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Letter to the Editor

Genetic Polymorphisms in Serotonin Transporter *(5HTT)* and Catechol-O-Methyltransferase *(COMT)* On Dental Implant Loss–Pilot Project

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Dear Editor-in-Chief

In Brazil, the National Oral Health Survey revealed that tooth loss is still a very prevalent problem (1). Obviously, the negative impact on the quality of life of people with missing teeth is very great, triggering problems that affect their social behavior, so the substitution of lost dental elements by dental implants is considered a suitable way to return both aesthetics and physiology to these individuals. Despite the success of dental rehabilitation with dental implants, there are still cases of failure (2). Several factors may be associated with the dental implant loss, among them are the environmental factors and individual characteristics of each person, in this case, genetic factors gain importance.

Unsurprisingly genes associated with bone metabolism are among the candidate genes to be studied in cases of dental implant loss (3), but now it is assumed that genes associated with stress and anxiety may also contribute to this condition. In this case, genes like the catechol-O-methyltransferase (*COMT*) and serotonin transporter protein (*5HTT*) are candidates to be studied. Although *COMT* and *5HTT* have been previously studied and associated with painful conditions, stress and anxiety in adult populations (4), as far as we know, there were no studies associating these genes with dental implant loss.

So, the overall objective of this study was to investigate whether genetic polymorphisms in the *COMT* and *5HTT* are associated with dental implant loss.

This pilot project was conducted 19 subjects. Implant loss was assessed by clinical and radiological examination. Genomic DNA for molecular analysis was extracted from buccal cells (5). Genetic polymorphisms in *COMT* (rs4818 and rs174675) and *5HTT* (rs3813034 and rs1042173) were genotyped by real time polymerase chain reactions using the TaqMan assay. The polymorphisms were selected based on allele frequency. Genotype, allelic distributions in dominant and recessive models were analyzed using the Epi Info 7.2. From 19 subjects evaluated, 10 were affected by dental implant loss.

Table 1 summarize the genotype and allele distributions found in unaffected and affected individuals. There was an association between dental implant loss and rs174675 (P=0.00). This same polymorphism also had an association in the dominant model (P= 0.01). In the other polymorphisms there were no significant differences between the affected and unaffected individuals (P>0.05). We also investigated the possible association with specific alleles of the polymorphisms tested in dominant and recessive models (Table

2). The allele C of rs174675 in the dominant model was more present in the group that was not affected by dental implant loss (P =0.01) and appears to play a protective role against loss of implants. The other alleles of the other polymorphisms tested, both in the dominant model and in the recessive model, do not seem to be associated with the of implant loss.

Table 1: Genotype and allelic distribution according to phenotype in the subjects evaluated

Gene	*rs#*	*Groups*	*Genotype n (%)*			*P-value*	*Allele*		*P-value*
			Lost Implants						
COMT	4818		CC	CG	GG	0.25	C	G	0.94
		Unaffected	3(33.3)	5(55.6)	1(11.1)		11(61.1)	7(38.9)	
		Affected	5(50.0)	2(20.0)	3(30.0)		12(60.0)	8(40.0)	
	174675		CC	CT	TT	0.00	C	T	0.50
		Unaffected	2(22.2)	7(77.8)	0(0.0)		11(61.1)	7(38.9)	
		Affected	4(44.4)	1(11.1)	4(44.4)		9(50.0)	9(50.0)	
5HTT	1042173		GG	GT	TT	0.82	G	T	0.58
		Unaffected	5(62.5)	1(12.5)	2(25.0)		11(68.7)	5(31.3)	
		Affected	5(50.0)	2(20.0)	3(30.0)		12(60.0)	8(40.0)	
	3813034		AA	AC	CC	0.84	A	C	0.73
		Unaffected	4(44.4)	3(33.3)	2(22.3)		11(61.1)	7(38.9)	
		Affected	3(33.3)	44(44.4)	2(22.3)		10(55.5)	8(44.6)	

Table 2: Genotypic analysis of polymorphisms in dominant (Dom) and recessive (Rec) models

Gene	*#rs*	*Groups*	*Genotype n (%)*		*P-value*
			CC + CG	GG	
	4818	Unaffected	8 (88.9)	1 (11.1)	0.31
	(Dom C)	Affected	7 (70.0)	3 (30.0)	
			CG + GG	CC	
	4818	Unaffected	6 (66.7)	3 (33.3)	0.46
	(Rec G)	Affected	5 (50.0)	5 (50.0)	
			CC + CT	TT	
COMT	174675	Unaffected	9 (100.0)	0 (0.0)	0.01
	(Dom C)	Affected	5 (50.0)	5 (50.0)	
			TT + CT	CC	
	174675	Unaffected	7 (77.8)	2 (22.2)	0.31
	(Rec T)	Affected	5 (55.6)	4 (44.4)	
			GG + GT	GG	
	1042173	Unaffected	6 (75.0)	2 (25.0)	0.81
	(Dom G)	Affected	7 (70.0)	3(30.0)	
			TT + GT	GG	
	1042173	Unaffected	3 (37.5)	5 (62.5)	0.85
	(Rec T)	Affected	5 (50.0)	5(50.0)	
5HTT			AA + AC	CC	
	3813034	Unaffected	7 (77.8)	2 (22.2)	0.70
	(Dom A)	Affected	7 (70.0)	3(30.0)	
			CC + AC	AA	
	3813034	Unaffected	5 (55.5)	5 (44.5)	0.62
	(Rec C)	Affected	6 (66.7)	5 (33.3)	

Previous study investigated and found association between genetics polymorphisms and dental implant loss point to genetic factor that contribute to this condition (3). In the present study, despite its limitations, the investigation of these two genes was related to some evidence that *COMT* could contribute to dental implant loss etiology. In fact, to the best of our knowledge, this was the first research that investigates if genetic polymorphisms in *COMT* and *5HTT* are associated with dental implant loss.

Conflict of interest

The authors declare that there is no conflict of interests.

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