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Effectiveness of gargle with extract oyster mushroom (pleurotus spp) to forming plaque in ecc patients (early childhood caries)

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Abstract

Objective: This aims to look at the effectiveness of gargling with extract oyster mushroom (pleurotus ostreatus) on forming plaque in Early Childhood Caries (ECC) patient.

Material and Methods: This study was conducted in Sudiang Asri Islamic kindergarten children in April-May 2018. This study used a pretest posttest design with a control group. A total sample is 90 people suffering from ECC. The sample was divided into three groups, namely chlorhexidine gluconate 0.2%, aquadest sterile and solution of oyster mushroom extract concentration of 50%. The score was measured using the Grenee and Vermillion methods about before and after the intervention. Analysis data use SPSS version 22.0 for windows.

Results: The result of the independent t – test that showed different significant about before and after the treatment of oyster mushroom extract (pleurotus ostreatus) ($p<0,05$). The result of index debris on chlorhexidine gluconate 0,2% in the pretest of 1.681 ± 0.538, and in the post test of 1.486 ± 0.429. Debris index result on sterile aquadest in the pretest was 1.492 ± 0.498 and in the post, test was 1.486 ± 0.429. While the debris index result in a solution of 50% oyster mushroom extract in the pretest of 1.813 ± 0.447 and in the post test of 1.513 ± 0.483.

Conclusion: Giving a gargle solution with oyster mushroom extract (pleurotus ostreatus) can inhibit dental plaque.

Keywords: Dental plaque, Early Childhood Caries (ECC), Oysters mushroom extract (pleurotus ostreatus)
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Introduction

Health of dental and oral is one aspect of body health that cannot be ignored. However, in this fact, there are many problems in dental and oral, one of each is dental caries. WHO reports that 60-90% children in the world have experienced about dental caries and the most commonly found in Asia and Latin America. The same thing was also shown by the CDC, they report on 2009-2010 many prevalence of dental caries in 3-5 years old was 14,4%, 6-9 years at 17%. In Indonesia, the prevalence of dental caries shown a high number of 73%.[1]

Early childhood caries (ECC) is a primary problem that happens in babies and children which can affect to health and progress child's teeth. The American Academy of Pediatric Dentistry (AADP) defines ECC as the presence of one or more carious teeth, that revoked because of caries or the surface of deciduous teeth that patched in children aged <71 months.[2] The prevalence and severity of dental caries in children under 5 years of age in some countries is quite high. In Indonesia, in 2001. The prevalence of caries in children aged 3-5 years old in DKI Jakarta was 81.2%. The prevalence of caries in children under five years old was around 90.05%.[3]

Caries that occurs because of an imbalance between the demineralization and remineralization processes which is influenced by four main factors, there is a host, substrate, time and microorganism. The most dominant microorganism are streptococcus bacteria. Dental caries lesions happen from ecological shifts and metabolic activity biofilm (dental plaque).[4]

Plaque is a soft deposit that have a grayish or yellow soft colored that attached to the surface of the tooth.[5] The effort can be done with gargle, the benefit use gargle it can inhibit the formation of dental plaque be quickly and easily. Chemical substance that used have an antiseptic or anti – bacterial properties which are useful to inhibit plaque.[6] This content can be found in plants, one of them in oyster mushroom (pleurotus Ostreatus). Most Indonesia people only use oyster mushroom as an ingredient food because they have high nutrion and have antibacterial and antioxidant bioactive contents which can inhibit the growth of streptococcus bacteria such as terpenoids, steroids, polyphenols, alkaloids, lectins, nucleotides and flavonoids.[7] Based on this the authors are interested in conducting research on " The effect of gargling solution of oyster mushroom (Pleurotus spp) on dental plaque formation in patients with ECC" by using 50% a concentration.

Material and Methods

The type of research used were laboratory and field experiments using pretest posttest with the control

Table 1. Distribution of the characteristics of the study

Characteristic		Group						Total	
		Aquadest steril		Chlorhexidine Gluconate 0.2%		Extract Oyster Mushroom (pleurotusspp) 50%			
		n	%	N	%	n	%	N	%
Age (Year):	4	1	3.3	1	3.3	3	10.0	5	5.6
	5	11	36.7	8	26.7	23	76.7	42	46.7
	6	18	60.0	21	70.0	4	13.3	43	47.8
Gender	Man	21	70.0	19	63.3	21	70.0	61	67.8
	Woman	9	30.0	11	36.7	9	30.0	29	32.2

Table 2. The difference of effectivity of solid outflow extract oyster mushroom (pleurotus spp) based on the value of dental and mouth hygiene

Characteristic		Group						Total	
		Aquadest steril		Chlorhexidine Gluconat 0.2 %		Extract Oyster Mushroom (pleurotusspp)50%			
		n	%	n	%	n	%	n	%
Pre Test :	Good	9	30.0	3	10.0	3	10.0	15	16.7
	Medium	21	70.0	27	90.0	27	90.0	75	83.3
Post Test :	Good	2	6.7	5	16.7	7	10.0	14	15.6
	Medium	28	93.3	25	83.3	23	76.7	76	84.4

Table 3. Debris index measurement results

Group	Debris Indeks (DIS)			P value
	Pre Test (Mean ± SD)	Post Test (Mean ± SD)	Difference Mean	
Aquadest steril	1.492 ± 0.498	2.108 ± 0.434	-0.616	0.00
Chlorhexidine Gluconat 0.2 %	1.681 ± 0.538	1.486 ± 0.429	0.195	0.00
Extract Oyster Mushroom (pleurotusspp) 50%	1.813 ± 0.447	1.513 ± 0.348	0.301	0.00

group design in 90 children with ECC. This research was conducted in Sudiang Asri Islamic Kindergarten from April-May 2018. 90 samples were divided into three groups there is 0.2% clorhexedine gluconate as a positive control, sterile aquadest as negative control and a solution of 50% oyster mushroom extract. Oral Hygiene Index (OHIS) measurement that used is according to Grenee and Vermillion. Debris index measurement is measured before and after the intervention. Debris index examination result were collected, recorded and processing data and analysis by using SPSS version 22.0.

In the table 1 of sample characteristics, there are characteristics of age and sex. In the characteristics table of age, 4 years old there were 5 samples with a percentage of 5.6%, 1 sample in the negative control group, 1 sample in the positive control group, and 3 sample in the 50% oyster mushroom extract group. At the age of 5 years there were 42 samples with a percentage of 46.7% each of 11 samples in the negative control group, 8 sample in the positive control group and 23 samples in the 50% oyster mushroom extract group while at the age of 6 years there were 43 samples with a percentage of 47.8% each of 18 samples in the negative control group, 21 samples in the positive control group, and 4 sample in 50% concentration group of oyster mushroom extractin the table of gender characteristics, there are 61 samples of male sex with a percentage of 67.8% and 29 samples of female sex with a percentage of 32.2%

Based on table 2 it can be seen that the percentage of the amount before and after treatment in

Table 4. Calculus index measurement results

Group	Calculus Indeks (CIS)			P value
	Pre Test (Mean ± SD)	Post Test (Mean ± SD)	Difference Mean	
Aquadest steril	0.237 ± 0.091	0.237 ± 0.091	0	*
Chlorhexidine Gluconat 0.2 %	0.281 ± 0.083	0.281 ± 0.083	0	*
Extract Oyster Mushroom (pleurotusspp) 50%	0.233 ± 0.091	0.233 ± 0.091	0	*

Table 5. OHIS measurement results

Group	OHIS			P value
	Pre Test (Mean ± SD)	Post Test (Mean ± SD)	Difference Mean	
Aquadest Steril	1.524 ± 0.532	2.140 ± 0.468	-0.616	0.00
Chlorhexidine Gluconat 0.2 %	1.747 ± 0.494	1.551 ± 0.412	0.195	0.00
Extract Oyster Mushroom (pleurotusspp) 50%	1.868 ± 0.499	1.567 ± 0.404	0.301	0.00

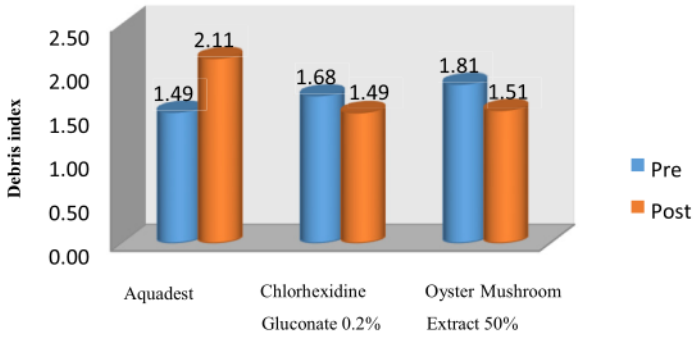

Figure 1. Average measurement of Debris index results before and after treatment

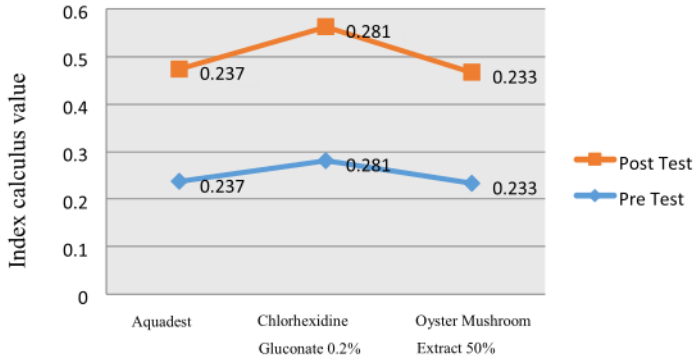

Figure 2. Average measurement of calculus index results before and after treatment.

the negative control group with the good OHIS category was 9 samples into 2 samples, while the medium OHIS category was from 21 samples to 28 samples. Futhermore, the percentage of the amount before and after the treatment in the positive control group with the good OHIS category, 3 sample into 5 samples while the medium OHIS category was from 27 samples to 25 samples. As well as the percentage of the amount before and after treatment in the solution group of oysters msuhroom extract with good OHIS category as many as 3 samples into 7 samples and the medium OHIS category was from 27 samples to 30 sample. Thus, there was a significant change in the effect of gargling solution of oyster mushroom extraxt with a concentration of 50%.

Based on table 3 it is known that the Debris index measurement result before and after treatment there was a significant decrease in debris except in the negative control group. The negative control group increased from 1.49 to 2.11 while for the positive control group there was a decrease in debris from 1.68 to 1.49 and there was a significant decrease in the treatment group of 50% concentration of oyster mushroom extract from 1.81 to 1.51 figure 1.

Based on table 4 it is known that the result of the calculus index before treatment and after treatment showed if no decrease about calculus (no significant) both in the negative and positive control group and the solution of group 50% oyster mushrom extract figure 2.

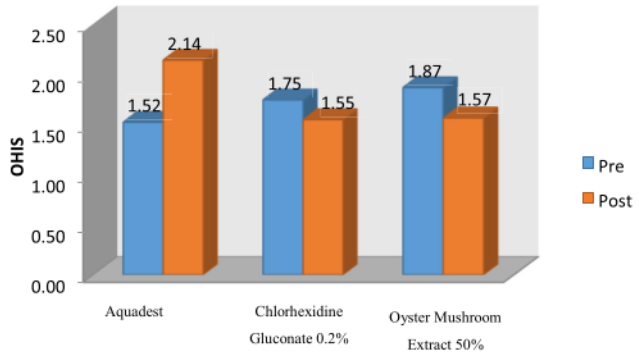

Figure 3. Average measurement results OHIS before and after treatment

Based on table 5 figure3 it is known that the result of measurement of OHIS before treatment and after treatment showed a significant decrease except in the negative control group. In the treatment of negative control group there was an increase from 1.52 to 2.14 while for the positive control treatment there was a decrease in the total OHIS from 1.75 to 1.55 and there was a significant decrease in OHIS in the treatment group of oyster mushroom extract from 1.87 to 1.57.

After calculating the statistical analysis, that showed a significant change from the result of paired T test which was carried out either negative control group => 0,05 which means not significant while in the treatment group positive control and solution of 50% oyster mushroom extract showed the result <0,05 which means the result obtained are significant. That is there is an influence on the treatment carried out. This shown that there is a significant decrease in the amount of plaque in the treatment intervention of oyster mushroom extract with a 50% concentration.

In the study, it was proven that the results is obtained in aquadest group > 0.05 which means that it was not significantly and different from the chlorhexidine gluconate 0.2% treatment group and 50% oyster mushroom extract solution which showed significant result <0.05 with the percentage value of OHIS for the negative control group there was an increase from 1.52 to 2.14 while for the positive control group there was a decrease in the OHIS from 1.75 to 1.55 likewise with 50% oyster mushroom extract group there was a decrease in OHIS from 1.87 to 1.57.

From the result of the study concluded that the effectiveness of oyster mushroom extract solution between the negative control group, positive group and 50% oyster mushroom extract group proved to be more effective in the oyster mushroom extract which can significally reduce the amount of plaque in the intervention of the specified time. in the tables and graphs of measurement result of the OHIS in the negative control group as well as in the positive control group that was announced by the child experiencing ECC.

Discussion

Research has been conducted on the effectiveness of oyster mushroom extract methods in the difficulty of plaque formation in children who have an experience ECC or under 71 months. Sample was conducted on Asri Sudiang Islamic Kindergarten student who entered according to the inclusion criteria which had a minimum of 2 caries.

Plaque is a grayish or yellow soft deposit that is firmly attached to the surface of the tooth.[5] The effort can be do with drug. Gargle can inhibit the formation of dental plaque be quickly and easily. Chemical substance that contained in gargle have antipathic or anti-bacterial that used for inhabiting plaque.[6]

The result of research conducted on 90 samples showed that a 50% oyster mushroom extract concentration using 96% ethanol solvent could inhibit dental plaque. This happens because oyster mushroom contains Terpenoids, Steroids, Phenols, Alkaloids, Lectins, Nucleotides and Flavonoids which have antibacterial and antioxidant power.[7]

There have been previous studies on oyster mushroom extracts in maintaining freshness of meat by reducing the number of microorganisms, namely s. aureus and E. coli. Bioactive compounds that can act as antimicrobial compounds can be obtained by extraction. Extraction by solvent is carried out for get the compounds. Extraction does by maceration; this method can keep the extracted compound from being damaged because it is do at room. Antimicrobial activity can be affected by solvents and bioactive components dissolved. Extract oyster mushroom with ethanol solvent has better antimicrobial activity than extract oyster mushroom with methanol, xylene, benzene, ether and acetone to bacteria.[9]

The bioactive components of oyster mushroom as antibacterial are flavonoids and polyphenols. The mechanism of flavonoids as an antibacterial is to form complex compounds with extracellular and dissolved proteins so that they can damage the bacterial cell membrane and are followed by the release of intracellular compounds,[10] polyphenol can inhibits growing up bacterial by inhibiting the activity of protease enzymes, inhibiting enzymes in

the bacterial cell transport protein and digesting or inactivating the function of genetic material.[10]

The statement support the result of research conducted on children under 71 months in Asri Sudiang Islamic Kindergarten, and the result is relationship that significant about the effect of gargling solution of oyster mushroom extract with a 50% concentration in ECC with percentage value of OHIS for the negative control group there is an increase from 1.52 to 2.14 beside that the positive control treatment there is a decrease from 1.75 to 1.55 and there was a significant decrease in oral hygiene in the treatment group of oyster mushroom extract from 1.87 to 1.57.

From the result of this study concluded that the effectiveness of the oyster mushroom extract between the chlorhexidine gluconate group 0.2% and the solution group of 50% oyster mushroom extract which can significantly reduce the amount of plaque in the intervention time specified, it can be seen in the result table and graph OHIS measurement in the positive control group and a solution group of oyster mushroom extract that has gargle by ECC.

Conclusion

Based on the result of research conducted at Asri Sudiang Islamic Kindergarten in April-May 2018, it can be concluded that giving of oyster mushroom extract (pleurotus ostreatus) can inhibit dental plaque; The final result about plaque in the teeth that given of oyster mushroom extract (Pleurotus Ostreatus) were lower than those not given an oyster mushroom extract; The final result about the plaque in the teeth that given an oyster mushroom extract are more effective than chlorhexidine gluconate 0.2% inhibiting dental plaque. The next research is which must be done about the effect of giving influence to oyster mushroom extract with different concentrations and research about oyster mushroom in another form on inhibiting dental plaque.

Acknowledgment

None.

Conflict of Interest

The authors hereby declared no conflict of interest.

References

1. Ningsih A, Hutomo CL, Rahaswanti LWY. Description of tooth brushing behavior on the incidence of dental caries in elementary school age children in the working area of Sidemen Health Center, Sidemen District, Karangasem Regency. E-J Medika Udayana 2015;4: 1-8. (In Indonesia)
2. American Academy of Pediatric Dentistry. Policy on early childhood caries (ECC): classifications, consequences, and preventive strategies. Pediatr Dent 2011;33: 479
3. Sutjipto RW, Herawati, Satiti K. Prevalence of early childhood caries and severe early childhood caries in preschool children in Gunung Anyar Surabaya. Dent J 2014;47: 4. (In Indonesia)
4. Borutta Annerosa, Wagner M, Kneist S. Early childhood caries: A multifactorial disease. J OHDMBSC 2010;9: 405.
5. Azizah M, Widodo, Priyawan R. The effectiveness of brushing teeth with dental floss on decreasing plaque index. Dentino J 2014;2: 56-59. (In Indonesia)
6. Ladytama RS, Nurhapsari A, Baehaqi M. The effectiveness of a solution of lime extract (citrus aurantifolia) as a mouthwash on reducing plaque index in adolescents aged 12-15 years - A study at Nurul Islami Middle School, Mijen, Semarang. ODONTO Dent J 2014;1: 39-43. (In Indonesia)
7. Krishnamoorthy D, Sankaran M. Pleurotus ostreatus: An oyster mushroom with nutritional and medicinal properties. J Biochem Tech 2014;5: 718-726.
8. Saskiawan I, Sukarminah E, Lanti I, et al. Utilization of oyster mushroom extract (pleurotus spp.) in storage of chicken meat at room temperature (26°C). J Biol Indo 2017;13: 279-287. (In Indonesia)
9. Randhawa K, Richa S. Pharmacological importance of pleurotus sajor caju (Fr.) Singer. The Pharma Inn J 2017;6: 321-327.
10. Subagio M. Efektifitas infusa daun sirsak (annona muricata l.) Terhadap penurunan jumlah koloni lactobacillus. Yogyakarta.2014

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PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5