence Search

Database	Yielded	Reviewed	Included in Analysis
PubMed	30	15	5
Google Scholar	1290+ 114	20	4
Elsevier	138	8	2
Ebsco Host	11	11	2
Total:	1583	54	13

Synthesis of Evidence

13 total articles were used to express the results. Of those 13, 5 major research articles were chosen to represent the results.

Study Type	Number Utilized
Systemic Review	2
Retrospective Cohort Study	1
Case Crossover analysis	1
Meta analysis	1

Results:

Author	Results
Sendi P, Et al	It is found that hematogenous seeding from IDP are less than 0.1% and other statistical estimates of 0.1 and 0.2 percent overestimate the risk. In addition, Chlorhexidine mouth rinse show greater effectiveness in decreasing biofilm and joint infections post arthroplasty in comparison to antibiotic prophylaxis
Sax OC, Et al	Antibiotic prophylaxis before invasive dental procedure had similar odds of requiring revisions and additional procurement for any cause from 90 days to 1 year, as compared with the control
Olson LB, Et al	Out of these infections, intraoperative contamination is a common cause of the early and delayed peri joint infections, while hematogenous seeding is most often responsible for late infection. There is a risk of 0.5-1 to 2% risk of peri joint infection post invasive dental procedure even with antibiotic prophylaxis.
Springer BD, Et al	This study did not provide any proof or supporting evidence between invasive dental procedures and prosthetic joint infection. In support, the study demonstrated that antibiotic prophylaxis did not decrease the risk or occurrence of developing total hip or knee infection
Salgado-Peralvo AO, Et al	It was shown that 63.4% to 71.5% of orthopedic surgeons consider the prescription of prophylactic antibiotics (PAs) to be necessary indefinitely for life in those with hip prostheses who are going to undergo dental treatment let alone that of invasive dental procedures. It was found that bacteremia in the control group was found to be 2% versus 6.7% in the test group which is inconclusive in determining a cause for seeding bacteria. With both AP and non-AP, the levels of infection were inconclusive. Thus showing that even with the use of prophylactic antibiotics, the occurrence of seeding still increased.

Best Practice

Discussion:

Prophylaxis rates of success can actually be overcome by that of chlorhexidine rinse prior to dental procedures.. Despite antibiotic prophylaxis in invasive dental procedures, asymptomatic bacteremia infection is shown, while rare, to occur at the same rate of whether or not antibiotic usage is used in prophylaxis. There is an overwhelming consensus stating that antibiotic prophylaxis for invasive dental procedures with joint replacement is completely unwarranted and does not change the overall infection rate based on hematogenous bacteremia.

Limitations/Further study:

The parameters were wide in order to collect more information. the number of sources is significantly smaller than that of other systematic studies in the same field thus restricting the overall results. There is a gap in understanding what exactly must be done to prevent joint infection with asymptomatic homogeneous bacteremia.

Conclusion:

It is more viable to recommend better oral hygiene and anti-infective rinsing agents than increasing the risk of further antibiotic resistance and increasing the cost burden on patients who are to undergo invasive dental procedures. However, there are some exceptions with that being previously poor dental hygiene status and prior joint infections.

References:

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