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Use of chlorhexidine, side effects and antibiotic resistance

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ABSTRACT

Several scientific works increasingly focus on the bacterial resistance caused by the prolonged use of antiseptics and antibiotics. Chlorhexidine is the most commonly used molecule in dentistry. There are many works that prove the effectiveness of Chlorhexidine, but its use is connected with collateral events. Massive use of Chlorhexidine would induce antibiotic resistance, for example for Klebsiella pneumoniae. Urticaria, severe rash, hissing breath, difficult breathing, cold sweats, light head feeling; swelling of the face, lips, tongue or throat are described during use of chlorhexidine. This medication can cause severe irritation or chemical burns in young children. Based on these considerations, the disadvantage risk of using these products should be carefully re-evaluated. The health of the oral cavity will be increasing re-evaluated and closely linked to human health.

Keywords: *Oral disinfection, Chlorhexidine side effects, antibiotic resistance, chlorexidine resistance.*

1. OPINION

Several scientific works increasingly focus on the bacterial resistance caused by the prolonged use of antiseptics and antibiotics.

Chlorhexidine is the most commonly used molecule in dentistry. There are many works that prove the effectiveness of Chlorhexidine [1], vice-versa the works that evaluate the side effects are poor.

The aim of this opinion is to analyze the situation through the position of the national agency of the American drug Drugs.com and ask a further question: do the use of chlorhexidine and long-term antibiotics determine the appearance of bacterial resistance increasingly difficult to fight?

First of all, it is good to remember that chlorhexidine was synthesized for the first time in 1950 in the laboratories of the I.C.I. L.t.d.

From the beginning, it was developed as an antiseptic of mucous membranes, skin, and wounds or as a preservative in pharmaceutical formulations of ophthalmic type, as well as in instruments disinfection procedures in the hospitals [2].

Moreover, a mouthwash version with an anti-pigment system has been developed, maintaining the effect of chlorhexidine unaltered.

This system consists of sodium metabisulphite and L- ascorbic acid [3]. Chlorhexidine is composed of hydrogen, carbon, chlorine and nitrogen atoms and is used in the medical field as Clorhexidine diclugonate.

According to a recent work appeared on Antimicrobial Agents and Chemotherapy, the journal of the American Society for Microbiology, the massive use of chlorhexidine would induce antibiotic resistance [4].

In particular, *Klebsiella pneumoniae* would become resistant to colistin (colymicin), antibiotic that is used for multiresistance.

According to this study some strains of *Klebsiella* exposed to chlorhexidine die, others survive in high concentrations of the disinfectant and others develop resistance to colistin.

"Being the chlorhexidine widely used in hospital", explains Mark Sutton of National Infections Service, Public Health, England, Salisbury, Great Britain, "this resistance may have important repercussions on the prevention of infections during admissions and during routine and emergency surgical interventions."

The problem is even wider if we think that the use of chlorhexidine is widespread also in the outpatient and in particular dentistry.

In addition to this work, it is extremely useful to remember the guidelines of the drug from Drugs.com, that dictates the rigid protocols on the use of chlorhexidine, of which we refer some steps:

Chlorhexidine gluconate can cause a rare but serious allergic reaction that can be life-threatening. The necessity of emergency medical assistance if it is highlighted: urticaria, severe rash, hissing breath, difficult breathing, cold sweats, light head feeling; swelling of the face, lips, tongue or throat. Do not give this drug to a child or adolescent without the advice of a doctor. This medication can cause severe irritation or chemical burns in young children.

Before taking this medicine, check if you are allergic to chlorhexidine gluconate. Do not give this drug to a child or adolescent without the advice of a doctor.

This medication can cause severe irritation or chemical burns in young children. Chlorhexidine gluconate is not approved

for use by anyone under the age of 18 [1]. It is not known whether this medicinal product will harm an unborn child. Tell your doctor if you are pregnant or plan to become pregnant. It is not known whether chlorhexidine gluconate passes into breast milk or if it may affect the breastfed child. The doctor must pay attention to the use during the phases of breastfeeding.

The activity of chlorhexidine is inhibited by surfactants contained in many toothpastes, so it is recommended to use them at least 30 minutes away[5]. Furthermore, for its best efficacy, food, drinks, and smoking should be avoided for at least one hour after use.

Chlorhexidine is absorbed in the gastrointestinal tract, eliminated via the fecal route (90%) and less than 1% through the urine. According to some works, its absorption in the mucous membranes is not related to the concentration of intake but to the duration of contact with them [5].

The latest results of Cochrane show that chlorhexi dine, alt hough effe cti ve in reduci ng inflammation of bacterial origin, can induce resistance, and after 4 months of its suspension, the oral ecosystem returns to the starting point..

2. CONCLUSION

Perhaps its management should be rethought in quantitative terms, in terms of duration of treatment and its use should be reassessed based on the side effects.

One of the most interesting ways is to try to develop a concept of oral symbiosis, where "non- pathogenic bacteria" occupy space for pathogens by restoring a proper balance of the microbial population.

Oral diseases are an important problem for public health since an altered balance of the oral biome can induce both local (periodontal) and district (heart disease, respiratory or diabetes complications, atheromatous plaques, etc ...) pathologies [6].

The oral microbiota is actually a complex microbial biofilm containing over 750 different bacterial species that involves the entire oral cavity. The development of resistant populations resulting from the indiscriminate use of antiseptic substances can induce secondary systemic effects that can deeply affect individual's health.

Based on the reconsiderations, the advantage/disadvantage risk of using these products should be carefully re-evaluated. The health of the oral cavity will be increasingly re-evaluated and closely linked to human health.

3. REFERENCES

[1] Chlorhexidine Official FDA information, side effects and uses., Drugs.com, Medline Industries Inc., April, **2016**.
[2] Seymour S. Block., Disinfection, sterilization, and preservation, Lippincott Williams & Wilkins, 321. ISBN 978-0-683-30740-5, **2001**.
[3] Cortellini P., Pini P.G., Tonetti M., et al., Chlorhexidine with an Anti Discoloration System after periodontal flap surgery: a cross-over, randomized, triple-blind clinical trial, J Clin Periodontol, 35, 614-620, **2008**.
[4] Wand M.E., Bock L.J., Bonney L.C., Sutton M., Mechanisms of increased resistance to chlorexidine and cross-resistance to colistin following exposure of Klebsiella pneumoniae clinical isolates to chlorexidine, Antimicrobical Agents and Chemoterapy, **2016.**
[5] Seymour Stanton Block, Disinfection, sterilization, and preservation, Lippincott Williams & Wilkins, ISBN 978- 0-683-30740-5, **2001**.
[6] Jia G., Zhi A., lai P.F.H., Wang G., Xia Y., Xiong Z., Zhang H., Che N., Ai L., The oral microbioma – a mechanistic role for systemic diseases, BDJ, 224, 447-455, **2018**.