

3种口腔用臭氧水生成装置性能的研究

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【摘要】目的 研制口腔用的臭氧水生成装置, 检测其生成臭氧水的安全性、稳定性和杀菌效果。**方法** 制造3种口腔用的臭氧水生成装置的样机, 分别检测生成臭氧水的浓度、pH值、溴酸盐和亚硝酸盐含量, 以及臭氧气体泄露情况、臭氧水中细菌的含量及通过试管内定量杀菌试验检测臭氧水的杀菌率。**结果** 成功制造了3种口腔用臭氧水的生成装置——臭氧漱口水器、臭氧刷牙器、氧气源臭氧冲洗机, 可在水温18~28℃范围内生成浓度分别为0.56~1.29mg/L、0.38~0.50mg/L和1.8~3.2mg/L的稳定溶解的臭氧水, 无气体臭氧泄漏。并且无论臭氧水浓度高低, 水均呈中性, 溴酸盐和亚硝酸盐的含量也低于国家饮用水标准, 且对自来水有天然杀菌作用, 生成臭氧水为无菌水。体外的试管内杀菌实验证实3种装置生成的臭氧水是一种高效、快速的杀菌剂。**结论** 研制的口腔用臭氧水生成装置可以制备出安全、稳定且具有高效杀菌作用的臭氧水。

【关键词】 臭氧水 口腔 安全性 杀菌作用

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A comparative study on characterization of three apparatus for producing ozonated water in dental application

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【Abstract】Objective The aim of this study was to design three apparatus for producing ozonated water in dental application, and investigate the safety, stability and bactericidal action of ozonated water *in vitro*. **Method** Three apparatus for producing ozonated water were manufactured for dental application. The concentration of dissolved ozone, pH, bromate and nitrite were measured respectively. Possible leakage of gaseous ozone of these devices was monitored. Finally, *in vitro* bactericidal action of ozonated water produced from these devices was investigated. **Result** Three apparatus for producing ozonated water were successfully manufactured for dental application, including ozone mouthwash maker, ozone toothbrush maker and ozone water jet oral irrigator. These devices were able to make stable ozonated water with a range of dissolved ozone concentration of 0.56-1.29mg/L, 0.38-0.50mg/L and 1.8-3.2mg/L respectively at 18-28℃. No leakage of gaseous ozone was detected. The levels of bromate and nitrite from ozonated water samples with various ranges of dissolved ozone concentration were 10-100 fold lower than Chinese national standard. All ozonated water samples made from tap water had neutral pH and contained no detectable bacteria. *In vitro* bactericidal studies indicated that the ozonated water made by these devices was an effective bactericidal agent for dental application. **Conclusion** These apparatus for producing ozonated water were able to safely make stable and effective bactericidal ozonated water for dental application.

【Key words】 Ozonated water Oral cavity Safety Bactericidal action

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