BACTERICIDAL EFFECTS OF LOW TEMPERATURE ATMOSPHERIC PRESSURE PLASMA ON *PORPHYROMONAS GINGIVALIS**

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Purpose: The biomedical application of low temperature atmospheric pressure plasma (LTAPP) is a collaborative interest for engineering, medical, dental and biological researchers. This laboratory study tested whether LTAPP can limit growth of *Porphyromonas gingivalis,* a periodontal pathogen strongly associated with periodontal disease, disease progression, and refractory periodontitis. **Methods:** After extensive pilot trials, the study consisted of 24 agar plate samples of *P. gingivalis*- 20 samples were exposed to LTAPP at 5, 7, 9 and 10 minutes and 4 control samples were exposed to helium gas only. Immediately after exposures, the samples were incubated anaerobically for 72 hour at 37°C. After 72 hours, zones of inhibition were measured. **Results:** After 5, 7, 9, and 11 minutes of exposure times, results reveal a statistically significant difference in the bactericidal effect of the LTAPP on *P. gingivalis* compared to control bacteria not exposed, as measured by zone of inhibition (cm) ($p<0.0001$). Differences in the bactericidal effects were significant for each pair of consecutive time points: 5 minutes verses 7 minutes, 7 minutes verses 9 minutes, and 9 minutes verses 11 minutes ($p= 0.0360$, $p= 0.0009$, and $p<0.0001$, respectively).
Conclusions: LTAPP has a significant dose related bactericidal effect on *P. gingivalis*, as measured by zone of inhibition.

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