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OBSERVATIONAL STUDY ABOUT EFFECTS OF PERIODONTAL SURGICAL THERAPY ON BLOOD PRESSURE

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ABSTRACT:

AIM: The aim of the study is verified if, in periodontal patients who need surgical treatment, surgery is or is not able to change pressure profile, both in normotensive and in hypertensive persons, even if they are in pharmacological treatment.

MATERIAL AND METHODS: 60 patients were monitoring, all with periodontal disease, 30 of them did not suffer from arterial hypertension and 30 were hypertensive. All patients needed a periodontal surgical treatment.
The protocol used for this studio is:

- Anamnesis, detection of blood pressure and anthropometric parameters at time 0;
- Detection of periodontal indices;
- Causal therapy and detection of blood pressure at the end of the cycle;
- Periodontal surgery;
- Detection of blood pressure after 4 months;\
- Revaluation and detection of blood pressure after 8 months.

RESULTS: Hypertensive patients with generalized or localized aggressive periodontitis, showed an improvement of blood pressure levels, especially the systolic pressure that lowered by 10/20 mmHg at 4 months; this value has been also maintained at 8 months. Normotensive patients with aggressive periodontitis didn't showed important modification during pressure controls.
Hypertensive patients with chronic periodontitis, showed an improvement of blood pressure by 10/20 mmHg, but for 14 patients, after review of 8 months, 6 of them had the same blood values they had before periodontal surgical treatment. Normotensive patients with chronic periodontitis didn't showed modification during pressure controls.

CONCLUSION:
We can affirm that periodontal surgery, performed after a casual therapy, improves the blood pressure in hypertensive patients, especially in patients with aggressive periodontitis. This data must be considered with caution because this observational studio has limited sample and follow up time.

INTRODUCTION

INFLAMMATION AND HYPERTENSION

Even if the inflammation is an essential component of immune response, it determines some mechanisms who can be harmful for the organism. One of these mechanisms is vascular inflammation because induces an increase of vascular permeability and an alteration of endothelial function. In the last few years, studies regarding correlation between inflammation and hypertension are increased. It was demonstrated that interaction between the inflammatory cells and the endothelial cells is increase in hypertensive patients (1;2) it was noticed, in decompensated hypertensive patients, an increase of reactive protein C and stiffness of vascular wall.

In normal condition the endothelial cells have vasodilatory, antithrombotic and anti-inflammatory functions. But pro-inflammatory conditions can promote an alteration of endothelial functions on regulation mechanisms that control blood pressure. The endothelial cells, in fact, have an important role on the regulation of blood pressure through synthesis of vasodilators like Nitric Oxide, Angiotensin II, Prostaglandin PGI2 and vasoconstrictors.

HYPERTENSION AND PERIODONTITIS: SCIENTIFIC EVIDENCE

Many studies had put in evidence the correlation between hypertension and periodontitis (3;4) and observed that a worsening of periodontal health can be associated to a worsening of blood pressure. It was also documented that hypertensive subjects have, very often, a worsening of the conditions of periodontal health. Even if the demonstrate results seem very similar, these studies are different for the number and typology of the sample that they used and, also, for how these studies was conducted. For this reason the obtained data must to be considered with caution.

There are different explanations about the correlation between periodontitis and hypertension:

- Inflammation. For many studies the inflammatory response, together with periodontitis, is considered an adverse effect in blood pressure regulation. Periodontal disease, in fact, can induced vascular inflammation and can produce an endothelial dysfunction (5;6).
- Oral infection. The bacterial biofilm is a necessary condition in periodontitis, especially when it is made up from Gram negative species like P. Gingivalis, Prevotella Intermedia, A. Actinomicetemcomitans etc. It was demonstrated that P. Gingivalis determines the activation of the endothelial cells involved in the pathogenesis of hypertension (7).
- Oxidative stress. In inflammatory conditions like periodontitis the production of reactive oxygen species increase not only locally but also systemically (8;9). The oxidative stress is one of the involved factors in development of hypertension. (10;11).
- Endothelial dysfunction. It was demonstrated that periodontal disease can contribute on a endothelial dysfunction who can increase the risk of hypertension (12). Also, severe condition of periodontal inflammation can be associated to a significant endothelial dysfunction that it is reversible after therapy (13;14;15).

AIM OF THE STUDY:

The aim of the study is verified if, in periodontal patients who need surgical treatment, surgery is or is not able to change pressure

profile, both in normotensive and in hypertensive persons, even if they are in pharmacological treatment.

MATERIAL AND METHODS:

60 patients were monitoring, 32 females and 28 men all with periodontal disease, 30 of them did not suffer from arterial hypertension and 30 were hypertensive. The hypertensive patients were in antihypertensive therapy, everyone with different drugs. 17 of these patients were affected from localized aggressive periodontitis, 13 from generalized aggressive periodontitis and 30 from chronic periodontitis.

Also 16 patients with the aggressive periodontitis were in treatment with antihypertensives, 14 no. Of the patients with chronic periodontitis only 14 were in pharmacological treatment for hypertension.

All patients needed a periodontal surgical treatment.
The protocol used for this studio is:

- Anamnesis, detection of blood pressure and anthropometric parameters at time 0;
- Detection of periodontal indices;
- Causal therapy and detection of blood pressure at the end of the cycle;
- Periodontal surgery;
- Detection of blood pressure after 4 months;
- Revaluation and detection of blood pressure after 8 months.

The measurement of blood pressure was detected according to the guidelines of the American Heart Associations:

- The measurement was carried out in calm ambient and the patient was in seated position with his feet flat on the floor, his back straight and supported and his arm flexed
- Before auscultation measurement it was carried out **the palpation measurement**
- The cuff it was placed at the height of the heart
- The stethoscope was placed over the brachial artery
- The cuff it was inflated 30 mmHg over the systolic pressure
- Systolic pressure was determined at the first knocking sound (Phase I of Korotkoff)
- Diastolic pressure was determined at the last knocking sound (Phase V of Korotkoff)
- After the last knocking sounds the cuff is deflated at a moderate rate **of 2-3 mmHg** / sec
- It was taken 3 readings, separated by at least 1 minute, and it was recorded all the results.

Epidemiological studies on hypertension can present considerable difficulties because the values of blood pressure are not constant but they can change in relation to many factors:

1. Physical and Psychological conditions
2. Times of the blood pressure detection
3. Size of the cuff
4. Column mercury broken or not completely straight
5. Cuff it not placed at the height of the heart
6. "Non-basal" conditions of the patient (if patient has smoked, exercise, drink caffeinated beverages or alcoholic).

RESULTS:

From the measurements made to date, on the selected sample, we could observe that:

Hypertensive patients with generalized or localized aggressive periodontitis, showed an improvement of blood pressure levels, especially the systolic pressure that lowered by 10/20 mmHg at 4 months; this value has been also maintained at 8 months. Normotensive patients with aggressive periodontitis didn't showed important modification during pressure controls.

Hypertensive patients with chronic periodontitis, showed an improvement of blood pressure by 10/20 mmHg, but for 14 patients, after review of 8 months, 6 of them had the same blood values they had before periodontal surgical treatment. Normotensive patients with chronic periodontitis didn't showed modification during pressure controls.

On these tables there are the results made to date, divided by aggressive and chronic periodontitis with the registered pressure values.

PATIENTS WITH AGGRESSIVE PERIODONTITIS

Paziente	Tempo 0	Post- intervento	4 mesi	8 mesi
1. iper aggr	150/ 80	140/70	140/70	140/70
2. iper aggr	160/85	145/75	145/75	145/75
3. iper aggr	160/75	140/70	140/70	140/70
4. iper aggr	170/ 80	160/70	150/ 80	135/70
5. iper aggr	140/80	135/70	140/70	135/70
6. iper aggr	155/ 80	140/70	140/70	140/70
7. iper aggr	150/ 80	140/70	140/70	140/70
8. iper aggr	160/80	145/70	145/70	145/70
9. iper aggr	160/70	140/70	140/70	140/70
10. iper aggr	175/ 80	165/70	155/ 80	140/70
11. iper aggr	145/80	135/70	140/70	135/70
12. iper aggr	150/ 80	140/70	140/70	140/70
13. iper aggr	155/ 80	145/70	145/70	140/70
14. iper aggr	160/85	145/75	145/75	145/75
15. iper aggr	160/75	140/70	140/70	140/70
16. nor aggr	125/ 80	120/80	150/ 80	135/70
17. nor aggr	130/70	125/70	130/70	130/70
18. nor aggr	135/70	130/70	130/70	130/70
19. nor aggr	120/65	125/70	125/70	125/70
20.nor aggr	125/70	120/65	125/70	125/70
21. nor aggr	130/70	125/70	130/70	130/70
22. nor aggr	130/75	125/75	130/70	130/70
23. nor aggr	120/65	125/70	125/70	125/70
24.nor aggr	125/70	120/65	125/70	125/70
25. nor aggr	130/70	125/70	130/70	130/70
26. nor aggr	130/70	125/70	130/70	130/70
27. nor aggr	120/65	125/70	125/70	125/70
28. nor aggr	125/70	120/65	125/70	125/70
29. nor aggr	130/70	125/70	130/70	130/70
30. nor aggr	130/70	125/70	130/70	130/70

PATIENTS WITH CHRONIC PERIODONTITIS

1.cro.iper	150/ 80	140/70	145/70	150/80
2.cro.iper	150/ 80	140/70	140/75	150/80
3.cro.iper	160/80	145/75	145/75	160/75
4.cro.iper	150/ 80	140/70	145/70	150/80
5.cro.iper	150/ 80	140/70	140/70	150/80
6.cro.iper	150/ 80	140/70	145/75	150/80
7.cro.iper	160/80	145/75	145/75	140/75
8.cro.iper	150/ 80	140/70	140/70	140/70
9.cro.iper	150/ 80	140/70	140/70	140/70
10.cro.iper	150/ 80	140/70	140/70	130/70
11.cro.iper	160/80	145/75	145/75	135/75
12.cro.iper	150/ 80	140/70	140/70	140/70
13.cro.iper	155/ 80	140/70	140/70	140/70
14.cro.iper	150/ 80	140/70	145/70	140/70
15.cro.nor	110/60	115/60	100/60	105/60
16.cro.nor	130/70	125/70	130/70	130/70
17.cro.nor	125/65	120/70	120/70	125/70
18.cro.nor	120/60	105/60	100/60	105/60
19.cro.nor	120/60	110/60	110/60	115/60
20.cro.nor	120/80	115/80	115/80	115/70
21.cro.nor	130/70	125/70	130/70	120/70
22.cro.nor	125/65	120/70	120/70	125/70
23.cro.nor	115/70	110/60	110/60	110/60
24.cro.nor	110/60	110/60	100/60	105/60
25.cro.nor	120/70	115/60	110/60	110/60

26.cro.nor	130/70	125/70	130/70	120/70
27.cro.nor	125/65	120/70	120/70	125/70
28.cro.nor	120/75	115/70	110/60	110/60
29.cro.nor	120/80	115/75	120/70	120/70
30.cro.nor	120/75	125/70	125/70	125/70

CONCLUSION:

The data obtained from the study, based on the literature review, suggest a correlation between periodontitis and hypertension, in particular, we can affirm that periodontal surgery, performed after a casual therapy, improves the blood pressure in hypertensive patients, especially in patients with aggressive periodontitis. This data must be considered with caution because this observational studio has limited sample and follow up time. So, it is necessary other investigations.

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