Consensus Report by the Italian Academy of Osseointegration on the Use of Antibiotics and Antiseptic Agents in Implant Surgery

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Purpose: Beneficial aspects of short and ultrashort antibiotic administration protocols could be clinically correlated to the reduced side effects on the gastrointestinal microflora. The aim of this Consensus Conference was to establish the necessity of an antibiotic prophylaxis and its dosage to reduce the risk of early implant failure in healthy (ASA 1 or 2), periodontally healthy patients, undergoing basic dental implant surgery (straightforward cases). Additionally, the need for an antiseptic protocol, used before and after the implant surgery, was evaluated. ***Materials and Methods:*** Active members of the Italian Academy of Osseointegration (IAO), together with several worldwide-recognized key opinion experts in the field of microbiology, implant dentistry, and infectious diseases, were participants at this Consensus Conference. Two systematic reviews were carried out, before the Consensus Conference, and their results discussed in order to give guidelines on the administration of an antibiotic/antiseptic prophylaxis in implant surgery. The systematic reviews covered the following topics: *(1)* the use of antibiotics to reduce both implant failure rate and peri-implant infections in healthy patients and *(2)* the use of chlorhexidine compositions capable of reducing complications in patients undergoing surgical interventions. ***Results:*** The main statements reached by the assembly were as follows: *(1)* Rinsing with chlorhexidine is highly recommended before and after implant surgery to minimize the bacterial load. *(2)* A single dose of antibiotics in straightforward cases is recommended. *(3)* In complex cases (long surgical time, regeneration procedures), it is advisable to continue the antibiotic administration. ***Conclusion:*** This Consensus Conference advocates the administration of a unique dose of antibiotics in straightforward implant cases combined with the use of chlorhexidine. *Int J Oral Maxillofac Implants 2021;36:103–105. doi: 10.11607/jomi.8264*

Keywords: antibiotics, dental implants, surgery

Postoperative infections are recognized as possible reasons for osseointegration failure.[1] In implant dentistry, one of the major problems is to limit as much as possible the microbial contamination of the surgical field; therefore, constant monitoring of the perioperative oral microbioma could be a key factor to achieve success in the whole therapy. There are other aspects that influence the success of implant therapy, such as surgeon competence, the quality of dental implants, patients' habits, medication, the systemic and local conditions of the patients, as well as adequate oral hygiene and the patients' compliance.[2]

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Antibiotics prescription in case of implant placement has been used for many years; however, in recent years, the traditional protocols were questioned, and the topic has been addressed in several systematic reviews and randomized controlled trials (RCTs).[3–5]

The term "prophylaxis" has constantly had its clinical meaning misused, and therefore, it should be clarified. The term, in fact, means a prescription to be used when an infection is not present: short and ultrashort protocols consisting of a single preoperative dose (and, if necessary, a supplementary postoperative prescription). Conversely, the "treatment" is a longer therapy with the scope to cure an infectious disease.

Today, antibiotic resistance represents a relevant threat to health care.[6] The actual measures to counteract this threat include adopting restrictive prescription policies and conscientious protocols in order to prevent nosocomial diffusion of the resistant bacterial strains.[4]

Numerous studies confirmed the link between increasing antibiotic resistance and increasing antibiotic administration.[7,8]

Beneficial aspects of short and ultrashort antibiotic administration protocols could be clinically correlated

Table 1 Consensus Questions

Questions	Possible answers
Could the use of an antibiotic intake reduce the risk of early implant failure and peri-implant infection on healthy patients, in straightforward cases?	Yes No
What is the most effective molecule to be used as antibiotic prophylaxis, if any, in implant straightforward cases on healthy patients?	Amoxicillin Amoxicillin + clavulanic acid Others
What is the most effective and less harmful dosage to be used in implant straightforward cases on healthy patients?	2 g amoxicillin 1 hour preop Short therapy (prolonged for 3 days) Traditional therapy (prolonged for 6 days)
Which could be the recommended prescription time?	1 administration preop 1 administration preop, 1 administration postop Full dosage (6 days)
In case of amoxicillin allergy, which molecule is recommended?	Clindamycin or doxycicline Other
In case of straightforward implant surgery, should the patient be under an adequate plaque control at the time of the intervention?	Yes No
In complex cases (long surgical time, regeneration procedures), is it advisable to continue the antibiotic dosing after surgery?	Yes No
In these cases, how long would you recommend continuing the course of antibiotics?	Short therapy (prolonged for 3 days) Long therapy (prolonged for 6 days)
Could the use of an antiseptic solution reduce the risk of early implant failure on healthy patients?	Yes No
Which type of antiseptic would you recommend?	Chlorhexidine Others

to the reduced side effects on the gastrointestinal microflora. However, the use of an antibiotic produces alterations (dysbiosis) in the gastrointestinal microbiota.[9]

The aim of this Consensus Conference was to establish the necessity of an antibiotic prophylaxis and its dosage to reduce the risk of early implant failure in healthy (ASA 1 or 2), periodontally healthy patients, undergoing basic dental implant surgery (straightforward cases).

Additionally, the need for an antiseptic protocol, used before and after the implant surgery, was evaluated.

MATERIALS AND METHODS

Active members of the Italian Academy of Osseointegration (IAO), together with several worldwide-recognized key opinion experts in the field of microbiology, implant dentistry, and infectious diseases, participated at this Consensus Conference. Two systematic reviews were carried out, before the Consensus Conference, and their results discussed in order to give guidelines on the use of an antibiotic/antiseptic administration in dental implant surgery.

The focused question of the first systematic review was: "Is the use of antibiotics able to decrease both failure rate and peri-implant infections in healthy patients?"[5] The article research was carried out on MEDLINE via PubMed, Cochrane Central Register of Controlled Trials (CENTRAL), Scopus, and the Web of Science databases. The following combination of keywords was used: (((antibiotics OR antiseptics OR amoxicillin OR metronidazole))) AND ((("dental implant" OR implantology OR "oral implant")). Three hundred thirty-eight articles were screened, and nine of them were meta-analyzed.

The focused question of the second systematic review was: "Is the use of chlorhexidine formulations able to prevent complications in patients undergoing procedures of either oral surgery, dental implantology, and periodontology compared to treatment procedures in patients without chlorhexidine prescription?"[10] The article research was carried out on the same databases of the previous systematic review. The following combination of keywords was used: "chlorhexidine," "antiseptic," "oral surgery," "periodontal," "tooth extraction," "third molar," "periodontology," "implant," "implantology," "mouthwash," "gel," and "mouthrinse." Three hundred thirty-eight articles were screened, and nine of them were meta-analyzed. The main results of the presented systematic reviews suggested that a course of antibiotics results in the prevention of initial implant failures; however, no information can be given on postoperative infections and which is the best dosage and prescription time.[5] On the contrary, data are still insufficient on the

employment of chlorhexidine in periodontal and implant surgery. However, even if there is only one RCT on the employment of chlorhexidine in implant surgery, it can be speculated that the use of chlorhexidine might be highly recommended before and after implant surgery to minimize the bacterial load.[10] The results of the two systematic reviews were discussed on October 16, 2019, among the participants at the consensus meeting. After the discussion, consensus was achieved, by voting, on the 10 questions raised (Table 1).

RESULTS

As demonstrated in Table 1, the assembly supported the conclusion that adequate plaque control is preoperatively required, and a single administration of antibiotics (amoxicillin 2 g 1 hour before the intervention) in straightforward cases is recommended. In case of amoxicillin allergy, clindamycin (600 mg) is the most suitable alternative.

Rinsing with chlorhexidine is highly recommended before and after implant surgery to minimize the bacterial load.

In complex cases (long surgical time, regeneration procedures), it is advisable to continue the antibiotic administration.

DISCUSSION

The results of the Consensus Conference advocated the use of a single administration of antibiotic before a straightforward implant insertion.

The conclusions of the assembly were in accordance with the systematic reviews, with a meta-analysis and trial sequence analysis (TSA) of RCTs indicating that an antibiotic administered preoperatively or postoperatively during the implant therapy reduces initial implant failures; however, no information can be given on longitudinal consequences of this approach.

At the same time, although the second systematic review[10] failed to provide meta-analytic data on the effect of chlorhexidine following implant surgery, the use of antiseptic rinses or sprays was suggested during surgical phases for implant insertion by the assembly to minimize the risk of infection. This was in agreement with information derived from extractive surgery or periodontology.[10,11]

It is important to underline that both reviews employed TSA. This allows evaluation of the statistical power of the meta-analytic findings, consenting to determine if additional research on the topic is still needed. TSA on the first review confirmed at the implant level that the use of antibiotics is able to decrease the implant failure rate in healthy patients.

However, certain limits of the actual research must be acknowledged. RCTs on the use of chlorhexidine in implant dentistry are lacking, as previously mentioned.

The short- and long-term effects of different antibiotic administration on the bacterial resistance should be analyzed together with RCTs to determine the impact of single preoperative antibiotic administration on bone loss in the long term.

CONCLUSIONS

This Consensus Conference advocated the administration of a unique dose of antibiotics in straightforward implant cases combined with the use of chlorhexidine.

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