COMPOSITE RESIN RESTORATIONS OF NON-CARIOUS CERVICAL LESIONS IN PATIENTS WITH DIABETES MELLITUS AND PERIODONTAL DISEASE: PILOT STUDY

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ABSTRACT

Diabetes mellitus is a set of metabolic diseases characterized by hyperglycemia resulting from absolute or relative deficiency in insulin secretion by the pancreas and / or impaired insulin action in target tissues. Oral health maintenance through health care, as well as metabolic control are important measures for the overall health of diabetic patients. The objective of this study was to determine the relationship between biocompatibility of composite resin restorations with different nanoparticles, polishing in abfraction lesions in anterior and posterior teeth with periodontal tissues in patients with diabetes mellitus. We selected 20 patients - 10 patients with diabetes mellitus and 10 patients without diabetes mellitus-, but with a total of 30 restorations in each group receiving composite resin restorations, who were evaluated for periodontal purposes: Plaque Index, Gingival Index ; Probing Depth, Clinical Attachment Level and Bleeding on Probing. In addition, the restorations will receive assessments according to criteria for Marginal Adaptation, Anatomical Shape, Marginal Discoloration, ormation of caries, Post-operative Sensitivity and Retention. The total period was 90 days. The results showed a significant improvement in periodontal parameters assessed ($p < 0.05$) in both groups. With regard to assessments of the restorations, it was observed that there was no statistically significant difference ($p > 0.05$) among all criteria evaluated within the 90-day period. Thus, we conclude that in a short period (90 days) there is clinical biocompatibility of composite resin with nanoparticles restorations in abfraction lesions and periodontal tissues of patients with diabetes mellitus, regardless the type of polish these restorations receive.

Key-Words: *Diabetes mellitus - composite resin, periodontal disease - biocompatibility.*

RESTAURAÇÕES DE RESINA COMPOSTA EM LESÕES CERVICAIS LIVRES DE CÁRIE EM PACIENTES PORTADORES DE DIABETES MELLITUS E DOENÇA PERIODONTAL: ESTUDO PILOTO

RESUMO

Diabetes mellitus é um grupo de doenças metabólicas caracterizado pela hiperglicemia resultante da deficiência absoluta ou relativa na secreção de insulina pelo pâncreas e/ou na ação deficiente da insulina nos tecidos-alvos. A manutenção da saúde bucal, através de cuidados com a higiene, assim como o controle metabólico são de extrema importância para a saúde geral dos pacientes diabéticos. O objetivo deste estudo foi de obter a relação entre a biocompatibilidade das restaurações de resina composta de nanoparticulas com diferentes formas de polimento, em lesões de abfração em dentes posteriores e anteriores, com os tecidos periodontais de pacientes portadores de Diabetes mellitus. Foram selecionados 20 pacientes sendo 10 pacientes portadores de Diabetes mellitus e 10pacientes não portadores de Diabetes mellitus, mas com um total de 30 restaurações em cada grupo, que receberam restaurações de resina composta e que foram avaliados periodontalmente através: Índice de Placa; Índice gengival; Profundidade de sondagem; Nível de inserção clínica e Sangramento a sondagem. Além disso, as restaurações receberão avaliações quanto aos critérios de adaptação marginal, forma anatômica, descoloração marginal, formação de cárie, sensibilidade pós-operatória e retenção. O período total de realização do projeto foi de 90 dias. Os resultados demonstraram uma significativa melhora nos parâmetros periodontais avaliados ($p<0,05$) em ambos os grupos. Com relação às avaliações das restaurações pode-se observar que não houve diferença estatisticamente significante ($p>0,05$) entre todos os critérios avaliados no período de 90 dias. Logo, podemos concluir que em um período curto (90 dias) existe uma biocompatibilidade clínica das restaurações de resina composta de nanopartículas em lesões de abfração e os tecidos periodontais de pacientes portadores de Diabetes Mellitus, independente do tipo de polimento dessas restaurações.

Palavras-chave: *Diabetes mellitus - resina composta - doença periodontal - biocompatibilidade.*

INTRODUCTION

Diabetes mellitus is a set of metabolic conditions characterized by hyperglycaemia resulting from absolute or relative deficiency in the secretion of insulin by the pancreas and/or from the deficient activity of insulin on target tissues. Chronic hyperglycaemia caused by diabetes is related to long-term injuries, disfunctions and failure of seve-

ral organs, namely eyes, kidneys, nerves, heart and blood vessels[1]. Periodontal disease is primarily caused by bacterial plaque which may trigger off inflammatory processes and, consequently, loss of periodontal supporting tissues, which could, in turn, lead to the loss of teeth[2].

The presence of restorations close to the gingival tissues, namely restorations that have not attained an optimal polish or smoothness state, may accelerate the presence of bacterial plaque in the oral cavity. Some authors considered that direct restoration is advantageous for aesthetics, for facilitating the execution of anatomical contour and of proximal contact areas, for keeping a good reaction of the gingival tissue, apart from the fact that it does not require longer surgical times than necessary for the adaptation of steel crowns[3]. Thus, the presence of inadequate restorations or restorations made with materials with smoothness may contribute to the buildup of bacterial plaque and, consequently, to the development of periodontitis[4]. Periodontal disease induced by bacteremia/endotoxemia causes increases in pro-inflammatory cytokines such as interleukin-1 beta (IL-1β) and tumor necrosis factor alfa (TNF-α), which have been proved to produce alterations in the metabolism of lipids, thus leading to hyperlipidemia. Within this context, periodontitis may contribute to the increase in pro-inflammatory cytokins/serum level of lipids and, potentially, to systemic illnesses that may bring about chronic hyperlipidemia and /our increase in inflammatory mediators. Such cytokins may produce a resistance to insulin syndrome, similar to the one observed in diabetes, and trigger off the destruction of pancreas β cells, thus leading to the development of diabetes[2].

With the aim to streamline the finishing and polishing procedure and to improve the smoothness of restorations next to the cervical end, a one-step finishing and polishing system was recently launched, in which anatomical contour, finishing and polish procedures are carried out with the same tool[5]. It has already been mentioned that one-step systems were better or, at least, comparable to traditional multi-step techniques[6]. Thus, the purpose of this study is to evaluate the relationship between biocompatibility of periodontal tissues and restorations of composite resin with nanoparticles using different polishing practices, in cervical non-carious lesions, in patients with diabetes mellitus having periodontal disease.

MATERIALS AND METHODS

Twenty patients were selected: 8 men (3 diabetic/ 5 non-diabetic) and 12 women (9 diabetic / 7 non-diabetic), age range: 18-70, with 30 restorations in each group and with abfraction lesions in cervical regions of posterior or anterior teeth. Each diabetic patient had been under an anti-diabetic therapy for at least five years and during treatment no changes were made to such therapy during periodontal treatment.

Inclusion criteria: teeth needed to appear in normal position in the dental arch when subject to clinical exam made in vestibular, lingual/palatine, mesial and distal faces, and such teeth needed to have cervical injuries caused by abfraction as well as having only plaque-induced gingivitis, an evidence of the difficulty for reaching the area to be restored during hygiene practices. Exclusion criteria: non-diabetic mellitus patients could not show any systemic compromise. Besides, patients should have a negative history of antibiotic therapy during the prior six months and of anti-inflammatory treatment (steroids or non-steroids), in the three months prior to the study; a negative history of pregnancy; a negative history in the use of anti-contraceptives or any other form of hormone; a negative history in tobacco consumption or definitive interruption of smoking in, at least, the last 5 years; a negative history of periodontal treatment in the last 12 months.

Clinical Evaluation

The initial clinical evaluation was done by a single, previously trained, examiner who, through a periodontal probe n° 23 (Williams), determined:

1. SILNESS & LÖE Plaque Index
2. LÖE & SILNESS Gingival Index
3. Probing Pocket Depth: distance from bottom of gingival sulci up to the gingival margin at six points: mesio-vestibular, vestibular, disto-vestibular, disto-lingual/palatine, lingual/palatine and mesio-lingual/palatine of each evaluated tooth.
4. Clinical Level of Insertion: also determined in the same points of probing depth.
5. Bleeding during probing.

After the initial clinical trial, all the patients were subject to basic periodontal therapy, and were subsequently subject to the necessary restorations in the compromised teeth with non-carious cervical injuries. Patients were randomly divided into 2 groups, 10 patients per group, as shown in Table 1.

Table 1: Distribution of patients according to proposed treatments.

Group 1: Patients with no systemic problem	Basic Periodontal Treatment	Mechanical control (Modified Bass Technique + Dental Floss)	Restoration with composite resin + polishing of restorations	Maintenance Therapy
Group 2: Diabetic Patients	Basic Periodontal Treatment	Mechanical control (Modified Bass Technique + Dental Floss)	Restoration with composite resin + polishing of restorations	Maintenance Therapy

Afterwards, the corresponding instruction from mechanical control was given to each group, the same instruction for all the groups, as well as support periodontal therapy. The following stage was that of restorations of caries-free cervical injuries with composite resin with nanoparticles Filtek Z350 (3M ESPE) and a two-step conventional adhesive system (Single Bond/3M ESPE). The composition of the adhesive system and of the composite resin is shown in Table 2. All the restorations were made by the same, previously probed operator.

Each patient received at least two pairs of restorations for each of the polishings being evaluated. The size of restored lesions ranged from superficial lesions (less than 1 mm deep), often exhibiting sensitivity to cold, heat or to air jets, to larger lesions approximately 5 mm occluso-gingivally lesões maiores de aproximadamente 5 mm in the occlusive-gingival sense and approximately 2 to 3 mm deep.

Lesions were restored by a single operator and restorations were placed according to manufacturer's instructions: Preliminary prophylaxis with a slurry of pumice and water on a slow rotating rubber cup, shaping of bevel on the margin of the enamel (2 mm); complete isolation; prophylaxis with pumice and water; dentine is exposed to acid conditioning (15 sec.) as well as enamel (30 sec.); washing and drying; application of adhesive system as per manufacturer's instructions; 20-second photoactivation (Free Light/3M ESPE unit, 900 mW/cm^2); application of composite resin following incremental technique and 30-second photoactivation for each increment. Excess of composite resin was removed with an ultrafine diamond bur (KG Sorensen 1111 FF) in high rotation under highly refrigerated conditions. After seven days, finishing and polishing of restorations were made. For these procedures, tasks were divided into three sub-groups:

G1. Soft Lex discs (3M ESPE);
G2. Abrasive Burs, FlexiCups (Cosmedent);
G3. Abrasive rubber PoGo (Dentsply).

In sub-group G1, restorations were polished with discs impregnated with aluminum oxide in decreasing order of granulation (Soft-Lex/3M ESPE) with intermittent pressure and in slow rotation for 20 seconds. Prior to disc substitution, restorations were rinsed with air/water jets so as to remove any residue; they were dried with air jets and then polished

Table 2: Composition of materials used.

Materials	Composition	Manufacturer
Filtek Z350	Organic matrix: BisGMA*, BisEMA** Inorganic Matrix: Zirconium-silica - 0.6 to 1.4 µm, Nanoparticles of SiO2 – 20nm	3M ESPE
Single Bond	BisGMA, HEMA***, dimethacrylate, ethanol, water, an innovating photoinitiating system and a functional copolymer of methacrylate of polyacrilic and polyalkenoic acids	3M ESPE
Soft-Lex	Al2O3**** with granulations: Thick - 92-98 µm Medium - 25-29 µm Fine - 16-21 µm Ultrafine - 2-5 µm	3M ESPE
PoGo	Dimetachrylate polyurethane, conforoquinona, N-methyldiethanolomine, micro-particles of diamond and aluminium oxide. Granulation 7 µm.	Dentsply
FLEXI CUPS	Al2O3 with granulations: Médio (azul) Ultra-fino (cor-de-rosa)	COSMEDENT

*BisGMA - Bisphenol Glycidyl dimethacrylate
** BisEMA - bisphenol A – polyethylene glycol diether dimethacrilate
*** HEMA - 2-hydroxyethyl methacrylate

with another disc with a finer granulation. For subgroup G2, restorations were polished with abrasive points (FlexiCups/Cosmedent), firstly applying the blue point for 40 seconds; then, water jets for the removal of any residue; then, air jets for drying purposes and, finally, polishing with the pink edge for other 40 seconds. For subgroup G3, restorations were polished with the PoGo system, using a diamond disc for 30 seconds.

The average duration of each clinical procedure for diabetic patients was 1 hour.

Restored teeth were periodontically evaluated after 30 days, by a single evaluator previously gauged, that re-assessed the same indexes as described above. The same teeth were also evaluated after 30 days and 90 days for restoration assessment purposes. In Table 3, the evaluation criteria of these restorations are shown.

RESULTS

Table 4 shows average values of Probing Depth, Clinical Level of Insertion, Gingival Index, Bleeding caused by Probing and Plaque Index in both groups, with their corresponding polishing, for both time periods (0 and 30 days), respectively. As regards G2, in all the periodontal evaluation criteria applied in maintenance therapies, there were statistically significant differences ($p<0,05$) between the initial and the final period, with a relative improvement of the parameters under analysis. As regards G1, there were statistically significant differences ($p<0,05$) between the initial and the final period. There was an exception in the Gingival Index criterion, in which there was no evidence of statistical difference ($p>0,05$) among the groups.

Table 5 shows the percentage averages of Marginal Adaptation, Anatomical Shape, Marginal Discoloration, Caries Formation, Post-op Sensitivity and Retention in both groups, with their polishing, at days 0, 30 and 90, respectively. As regards G1 and G2, in which polishing procedures (Soft-Lex, FlexiCups & PoGo) were carried out in non-carious cervical lesions, Marginal Adaptation, Anatomical Shape and Marginal Discoloration criteria, obtained both by the Fisher Exact Test, as well as by the Qui-Square Test, did not throw statistically significant differences ($p>0,05$) in the initial period for the 30-day and 90-day periods.

Once again, as regards G1 and G2, in which polishing procedures (Soft-Lex, FlexiCups & PoGo) were carried out in non-carious cervical injuries, criteria of Caries Formation, Post-op Sensitivity and Retention, obtained both by Fisher Exact Test and by Qui-Square Test, did not throw statistical differences ($p>0,05$) in the initial period for the 30-day and 90-day periods.

Table 3: USPHS Evaluation Criteria for direct clinical evaluation of restorations.

Category	Evaluation Scale		Criterion
	Acceptable	Unacceptable	
Marginal Adaptation	A		Undetected via exploration
	B		Detectable fissure (exploring probe is on on both ways)
		C	Obvious fissure or fracture
Anatomical Shape	A		Undetectable fissure
	B		Detectable fissure only in enamel
		C	Detectable fissure around enamel-dentine
Marginal Discoloration	A		Without Discoloration
	B		Surface Stain (removable, usually localized)
		C	Deep Stain
Caries Formation	A		Without evidence of caries
		B	Evidence of caries
Post-op sensitivity	A		Absence of post-op sensitivity
		B	Experience of post-op sensitivity at some point of the restoration process or during the study period
Retention	A		Retained
	B		Partially Retained
		C	Loss of Restoration

DISCUSSION

Restorations of composite resin next to periodontal tissues may be a factor of bacterial plaque build-dup (dental biofilm), the main cause of periodontal conditions[7]. Notwithstanding, in this study our aim is to explain biocompatibility of composite resin with nanoparticles in diabetes mellitus patients, with three different types of polishing procedures.

Periodontal condition, an infection producing a strong inflammatory reaction[8], is more prevalent and severe in diabetic patients than in patients with a normal tolerance to glucose and, according to Kawamura [9], the periodontal condition is the most relevant oral complica-

Table 4: Average ± standard deviation of Probing Depth, Clinical Level of Insertion, Gingival Index, Bleeding on Probing and Plaque Index in maintenance therapies in 0-30 day period.

	Groups	Periods	Polishing		
			Flexi Cups	***PoGo***	***Soft-Lex***
Probing Depth (mm)	Diabetic	Initial 1 month	1.963 ± 0.5 A 1.946 ± 0.50B	1.762 ± 0.50E 1.745 ± 0.50F	1.847 ± 0.43H 1.884 ± 0.40I
	Non-Diabetic	Initial 1 month	2.248 ± 0.78C 2.135 ± 0.78D	1.881 ± 0.30G 1.840 ± 0.24H	2.331 ± 0.43J 2.582 ± 0.41K
	Groups	**Periods**	**Polishing**		
			Flexi Cups	***PoGo***	***Soft-Lex***
Clinical Level of Insertion (mm)	Diabetic	Initial 1 month	2.398 ± 0.32A 2.450 ± 0.70B	2.497 ± 0.68D 2.523 ± 0.70E	2.797 ± 1.09H 2.814 ± 1.05I
	Non-Diabetic	Initial 1 month	2.398 ± 1.11A 2.421 ± 1.01C	1.565 ± 0.76F 1.750 ± 0.80G	1.532 ± 0.50J 1.762 ± 0.42G
	Groups	**Periods**	**Polishing**		
			Flexi Cups	***PoGo***	***Soft-Lex***
Gingival Index (%)	Diabetic	Initial 1 month	0 ± 0A 0 ± 0A	1.66 ± 0.05B 0 ± 0A	1.66 ± 0.05B 0 ± 0A
	Non-Diabetic	Initial 1 month	0 ± 0A 0 ± 0A	0 ± 0A 0 ± 0A	3.33 ± 0.06C 1.66 ± 0.05B
	Groups	**Periods**	**Polishing**		
			Flexi Cups	***PoGo***	***Soft-Lex***
Bleeding on Probing (%)	Diabetic	Initial 1 month	6.66 ± 0.16A 5 ± 0.15B	9.97 ± 0.11E 6.64 ± 0.80A	11.65 ± 0.15F 6.66 ± 0.11A
	Non-Diabetic	Initial 1 month	1.66 ± 0.05C 0 ± 0D	11.64 ± 0.13F 6.66 ± 0.80A	13.30 ± 0.15G 8.33 ± 0.14H
	Groups	**Periods**	**Polishing**		
			Flexi Cups	**PoGo**	**Soft-Lex**
Plaque Index (%)	Diabetic	Initial 1 month	20 ± 0.32A 23.3 ± 0.31B	40 ± 0.41E 31.66 ± 0.38F	29.92 ± 0.23G 23.3 ± 0.21B
	Non-Diabetic	Initial 1 month	4.99 ± 0.11C 3.33 ± 0.10D	3.32 ± 0.06D 5 ± 0.11C	34.99 ± 0.18H 23.3 ± 0.23B

*p<0.05 Different letters means Statistically Significant

tion among these patients, being considered the sixth classical complication in diabetic patients.

Oral hygiene instructions are a key factor in any treatment plan for diabetic or non-diabetic patients with periodontal condition, and form part of treatment follow-up programs. Hence, in periodontal patients, adequate plaque controls are essential for the success of treatment and for the prevention of recurrence[9]. With an inadequate control of diabetes, patients have significantly higher levels of gingival bleeding and gingivitis than patients with a moderate-to-good control. Additionally, they also show more bleeding and gingivitis than patients not ridden by such condition. There is no significant difference between the microbiota of diabetic and non-diabetic subjects. This suggests that the higher prevalence, extension and severity of destructive periodontal conditions in such subjects may be ascribed to alterations in the immune response of hosts[10].

After 30 days, clinical variations were detected, in Depth of Probing, Clinical Level of Insertion, Plaque Index, Gingival Index and Bleeding during Probing between G1 and G2. These groups received the same basic periodontal, restoring and polishing therapy, with statistically significant differences ($p<0,05$), as shown in Table 4, even though they did not show extremely significant clinical evidence and it was observed that restorations with resin composite with nanoparticles were not a clinically aggressive factor on the periodontal tissue in both groups, as there was no significant clinical alteration in any of the parameters which could account for aggressions caused by the resin. This may be an evidence of clinical biocompatibility of such composite resin in diabetes mellitus carriers, irrespective of the type of polishing and throughout a short time period.

Biocompatibility of restoration materials has been the subject of many studies. Even though the amalgam shows a lower accumulation of microorganisms than in composite resins, it was not included in this study due to is unsightly aesthetic feature, lower fiberblast adhesion and lower bone biocompatibility, compared to resinous materials[11].

Restorations next to gingival tissues, having an over contour and, specially, those not achieving optimal polish and smoothness levels, may increase the presence and bacterial plaque buildup in the oral cavity and, consequently, may bring about periodontitis, which, in turn, may exacerbate hyperlpidemia-induced diabetes, alterations in immune cells and a decrease in the repair capacity of tissues[2].

Studies have proved that restoration of non-carious cervical injuries may protect the affected area from sensitivity and from the future loss of dental structure[12,13], apart from being an easy and relatively simple technique, when compared to other aesthetic treatments. Additionally, the texture obtained from restoration after finishing and polishing fosters low adhesion levels of the dental biofilm and minimal inflammation of soft tissues[13,14]. Costa [15] observed that polishing supplies periodontal tissues with more tolerance to restorations and, according to Chunget et al., [16] , such procedures decrease roughness of surfaces (between 26 and 74%). Kawai e Urano [17], mentioned the importance of a smooth surface to prevent bacterial plaque buildup, and its influence on periodontal health in patients, even those who follow good oral sanitation practices.

Several factors may determine the characteristics of the surfaces of composite resin restorations after finishing and polishing. This includes the features of restoration materials such as shape, hardness and size of load particles and factors related to the abrasive systems of polishing materials, such as, flexibility of the material in contact which the abrasive material, hardness, geometry, and application speed[18,6]. Results obtained from this study showed that, even after 90 days, restorations of composite resin with nanoparticles, in non-carious cervical lesions in Diabetic and Non-Diabetic subjects had features similar to those found in the initial stages, as Table 5 shows, in which

Table 5: Percentage averages (%) of Marginal Adaptation, Anatomical Shape, Marginal Discoloration, Caries Formation, Post-op sensitivity and Retention of Restorations in groups of Diabetic and Non-Diabetic participants in their corresponding polishing procedures and periods.

Criteria		Soft-Lex						Flexi Cups						PoGo					
		Diabetic			Non-Diabetic			Diabetic			Non-Diabetic			Diabetic			Non-Diabetic		
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Marginal Adaptation	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0
	1	90	10	0	100	0	0	100	0	0	100	0	0	100	0	0	90	10	0
	3	90	10	0	100	0	0	90	10	0	100	0	0	100	0	0	90	10	0
Anatomical Shape	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0
	1	90	10	0	100	0	0	80	20	0	100	0	0	100	0	0	100	0	0
	3	90	10	0	100	0	0	80	10	10	100	0	0	100	0	0	100	0	0
Marginal Discoloration	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0
	1	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0
	3	90	10	0	100	0	0	80	20	0	100	0	0	100	0	0	100	0	0
Caries Formation	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0
	1	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0
	3	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0
Post-op sensitivity	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0
	1	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0
	3	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0
Retention	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0
	1	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0
	3	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0
Reason for Restorations	0 1 3	100 (10/10)			100 (10/10)			100 (10/10)			100 (10/10)			100 (10/10)			100 (10/10)		

* Non-significant statistical data within the same group with p>0,05

Caries-Formation, Post-op Sensitivity and Retention criteria did not show clinical variances between the initial and the final stages. On the other hand, there was evidence of clinical variances only in terms of Marginal Adaptation, Anatomic Shape and Marginal Discoloration, although from a statistical perspective they did not show significant differences (p>0,05) in these clinical parameters, thus benefiting both groups in the dental biofilm control.

According to Silva et al. [19], many of the authors agree on the fact that aluminum oxide discs, for example, Soft Lex (3M ESPE) and FlexiCups (Cosmedent), may produce surfaces with low levels of roughness due to the fact that the abrasive particles in these discs promote an abrasion equal to that of load particles and of resinous matrix. Notwithstanding, according to some statements, their shape makes access to some tooth areas difficult and they requires higher clinical timing as they are applied in an abrasiveness sequence, by which different steps must be followed to attain a clinically acceptable surface.

More recent studies, such as those of Paravinaet al.[20] and St-Georges et al.[21] assessed a new single-step polishing system, the PoGo system. Results were better or equal to those shown with aluminum oxide discs. In another research[22], the PoGo system produced a clinically acceptable surface for different types of resin. Hence, such system proved to be effective and capable of delivering better clinical timing.

In this research, both G1 and G2 received three types of polishing procedures: Soft Lex Discs (3M ESPE), FlexiCups Abrasive Points (Cosmedent), Abrasive Rubber PoGo (Dentsply), and, according to the results when different indicators were observed, such as Marginal Adaptation, Anatomic Shape and Marginal Discoloration, although all three polishing procedures showed clinical differences between the initial and the final period (90 days), none of them outstepped the others from the statistic perspective in these clinical parameters (p>0,05). This result can be ascribed to the feature of the restored material, as the composite resin with nanoparticles used in this research had load particles that promoted greater surface smoothness and thus was a polish-enhancer in all the techniques that were used[23]. Notwithstanding, in order to confirm the results of this research, additional studies may be undertaken to increase the number and the period of evaluations, as well as to increase the number of restorations to be carried out.

Within the scope of this research and based on the clinical significance of results, we may suggest that in a brief period (90 days) there is clinical biocompatibility of restorations of composite resin with nanoparticles in non-carious cervical lesions and in periodontal tissues of Diabetes Mellitus patients, irrespective of the type of polishing procedure of such restorations.

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