

**P0390**

**Poster Session I**

**Basic science: biofilm treatment**

**ANTISEPTIC EFFECT OF HYPER-PURE CHLORINE-DIOXIDE ON BACTERIA AND BIOFILM**

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**Objectives:** Despite of the beneficial biocide properties of ClO<sub>2</sub> known from the 19<sup>th</sup> century, it is not commonly used in the dental practice, because current products have to be prepared before their application, the by-products are toxic and the ClO<sub>2</sub> generated this way is not stable. To avoid these problems a new membrane technology has been developed which is able to produce hyper-pure ClO<sub>2</sub> solution.

**Methods:** The antibacterial properties of hyper-pure ClO<sub>2</sub>, sodium hypochlorite (NaOCl), chlorhexidine gluconate (CHX) and Listerine were examined on selected common oral pathogen microorganisms (*Streptococcus mutans*, *Lactobacillus acidophilus*, *Enterococcus faecalis*, *Veillonella alcalescens*, *Eikenella corrodens*, *Actinobacillus actinomycetemcomitans*, *Candida albicans*) and on dental biofilm *in vitro*. Antimicrobial activity of oral antiseptics was compared to the gold standard phenol. Furthermore, dental plaque was collected from healthy patients. Massive biofilm was formed and its reduction was measured after treating it with mouth rinses for 1 or 5 min. The biofilm disrupting effect was measured by photometer after dissolving the crystal violet stain from biofilm.

**Results:** The results have showed that hyper-pure ClO<sub>2</sub> solution is more effective than other currently used disinfectants in case of aerobic bacteria and *Candida* yeast. In case of anaerobes its efficiency is similar to CHX solution. All tested oral rinses eliminated the *in vitro* formatted biofilm significantly compared to saline control at every investigated time points. The biofilm dissolving effect of hyper-pure ClO<sub>2</sub> was significantly higher compared to Listerine after 1 and 5 min as well and to CHX after 5 min impact. There was no significant difference among the 1 and 5 min results of the tested solutions.

**Conclusion:** Hyper-pure ClO<sub>2</sub> has a powerful antimicrobial and biofilm dissolving effect compared to the antiseptics widely used at present, therefore hyper-pure ClO<sub>2</sub> may be a new promising preventive and therapeutic adjuvant in oral care and dental practice.