

Analysis on Oral Health Associated Diabetes

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Abstract. This study analyzed prosthesis condition of the patients according whether they have diabetes or not. It indicates that the patients with diabetes have more prosthesis. For the types of prosthesis of the patients with diabetes, fixed and partial dentures were most common and for the normal patients, most of them do not have prosthesis.

Keywords: Oral Health, Diabetes

1 Introduction

The westernization of life style and development of social economy make increasing in nationwide prevalence of diabetes from 1.5% in 1970s to nearly 10% in early 1990s 1).and the rates of disease are also increasing globally2) Estimates of diabetes-related deaths in Korea suggest highest across OECD countries. Diabetes-related deaths also turned out to be relevant to cerebrovascular disease, heart disease, and high blood pressure which are second, third, and tenth most common cause in death respectively3). Complications of diabetes are much more important problem than diabetes itself. Renopathy, retinopathy, neuropathy, peripheral blood vessel disorders and coronary artery disease are supposed to be main types in complications of diabetes and they also influence on oral health occurred as periodontal disease, candidiasis and dental caries4). Typically when we talk about oral health, we examine dental caries, periodontal disease, tooth loss and implant5). Among them, relation between diabetes and dental caries is reported in most research. Mattout reported the patients with diabetes show increasing periodontal tissue destruction such as gingivitis and bond-loss compared to normal patients6) and Tsai referred patients with diabetes are at higher risk of periodontitis in case of uncontrolled blood sugar level 7). Recently, however, some evidence indicates chronic periodontal disease leads diabetes 8).

This research is for oral health program development and solution search through oral health associated with diabetes analysis based on Korea National Health & Nutrition Examination Survey for patients with diabetes.

2 Methods

This research used the fifth source document, which adopted rolling sampling survey method in Korea National Health & Nutrition Examination Survey in 2010. The subjects of this research are 5905 people who checked whether they have diabetes or not in health survey. Statistics analysis method used SPSS 12.0. Overall analysis method used chi-square test that is used in oral condition of prosthesis condition associated with diabetes.

3 Results

3.1 Oral prosthesis condition in upper jaw associated with diabetes

In patients' with diabetes prosthesis condition, the wearing rate of dentures is the highest as 22% followed by 21.5% of partial dentures and 16.7% of fixed and partial dentures. Among the patients who don't have diabetes, 94.2% showed that they don't have prosthesis as well. The wearing denture rate of the group with diabetes is 97.5%, which is higher compared to the normal group. On the contrary, in the group that doesn't have diabetes; the non-existence rate of prosthesis is 89.2% that is more than 8 times higher than the group with diabetes. Whether either group had diabetes treatment or not, the difference between the two groups was not statistically significant.

Table 1 Prosthesis in Upper Jaw associated with having diabetes or not

		Prosthesis in Upper Jaw						Overall	P(df) Sig.
		Non-prosthesis	Single fixed denture	More than two fixed dentures	Partial dentures only	Both fixed and partial dentures	Whole dentures		
Having diabetes	N	N3711 %94.2%	708 88.2%	355 89.0%	230 78.5%	100 83.3%	271 77.2%	5375 91.0%	
	Y	N228 %5.8%	95 11.8%	44 11.0%	63 21.5%	20 16.7%	80 22.8%	530 9.0%	206.021(5) .000
	Overall	N3939 %100.0%	803 100.0%	399 100.0%	293 100.0%	120 100.0%	351 100.0%	5905 100.0%	
Diagnosed as diabetes	N	N1801 %89.2%	4 4.1%	0 0.0%	1 1.6%	0 0.0%	2 2.5%	1808 77.8%	
	Y	N218 %10.8%	93 95.9%	44 100.0%	63 98.4%	20 100.0%	78 97.5%	516 22.2%	1159.018(5) .000
	Overall	N2019 %100.0%	97 100.0%	44 100.0%	64 100.0%	20 100.0%	80 100.0%	2324 100.0%	
Diabetes treatment	N	N 38 % 16.7%	12 12.6%	2 4.5%	4 6.3%	1 5.0%	9 11.3%	66 12.5%	9.518(5)
	Y	N 190 % 83.3%	83 87.4%	42 95.5%	59 93.7%	19 95.0%	71 88.8%	464 87.5%	.090

Overall	N	228	95	44	63	20	80	530
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

3.2 Oral prosthesis condition in lower jaw associated with diabetes

For oral prosthesis condition in lower jaw, 93.2% of the normal group doesn't have prosthesis, shown as 9 times higher than the group with diabetes. However, it turns out to be the group without diabetes has 85.5% of partial dentures wearing rate and 74.6% of whole dentures rates which mean more than 7 times higher than another group. ($p < .000$) The group diagnosed with diabetes has 100% of co-existence of dental bridge and partial dentures, another 100% of partial dentures wearing rate and one fixed dental bridge existence rate and 96.2% of whole dentures rates which means more 9 times higher than the group that doesn't have diabetes. ($p < .000$).

Whether either group had diabetes treatment or not, the difference between the two group was not statistically significant just like in the upper jaw.

Table 2. Prosthesis in Lower Jaw associated with having diabetes or not

		Prosthesis in Lower Jaw						Overall	P(df) Sig.
		Non-prosthesis	Single fixed denture	More than two fixed dentures	Partial dentures only	Both fixed and partial dentures	Whole dentures		
Having diabetes	N	N3658	716	439	297	112	153	5375	
		%93.2%	90.2%	89.8%	81.8%	85.5%	74.6%	91.0%	
	Y	N265	78	50	66	19	52	530	135.276(5)
		%6.8%	9.8%	10.2%	18.2%	14.5%	25.4%	9.0%	.000
	Overall	N3923	794	489	363	131	205	5905	
		%100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Diagnosed as diabetes	N	N1805	0	1	0	0	2	1808	
		%87.7%	0.0%	2.0%	0.0%	0.0%	3.8%	77.8%	
	Y	N253	78	50	66	19	50	516	1022.566(5)
		%12.3%	100.0%	98.0%	100.0%	100.0%	96.2%	22.2%	.000
	Overall	N2058	78	51	66	19	52	2324	
		%100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Diabetes treatment	N	N47	5	2	5	1	6	66	
		%17.7%	6.4%	4.0%	7.6%	5.3%	11.5%	12.5%	
	Y	N218	73	48	61	18	46	464	15.054(5)
		%82.3%	93.6%	96.0%	92.4%	94.7%	88.5%	87.5%	.010
	Overall	N265	78	50	66	19	52	530	
		%100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

4 Discussions

As diabetes and periodontal diseases are chronic diseases that are prevalent all over the world, it is important to care and prevent these two relevant diseases.8) In case one cannot chew due to tooth loss, by wearing prosthesis, the function recovery should be considered. The basic purpose of this study is for developing program and

searching for solutions for oral care of the patients with diabetes by analyzing the fifth source document from Korea National Health & Nutrition Examination Survey. This study indicates the whole dentures wearing rates of patients with diabetes occupied 97.5% in upper jaw and 96.2% in lower jaw which is apparently high. Also, co-existence rate of false dentures and partial dentures and only-partial dentures existence rate appeared 95% in upper and lower jaw. This number refers that diabetes could be the directly influences tooth loss.

5 Conclusion

This study is for developing program and searching for solutions for oral care of the patients with diabetes by analyzing the fifth source document from Korea National Health & Nutrition Examination Survey having target 5905 people who checked whether they have diabetes or not. This study is concluded as follows:

1. Patients who do not have diabetes have 94.2% and 93.2% of non-existence rate of prosthesis in upper and lower jaw respectively compared to the patients with diabetes. ($p < .000$)
2. Patients with diabetes have more than 9 times higher prosthesis wearing rate compared to non-diabetes patients ($p < .000$).

Reference

1. Wild S, Roglic G, Green A, et al: Global Prevalence of diabetes: Estimates for the year 2000 and projections for 2030. *Diabetes Care* 27, 1047-1053(2004)
2. Ministry of Health and Welfare: The Korea National Health and Nutrition Examination. Korea Centers for Disease Control and Prevention: Cheongwon, (2012)
3. Statistics Korea: The 2010 Year cause of death statistics. Statistics Training Institute, Daejeon, (2012)
4. Choi JS, Lee MJ, Han SJ: The association between oral health behaviors and glycosylated hemoglobin in the patients with type 2 diabetes, *The Korean Academy of Oral Health*. Vol. 33(3), pp. 388-399(2009)
5. Mattout C, Bouchard P: Type 2 Diabetes and periodontal indicators: epidemiology in France 2002-2003. *J Periodontal Res*, vol.41, pp.253-258(2006)
6. Tsai C, Hayes C, and Taylor GW: Glycemic control of type 2 diabetes and severe periodontal disease in the US adult population. *Community Dent Oral Epidemiology*, vol.30, pp.182-192(2002)
7. Williams RC, Barnett AH, Claffey N, et al: The potential impact of periodontal disease on general health: a consensus view. *Curr Med Res Opin* vol.24, pp.1635-1643(2008)
8. Lin BP et al: Dental caries assessment as a predictor of metabolic control in young type 1 diabetes. *Diabetes Med* .vol.22 (3), pp.312-315(2005)