Effects of Clindamycin on Silkworm Larvae *Bombyx Mori* Model Infected With *Porphyromonas Gulae*

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Objectives: *Porphyromonas gulae* is an animal periodontal pathogen that possess fimbriae classified into three genotypes based on the diversity of *fimA* genes encoding FimA. Accumulated evidence suggests that *P. gulae* strain with type C fimbriae is more virulent as compared to those with other types. However, the interaction between *P. gulae* infection and toxicity in an *in vivo* model has yet to be investigated. The present study examined the inhibitory effects of clindamycin on the toxicity of *P. gulae* infection in silkworm larvae.

Methods: *P. gulae* strains ATCC 51700 (fimA type A), DO40 (fimA type B), and DO49 (fimA type C) were employed. Various dilutions (0.005 to 0.4 µl/ml) of each antimicrobial agents were prepared with trypticase soy broth and added to 96 well plates, followed by seeding with bacterial suspensions. After incubation, absorbance was measured at 595 nm using a microplate reader to assess bacterial growth. Silkworm larvae were injected with a bacterial suspension or antibiotics solution, and survival was noted every 12 h.

Results: All silkworm larvae died within 144 h of infection with DO49, while at least 50% of those infected with 51700 or DO40 survived. Clindamycin treatment showed a significant dose-dependent inhibitory effect on DO49 growth, resulting in increased survival in a dose-dependent manner.

Conclusions: These findings suggest that *fimA* genotypic variations have effects on *P. gulae* virulence, which is inhibited by clindamycin.

Perioperative Oral Bacterial Population in Patients Undergoing Hematopoietic Cell Transplantation

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Objectives: Streptococci are commonly found in the bacterial flora in oral mucosa. In patients undergoing hematopoietic cell transplantation (HCT), that flora may undergo alterations, as a variety of antibiotics are generally used to treat various infectious conditions that occur in patients with neutropenic conditions. As a result, severe gingivitis is commonly seen in allogenic HCT. Gingivitis is the most common periodontal disease occurring in children and its primary etiological factor is considered to be bacterial plaque. In the present study, we examined oral bacterial populations before and after HCT to clarify causative microorganisms.

Methods:
This study was approved by the Ethical Committee of Okayama University Graduate School of Medicine, Dentistry, and Pharmaceutical Sciences. Informed consent for collection of specimens and examinations for oral bacteria was obtained from each subject. First, subgingival dental plaque specimens were collected from the buccal side of the lower and upper canine in 3 patients (10.5-13.7 years old) during a perioperative clinical examination. Next, bacterial DNA was extracted from the specimens and PCR analyses were performed to detect 6 selected oral streptococci and 10 selected periodontopathic species using specific primers for each.

Results: Oral streptococci were detected in only 1 subject. As for periodontopathic species, the most frequently detected after HCT was *Capnocytophaga sputigena*, followed by *Prevotella nigrescens*. In contrast, *Porphyromonas gingivalis*, *Tannerella forsythia*, *Treponema denticola*, and *Actinobacillus actinomycetemcomitans* were not detected in any of the subjects.

Conclusions: Our results suggest that presence of periodontopathic species is a possible risk factor for development of gingivitis. Thus, follow-up examinations as well as preventive approaches should be performed for affected patients.
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Glucan-binding Domain in GbpC of *Streptococcus Mutans* Contributes to Binding to Type I Collagen

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Objectives: *Streptococcus mutans* is a major pathogenic bacterium involved in the development of dental caries and also known to cause infective endocarditis. The organism produces multiple glucan-binding proteins (Gbps), which bind to molecules such as dextran. It has been reported that approximately 20% of *S. mutans* strains possess collagen-binding activity, which is regarded as advantageous for binding to exposed dentin. In our previous report, we identified the glucan-binding domain “DPTKTIF” located in the middle of GbpC. In the present study, we examined the binding activity of DPTKTIF to type I collagen.

Methods: Collagen-binding activities were examined using 96-well plates coated with type I collagen. In addition to the parental strain MT8148, we used a GbpC deletion strain (CD1) and its DPTKIF deletion mutant strain (CDGB4), each of which were separately added to wells in the plates and fixed with formaldehyde. After 3 h of incubation, adherent cells were washed and fixed with formaldehyde for 30 min. After washing, adherent cells were stained with crystal violet for 1 min, then acetic acid was added to dissolve the dye and absorbance at 595 nm was determined.

Results: The assays findings revealed that collagen binding activity was reduced by approximately half in the CD1 and CDGB4 strains as compared to that in MT8148.

Conclusions: The present results suggest that the DPTKTIF domain in GbpC functions in not only glucan-binding but also binding to type I collagen.

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Correlation Between Chemotherapy for Childhood Cancer and Dental Developmental Defects

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Objectives: Recent improvements in chemotherapy for childhood cancer have led increased survival rates, though its delayed effects, such as endocrine, metabolic, and growth disturbances, must be managed after cancer has been overcome. Several case reports in the dental field have described delayed effects in teeth, including microdontia, atypical root formation, and tooth aplasia. However, details related to development of such anomalies remain to be elucidated. In this study, we clinically investigated the correlation between chemotherapy and dental abnormalities in children.

Methods: The study protocol was approved by the Ethics Committee of Okayama University Graduate School of Medicine, Dentistry, and Pharmaceutical Sciences. The guardians of the patients approved their participation prior to the study. We analyzed 4 children who received chemotherapy from the age of 2 months to 2.5 years old (median: 1 year old) for neuroblastoma, acute lymphoid leukemia, or acute myelogenous leukemia. Evaluations of tooth abnormalities were performed using orthopantomographs obtained in each case.

Results: The mean period of chemotherapy for the 4 cases was 9 months (6 -15 months) with cyclophosphamide and busulfan primarily used. A missing second premolar was found in all 4 cases, while a missing first premolar was seen in 1 and a missing second molar in 2 cases, with microdontia and disturbed root development identified in 3 and 3 cases, respectively. Chemotherapy was administered to the patients from the ages of 2 months to 2.5 years old in every case, which corresponds to the tooth germ formation of the first (0-1.5 years old) and second (0.5-2.2 years old) premolars, as well as the second molar (0.7-2.7 years old).

Conclusions: The periods of chemotherapy administration corresponded to development of affected teeth, suggesting a relationship tooth abnormalities.