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研究題名：Research on Relationship between Maternal Periodontal Disease and Adverse Pregnancy Outcomes Using Mouse Model

目　的：

Periodontal disease is traditionally recognized as local periodontal tissue's inflammation, associated with alveolar bone loss, which leads to tooth exfoliation eventually. Recently, epidemiological and interventional studies have come to reveal a link between periodontal disease and systematic diseases, such as cardiovascular disease, preterm delivery of low birth weight（PTLBW）, diabetes mellitus, respiratory infection, and osteoporosis. *Porphyromonas gingivalis*（*P. g.*）, which is a gram-negative anaerobe, is considered to be the most fatal pathogen in chronic periodontal disease. Moreover, it has been detected in amniotic fluid and placenta tissue of preterm labored pregnant women. Based on those studies, we hypothesized that *P.g.* should reach placenta along the maternal circulation to establish colonies there and then provoke local immune response, which might become the reason of PTLBW. However, the evidence and mechanism between *P. g.* involved periodontitis and PTLBW remain under establishment. Therefore, a mouse model that best able to mimic periodontal diseases pregnancy women is demanded to demonstrate our hypothesis and provide a clue for new therapy.

対象および方法：

1. The preliminary investigation of in vivo experiment has been completed. I set 9-wks old C57Bl/6J mice into experimental and control group. For the experimental group, *P.g.* was filled into the root canal of their upper first molar after dental burr drilling while nothing was done to the control group. It took 4weeks until inflammation reach peri-apical area. Therefore, mice in each group are mated at 4wks post-infection and they were sacrificed at gestational day（gd）15.
2. RT-PCR/ELISA was used to check expression/secretion of cytokines and chemokines. Total RNA was extracted from gd15 placenta and serum was collected from maternal aorta.

結果および考察：

RT-PCR results demonstrate increase in transcription of MCP-1, MIP-2, TNF-a, and Toll-like Receptors like TLR2, TLR4, TLR5, and TLR9 in the *P.g.* treatment group compared to the non-treatment one（Fig. 1）. However, enzyme-linked immunosorbent assay（ELISA）

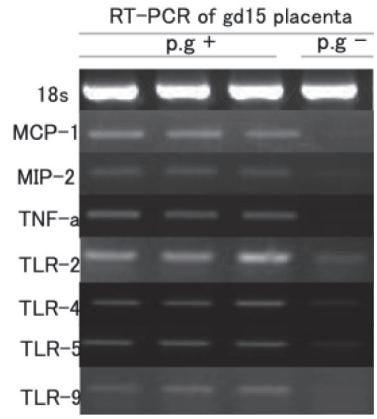


Fig. 1 PCR result of gd15 placenta. P.g + stands for P.g treatment (n = 3) and P.g-is for negative control (n = 1). 18s is used for internal control.

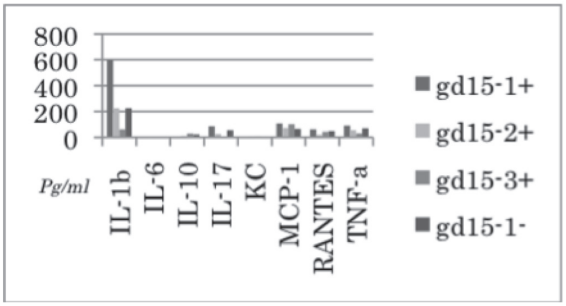


Fig. 2 ELISA analysis of gd15 serum. gd15-1 +, 2 +. 3 + is for p.g, treatment group and gd15-1-is for non-treatment one.

failed to detect a significant difference between the two groups (Fig. 2).

This preliminary investigation indicates that even 4weeks after treatment, peri-apical infected periodontitis truly up-regulates cytokines and chemokines expressions in mouse placenta tissue, though their protein level in serum did not show us with a clear report. Nevertheless, it may support out hypothesis that *P.g.* establishes colonies in placenta and interfere immune response there to cause PTLBW, but not only the cytokines and chemokines through blood circle do. A lot remain needed to prove it and to carry out to meet my research plan.