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PREVENTIVE INTERVENTION OF PIT FISSURE SEALANT TO REDUCE NEW DENTAL CARIES INCIDENCE IN THE STUDENT OF SUMBANGSIH PRIMARY SCHOOLS JAKARTA

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ПРОФИЛАКТИЧЕСКОЕ ПОКРЫТИЕ ЗУБНЫХ ФИССУР ДЛЯ СНИЖЕНИЯ РИСКА ВОЗНИКНОВЕНИЯ КАРИЕСА У СТУДЕНТОВ НАЧАЛЬНОЙ ШКОЛЫ СУМБАНДЖИ

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Risqa Rina Darwita, Iwany Amalliah. **Preventive Intervention of Pit Fissure Sealant to Reduce New Dental Caries Incidence in the Student of Sumbangsih Primary Schools Jakarta. Saratov Journal of Medical Scientific Research, 2010, vol. 6, № 2, p. 386-388.**

The limitation on dental personnel at local community Health Center to cover the performing on dental school health service, the prevention for dental caries disease in school children in Jakarta and other area of Indonesia are not successful yet. In order to reduce dental caries in school children, pit fissure sealant technique as a preventive intervention for dental caries prevention activities. The aim of this study to determine whether a pit fissure sealing teeth represents an effective method of decreasing the incidence of new dental caries, to gain the parents, teachers and Sumbangsih Education foundation acceptance on this new activity. Methods. The subjects were 7-11 year of age of 251 student of Sumbangsih Primary School, which located in Kemang, South Jakarta and Grogol, West Jakarta. Intra oral examinations and pit fissure sealing were done in the school dental clinic. The data were analyzed by Chi-square test. The results showed that, the number of student who receives pit-fissure sealant in primary school Kemang was 38%, and Grogol was 62%. The number of tooth with pit fissure sealant in 251 student was 825 tooth, however, the students who were received pit-fissure sealant age of 8 and 9 years old (40.36% and 43.39%) were higher then the other students of age 7, 10 and 11 years old. After 6 month evaluation, the occlusal sealant retention rates are including to, full complete retention in occlusal molar surface was 383 tooth had full retention higher significant than those of partial loss occlusant sealant retention (174 tooth). Nevertheless, the occlusal with complete sealant loos was significantly lower ($p<0.001$) than those of full occlusal sealant retention. The new decay was significantly decrease ($p<0001$) in all student, and almost 100% of parent of student were accepted the dental caries prevention through pit fissure sealant. Further, almost more than 50% of tooth was still having a complete full retention glass-ionomer sealant. Conclusions. These findings were described that pit fissure sealant technique as an intervention for dental caries prevention in Sumbangsih primary school student could prevent the expansion of initial decay.

Key word: pit-fissure sealant, dental caries, occlusal retention, and school children

Риска Рина Дарвита, Ивани Амалиа. **Профилактическое покрытие зубных фиссур для снижения риска возникновения кариеса у студентов начальной школы Сумбанджи. Саратовский научно-медицинский журнал, 2010, том 6, № 2, с. 386-388.**

Сокращение медицинского персонала в местных Центрах Общественного Здоровья с целью осуществления стоматологического лечения в школах Джакарты и других районах Индонезии и профилактики кариеса у детей все еще малоэффективно. Для снижения риска возникновения кариеса у школьников используется метод покрытия зубных фиссур в целях профилактики. В основе исследования лежит определение эффективности данного метода и возможности доказать родителям, учителям и представителям образовательного центра Сумбанджи необходимость его применения в рамках детских образовательных учреждений. 251 ребенок в возрасте 7-11 лет, обучающийся в начальных школах Джакарты в районах Кеманг, Южная Джакарта и Грогол, Западная Джакарта, был включен в исследование. Обследование ротовой полости и уплотнение зубных фиссур проводиолсь в стоматологических клиниках школы. Полученные данные были проанализированы методом хи-квадрат. Результаты показали, что данному методу лечения подверглись 38 % школьников из Кеманг и 62% из Грогол, в основном дети 8 (40,36%) и 9 (43,39%) лет. Количество зубов – 825, из них после 6 месяцев оценки состояния 383 зуба на окклюзивной молярной поверхности сохранили покрытие полностью, 174 – частично ($p<0.001$). Количество образования новых застойных областей снизилось ($p<0001$) у всех школьников, и 100% родителей одобрили исследуемый метод профилактики возникновения кариеса. 50% из всего количества зубов до сих пор сохраняют стеклянный ионосодержащий полимер. В заключение необходимо отметить, что данная методика профилактики кариеса в начальной школе Сумбанджи может способствовать предотвращению развития новых застойных областей.

Ключевые слова: профилактическое покрытие зубных фиссур, кариес, окклюзивное сохранение, школьники.

Introduction. Unlike many other countries in the world the prevalence of dental caries has increased in Indonesia. Data from Ministry of Health shows that since 1970 the average number of score Decay Missing Filling Tooth (DMFT) for 12 years' olds has risen from 2.30 in 1980 to 2.70 in 1990. While the prevalence dental caries disease of children age 8 years old was 45.2%, and 72.76% in children age 14 years old.[1] The other hand, reporting from health family oral health survey which describes that dental ache was in the 6th rank after general

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symptom of other disease in health center services [1]. Dental caries therefore is becoming a serious disability in Indonesia.

Darwita (2000) was carry out research about dental treatment need in the primary school students in Jakarta had indicates that the mean DMFS for 12 year of age group was 3.65 surfaces and the mean DMFT was 1.78 teeth. In addition, these conditions describes that the largest proportion of both tooth and surface indices for each group was the decayed component, which the untreated caries is accounted for a mean of 60.8 % of surfaces, 69.2 % of tooth, and 50 percent of all decayed surfaces are occlusal surfaces [2]. This reported clearly suggests that fissure sealant in particular, as like as substantial improvements in oral health for most people in the developed country during the 20th century, if introduced, as a part of a comprehensive program, would be a great benefit for Indonesian children.

However, Ministry of health of Indonesia as the policy-maker stated that one of the cause of oral health problem, such as the limitation on dental personnel at local community Health Center to cover the performing on dental school health service. Nevertheless, the main cause of the problem is the children are not a ware on oral health problem, which because of dental disease is behavioral disease. The condition gets even worse when the parents do not care about their children's oral health condition.

Therefore efforts to find an efficient and effective method for preventing widespread dental caries should be undertaken with same degree of urgency. An appropriate method of controlling dental caries taking into account on the economic of Indonesia circumstances would suggest to that primary preventive approach shall be taken. Such methods would include pit and fissure sealant is an effective preventive strategy, commonly used to protect permanent molars from decay. Pit and fissure sealants have been used for over 30 years and are approved by the American Dental Association, National Institutes of Dental and Craniofacial Research, and the American Public Health Association, and widely used as a non-operative preventive method in public dental health in several developed countries, the percentage of school-aged children with sealants has risen in recent years, as one goal of healthy people 2010 is to have 50% of children will receive dental sealants on their permanent molars [3-7].

The purpose of this study is to determine whether a fissure sealing teeth represents an effective method on decreasing the incidence of new dental caries, to gain the parents, teachers and Sumbangsih Education Foundation acceptance on this new activity.

Methods.

Components of the study design:

The type of problem-solving project is preventive intervention of Pit Fissure Sealant (PFS) on healthy permanent posterior teeth (first molars) in Sumbangsih primary school children. The subjects as an intervention group is 7-11 year of age, that will receive routine interventions, there are consist of screening examination, oral hygiene instruction, Pit and fissure sealing of first molar erupted with deeply pit & fissure. The screening examinations will be undertaken by calibrated examiners as dental students who were experiences in dental clinic work, which to record each subject's oral health status using the score of Decay Missing Filling Tooth (DMFT).

The dental examination

The subjects will be examined by dental students in the student's class room by using their table and chairs. The oral examinations use a sickle probe and mouth mirror attached to a fiber optic light source. In addition, standard procedures to prevent cross-infection will be followed including the use of disposable gloves and masks, and having instruments immersed in a solution of cold sterilizing solution for 20 minutes.

Dental Sealant and Dental Health Education

Before performing the research, all parents of subjects were gave the information about the benefits of dental sealant that will performed in their children, and the parents who were agree with dental sealant will sign in the inform consent.

The subject will receive dental health education program, there is including informing of the role of diet in dental caries initiation and progression, information about tooth brushing with fluoride toothpaste, and practice tooth brushing together at school. After all subjects perform tooth brushing together, they will get an intervention on indicated permanent molar for dental sealant by a conventional method sealant that is a sealant material was applied to the dried occlusal molar surface, after

The Data Management and Statistical Analysis

The data is stored in ASCII format. Before being analyzed, the data is converted into the appropriate statistical program with use the statistical software for PC window. All collected data were analyzing using Chi-square test.

Result. During the study period, the total number of 251 children, age 7-11 year was eligible in Sumbangsih Primary School. The students were provided dental services at Sumbangsih Primary School dental clinic. Figure 1 describes the total number of children who were receiving pit fissure sealant in Sumbangsih Primary School Kemang (38%) and Grogol (62%).

Table.1 describes the total number of tooth indicated for pit fissure sealant in 251 student was 822 tooth, the highest number tooth indicated for pit fissure sealant is belong to the student age 9 years old (358 tooth) and age 8 years old (330 tooth). The lowest number tooth indicated for pit fissure sealant is belong to the student age 11 years old (2 tooth) and the student age 10 years old (9 tooth).

The Figure 2, describe about the retention of dental sealant material for pit-fissure sealant in 822 tooth of children age 7-11 years old. In those figure indicated that 46 % of pit-fissure sealant was still have full retention is still higher significant ($p<0.001$) than those of partial loss on pit-fissure sealant material (21%). However, the occlusal tooth surfaces with full retention (46%) is still higher significant ($p<0.001$) compare to the tooth with complete loss on pit-fissure sealant material (30 %).

Table 2, indicated that the highest dental material sealant retention rates is found as a full retention in the children age 9 years old (21.17%), and follows by age of 8 years old (15.81%), and age 7 years old (8.75%). While the highest partial loss of sealant in occlusal first molar surface was found in children age 8 years old (11.56), this condition was still significant lower ($p<0.001$) compare to the full retention material of pit-fissure sealant in children age 8 and 9 years old. In addition, the occlusal with complete sealant loss in children age 8 and 9 years old were significantly lower ($p<0.001$) than those of the full retention material of pit-fissure sealant in children age 8 and 9 years old.

Table.3. describe that decay score in student of Sumbangsih Primary School in Kemang and Grogol age of 8 year were significantly decrease from 18 to 4 ($p<0.0001$).

While the parent of student in Sumbangsih Primary School almost 100% accept pit fissure sealant activities.

Discussion. The results obtained in this study are similar to those obtained by others, demonstrating that a

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Figure 1. The distribution of students as subject's research in Primary School of Sumbangsih in Kemang & Grogol

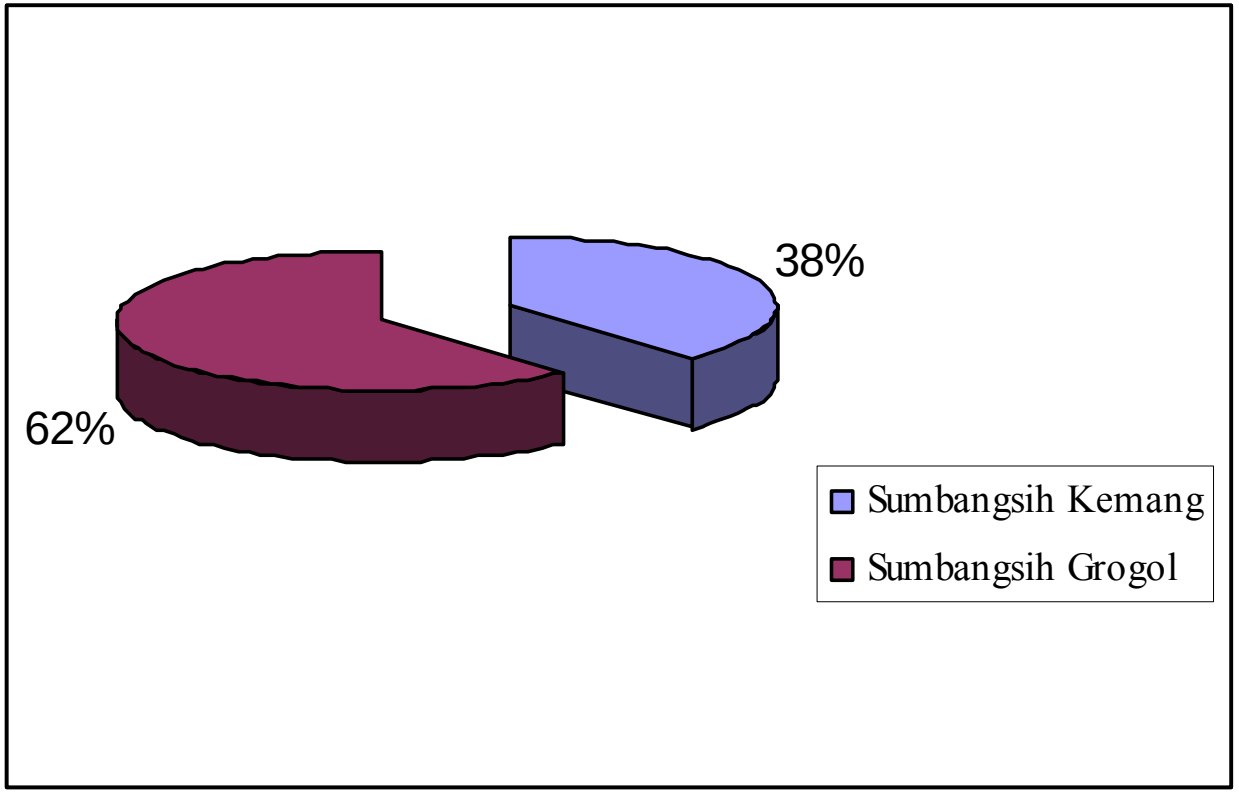
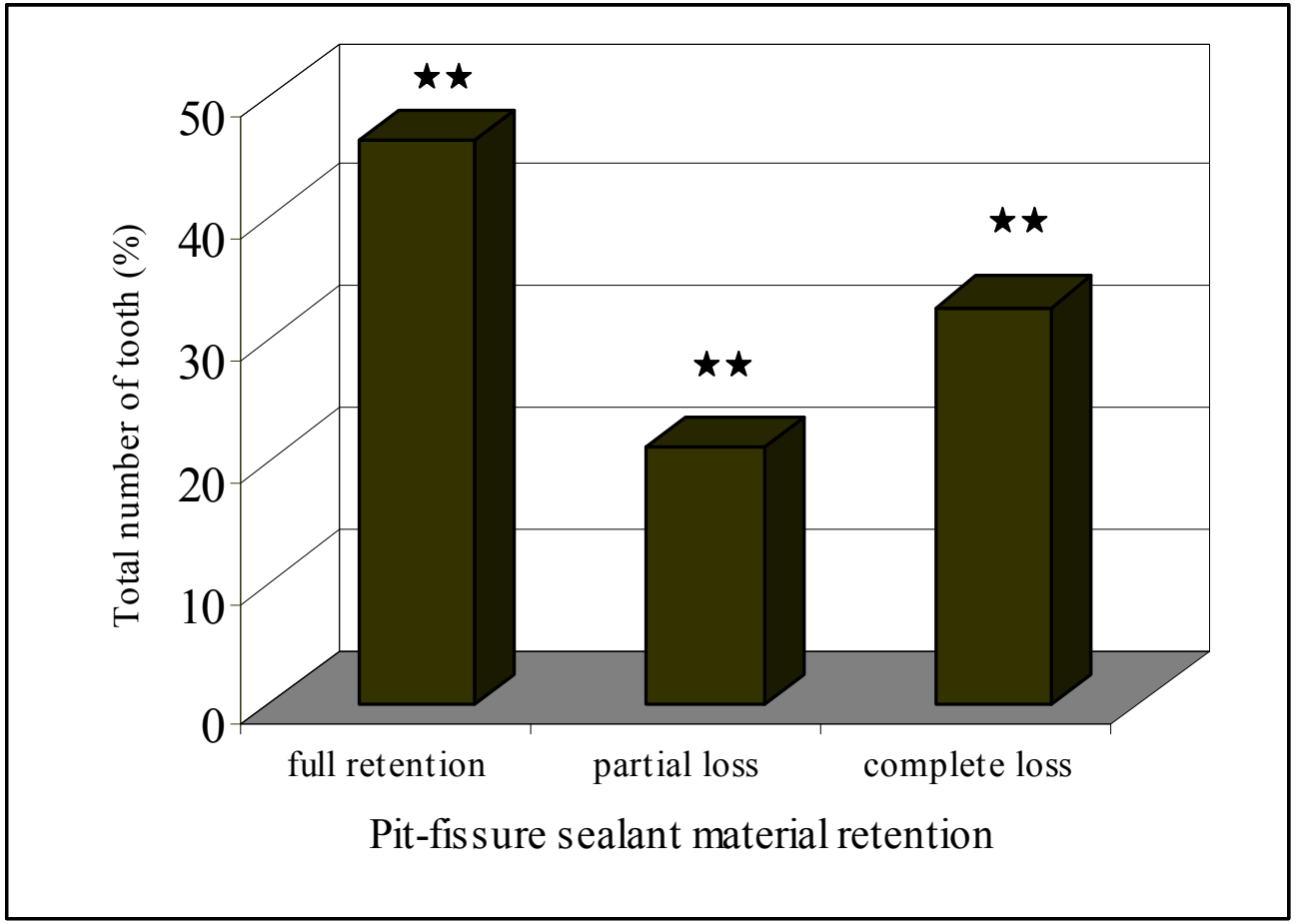


Figure.2. the Distribution of retention of pit-fissure sealant in 822 tooth of children age 7-11 years old



★★ : p< 0.001`

Table 1. Distribution of total number tooth indicated for Pit & Fissure sealant by age

No	Age (Year)	Number of tooth
1.	7	123
2.	8	330
3.	9	358
4.	10	9
5.	11	2

Table.2. the number of occlusal sealant retention rates in 822 tooth first molar permanent of student age 7-11 year in Sumbangsih Primary School

Age (year)	The number of occlusal sealant retention rates						
	full retention			partial loss		complete loss	
	∑tooth	%	P Value	∑tooth	%	∑tooth	%
7	72	8.75		22	2.68	29	3.53
8	130	15.81	<0.001	95	11.56	105	12.77
9	174	21.17	<0.001	55	6.69	129	15.69
10	4	0.49		1	0.12	4	0.49
11	0	0		1	0.12	1	0.12

Table.3. the number of Decay of student in Sumbangsih Primary School Jakarta after 1 year

Age (year)	Decay Score Sumbangsih Primary School Kemang and Grogol		
	First Screening	Second Screening	p Value
7	0	0	
8	18	4	< 0.0001
9	29	27	
10	4	4	
11	2	2	

pit fissure sealant can be used to prevent the expansion of initial caries lesions. The retention of the sealant almost high and similar than others. Recurrent caries was minimal and occurred in pit fissure areas in which some sealant loss had exposed a susceptible pit fissure. Although resealing was not used in this study, but several study describe that fluoride will release from the pit fissure material. This fluoride release is an important role in helping to heal remineralizes dentin and enamel [6-8].

The benefits of fluoride release from pit fissure material, following higher concentration of fluoroapatite. Fluoride will act as a catalyst for remineralization of demineralized tooth surfaces. Adjacent tooth surface in contact with pit fissure material will have potential to remineralize [8-12].

In the literature, the choice between the invasive and noninvasive pit fissure sealant material remains a matter of debate. In the present investigation the complete loss of pit fissure sealant from occlusal surface was considered that the adhesion of material to the wall of enamel was better, and the other side describe that the wall enamel was not dry [13-16]. There seems to be a need for defined guidelines for sealant application criteria and policy both locally and nationwide. The reduction of occlusal caries following dental sealant application is highly significant and dependent upon dental sealant retention, though the occlusal caries management may be improved by shifting the sealant policy from the traditional approach of prevention to interception, such as applying the sealants over detected or suspected enamel caries lesions instead of sealing sound teeth [13, 14, 17]. While in Table 3 indicated the mean decay was decrease significantly, one of the reason is the parents of student after receive the dental health education from dentist, they are looking for dental treatment and dental prevention due to pit and fissure sealant. Hence, dental health education and dental preventive method due to pit and fissure sealant which informed to parents can save money on healthcare expenditures by avoiding more labor intensive and invasive dental procedures such as restorative, endodontic, and surgical care [18-19].

Conclusion. This research result demonstrates that conservative cavity preparation with sealing for prevention is a successful technique, which conserves valuable tooth structure. The technique is particularly recommended, even though there is about 12.77%-15.69% were found as complete loss of sealant material. However, adequate isolation is the most critical aspect of the sealant application process. Therefore, placing sealants material in deep pit-fissure has to pay attention for controllable isolation. With these approaches, the utilization of dental sealants will improve the oral health among the next generation of school children in Indonesia.

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ОСОБЕННОСТИ РЕДУКЦИИ ЖЕВАТЕЛЬНОГО АППАРАТА У ЖИТЕЛЕЙ г. ПЕНЗЫ И ПЕНЗЕНСКОЙ ОБЛАСТИ

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CHARACTERISTICS OF MASTICATORY APPARATUS REDUCTION AMONG POPULATION OF PENZA AND PENZA REGION

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