Evaluation of the Clinical and Immunological Parameters During Treatment Chronic Periodontitis by Camelyn Mouthwash

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Abstract

The purpose of study is Evaluation of Clinical and Immunological effects of using Camelyn in Periodontology. **Materials and methods:** We have studied clinical and immunological features of 20 patients with periodontitis between ages 20 and 60 (these patients were **from the dental clinic** *Mitra*). CPI index has been studied dynamically — before treatment, after treatment, 6 months and 1 year later. Treatment included scaling and root planning. During these 2 weeks we have used 10 ml of Camelyn 25 percent solution for rinsing. We applied it for 2 minutes. We checked cellular and humoral immunity in peripheral blood stem. Lysozyme activation was determined. **Results:** After treatment, the median CPI index was significantly reduced. After 6 months and a year of treatment it was insignificantly increased, but in comparison with the initial CPI it was remained significantly less.Before starting treatment Interferon and the phagocytic system was significantly lowered, also amount of T-Lymphocytes, but the amount of T suppressors was increased; After the treatment mentioned above the parameters were significantly increased, although in comparison with the standard it still was low. After the treatment the amount of T- suppressors was significantly decreased.Saliva significantly showed a reduction of the amount of lysozyme and sIgA Before treatment IgG was significantly lower and IgM higher. After the treatment all kinds of Immunoglobulins were almost the same; **Conclusion:** Including Camelyn in

traditional treatment of periodontitis promotes immune response activation and it has a positive influence on a clinical picture —it improves periodontitis clinical features and significantly reduces CPI index.

Keywords: Periodontitis, Camelyn, cellular and humoral immunity, phagocytosis, lysozyme

Introduction

One of the most difficult issues in stomatology is the treatment of tissues damaged by periodontitis. This is one of the most common pathologies in the world. It has been proven that gingivitis and periodontitis are caused by immune reactions to reactions to bacterial biofilms under the gums.

Today in the study of the oral cavity there have been found about 20 species of bacteria which are counted as periodontal pathogens. According to the advanced research methods the number of these pathogens has been increasing. In order to cause disease these pathogens need to multiply under the gums tissue and release substances which directly affect or go through immune system activation that can damage periodontal tissue [Gogilashvili K.,2016] Deep pathological processes cause destructive processes in periodontal tissue. Chronic inflammatory oral cavity tissue causes sensibilization and in time suppresses the patient's immune system. Because of all of these factors it is very important to develop immunotherapy for this pathology.

Changes in the immune system parameters are the turning point in developing periodontal inflammatory and the indicator's dynamics depends on severity of disease [Javed A.K. et al 2011].

Patients with chronic and aggressive periodontitis have increased number of cytotoxic cells or T-lymphocytes which causes periodontal tissue damage[Cifcibasi E. et al., 2014]. Here is shown the decrease of ratio between T helpers and suppressors and increase of the number of B cells [Sigusch B. et al. 2006].

In recent times Camelyn has been used for inflammatory disease treatment. This medicine has anti-inflammatory, painkilling and regeneration stimulating effects. Camelyn regulates local immune system reactions and strengthens barrier function; it also has antibacterial and antifungal effects [Kachkachuishvili I.,2010]. We have studied Camelyn's immunomodulating effect in treating periodontitis and we have had positive results without side effects [[Kachkachuishvili I.,2010].

The purpose of study is Evaluation of Clinical and Immunological effects of using Camelyn in Periodontology.

Materials and methods: We have studied clinical and immunological features of 20 patients with periodontitis between ages 20 and 60 (these patients were **from the dental clinic** *Mitra*). CPI index has been studied dynamically — before treatment, 1 month, 6 months and 1 year later. Treatment included scaling and root planning. During these 2 weeks we have used 10 ml of Camelyn 25 percent solution for rinsing. We applied it for 2 minutes. We checked cellular and humoral immunity in peripheral blood stem. By indirect immunofluorescence, using cytometers, monoclonal antibodies and their superficial antibodies — CD3 (total number of T lymphocytes), CD4 (T-helper phenotype), CD8 (T-supressive phenotype) and CD19 (B-lymphocytes total number), we have checked the amount of lymphocytes and their subpopulations.Testing of tree types of immunoglobulins (IgM, IgG and IgA) was performed using radial immunodiffusion method according to G.Mancini et al. Interferon production in vitro by leukocytes was evaluated by the method of V.D. Solovyov and T.A. Bektemyrov. In order to evaluate phagocytosis it has been checked and there have been three results: phagocytic number (PhN) - number of phagocytic cells by neutrophils (in 100 cells), index (PhI) - Average number of microbes per neutrophil (S. aureus, inactivated standard strain N209) and the end of phagocytosis (PhD) - percent of digested microbes from total number. Lysozyme activation was determined by the Nephelometric method; this measurement is done by measuring the scattered light that has passed through a sample (mixture of microbes) at an angle (Алексеев, В. В. ,2013)..

The comparison between groups was made by the criteria of a Student — before and after treatment by the Student **Paired Samples Test**, between Experimental Group and Standard, — the by student The One-Sample Test. Mathematical Provision was accomplished by using Statistical program SPSS 22.

Results: Using of Camelyn has improved clinical results, namely, after 2-3 procedures objected clinical examination and showed significant improvements — inflammation was reduced, edema and hyperemia were eliminated and bleeding from gums was reduced. The areolar tissue of the gums of the patients became denser, pain disappeared and life quality of the patients was improved. For evaluation of clinical features we have used CPI index which we have examined before treatment, after treatment, after 6 months of treatment and after 1 year of treatment (diagram №1, chart №1).

After treatment, the median CPI index was significantly reduced. After 6 months and a year of treatment it was insignificantly increased, but in comparison with the initial CPI it was remained significantly less. `

Diagram №1

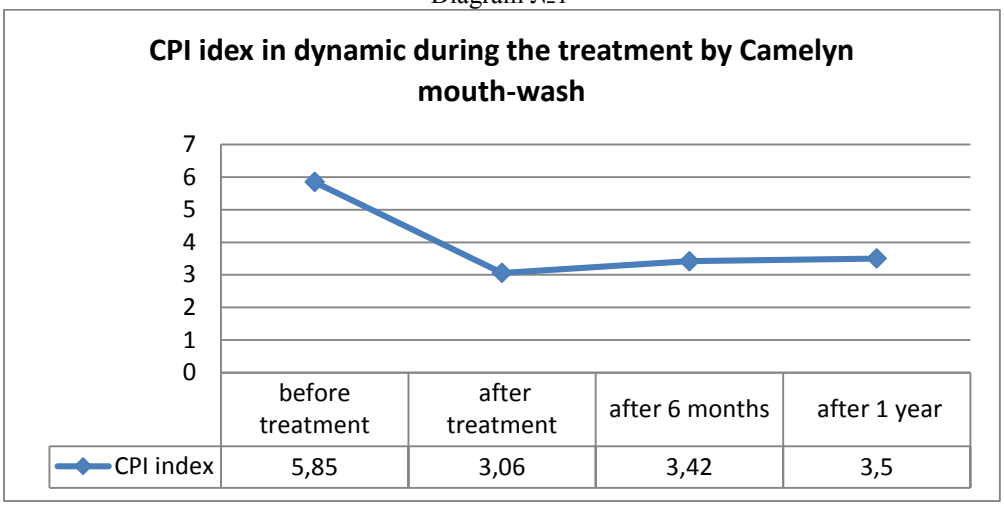


Chart №1

Statistic Evaluation of CPI index

CPI index	t	p
Before treatment-after treatment	7.35	0.000
Before treatment-after 6 month	5.75	0.000
Before treatment-after 1 year	5.99	0.000
after treatment -6 month after	-2.012	0.059
6 month after-1 year after	-0.36	0.723

We have learnt immunity indicators 1 month after starting periodontitis treatment (Chart №2, Diagram №2)

Chart №2

Immunity Indicators during the Treatment of periodontitis by Camelyn Mouth-wash

	Before treatment		After treatment		standard	Before treatment, standard		After treatment, standard		Before treatment, after treatment	
	Mean	Std.	Mean	Std.		t	p	t	p	t	p
αIF (U/ml)	25.80	7.620	30.40	7.155	41.3	-9.10	0.000	-6.81	0.000	-2.36	0.029
gIF (U/ml)	15.40	5.548	19.20	5.890	28.6	-10.64	0.000	-7.13	0.000	-3.44	0.003
Tcom(CD3)	49.20	2.042	50.60	1.667	51.5	-5.04	0.000	-2.41	0.026	-3.24	0.004
Tact(CD2)	22.0	2.11	24.8	1.81	28.5	-	0.00	-	0.00	-	0.00

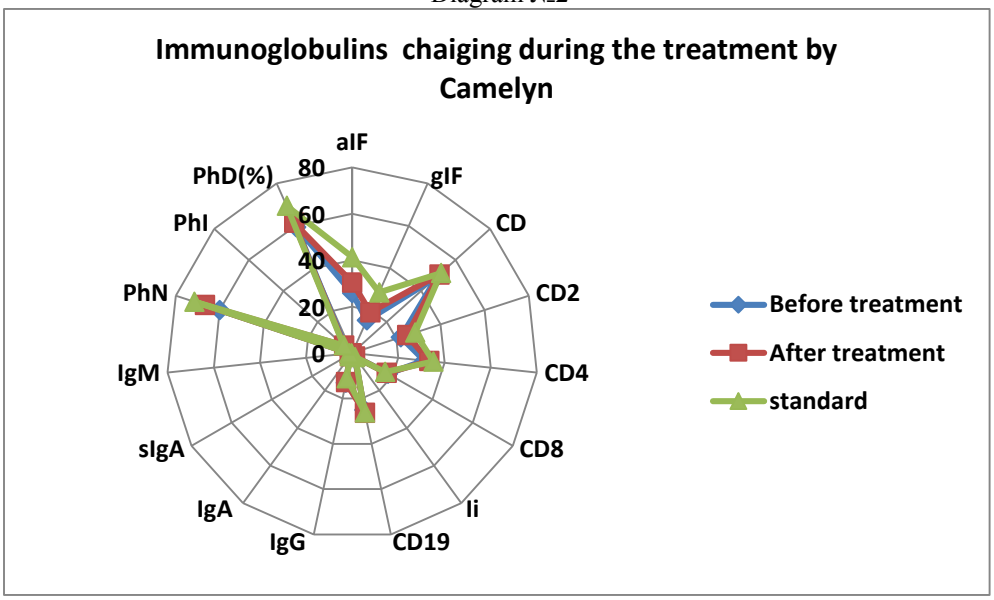
	5	4	5	4		13.64	0	9.00	0	4.96	0
Th(CD4)	31.30	2.577	33.35	2.183	35.2	-6.77	0.000	-3.79	0.001	-3.70	0.002
Ts(CD8)	17.85	0.875	17.15	0.933	16.3	7.92	0.000	4.07	0.001	2.90	0.009
Ii	1.79	0.205	1.96	0.220	2.16	-8.08	0.000	-4.12	0.001	-3.01	0.007
Bcom(CD19)	25.10	1.619	26.40	1.698	26.3	-3.31	0.004	0.26	0.795	-2.26	0.036
IgG (g/l)	13.13	1.234	12.89	1.656	11.2	6.98	0.000	4.55	0.000	0.45	0.660
IgA (g/l)	1.75	0.212	1.68	0.112	1.73	0.42	0.677	-2.20	0.040	1.46	0.160
sIgA(g/l)	0.37	0.343	0.35	0.222	0.28	1.23	0.236	1.36	0.190	0.31	0.763
IgM(g/l)	1.07	0.213	1.06	0.123	1.22	-3.15	0.005	-5.81	0.000	0.21	0.839
PhN (%)	60.00	6.609	66.75	4.711	71.6	-7.85	0.000	-4.60	0.000	-3.92	0.001
PhI	4.04	0.594	4.65	0.808	4.9	-6.47	0.000	-1.38	0.183	-2.39	0.027
PhD(%)	59.35	7.058	61.45	7.134	69.4	-6.37	0.000	-4.98	0.000	-0.69	0.496
Lys(%)	35.10	1.944	38.25	2.751	41.9	-15.64	0.000	-5.93	0.000	-3.93	0.001

Before starting treatment Interferon and the phagocytic system was significantly lowered; also amount of T- Lymphocytes and Th/Ts ratio was reduced, but the amount of suppressors was increased. Saliva significantly showed a reduction of the amount of lysozyme and sIgA. Such a dynamic shows that during periodontitis a body's immunocompetent system is suppressed and its intensity depends on the severity of the disease.

After the treatment mentioned above the parameters were significantly increased, although in comparison with the standard it still was low. After the treatment the amount of T- suppressors was significantly decreased. Before treatment IgG was significantly lower and IgM higher. After the treatment all kinds of Immunoglobulins were almost the same.

As the study has shown, during periodontitis endogenic Interferon is decreasing which causes cellular and humoral immunity to decrease. By suppressing the immune responses, phagocytoses decrease, and in turn, causes an inflammatory process (response) in gum tissue.

Diagram №2



Discussion

Periodontitis is a multifactorial disease. It is caused by a combination of several factors, such as: bacteria, environment and host's health conditions. Host's reaction includes adaptive immune system and inherited immune inclinations, which supports the development of chronic inflammation and peri-tooth tissue damage [Carvalho-Filho PC, 2016].

The function of T-cells during periodontitis is not fully clear [Ito H, 2005,]. According to some findings T-cells, CD4 and CD8 were not significantly different between the patient with periodontitis and control group. B-cells also were not increased [Carneiro VMA et al.2012]. Contrary to some findings, CD4+, CD25+ ,Tr cells and possibly other regulatory T-cell populations do exist and may play regulatory roles in periodontal diseases [Nakajima K. et al.,2005]. In our case, during periodontitis the amount of T-lymphocytes was comparably lower and Th/Ts ratios and Suppressors amounts were increased.

Some authors talk about the role of B-cells in periodontal homeostasis [Mahanonda R et al.,2016] and assume that purposeful influence on the immune index helps to cure periodontitis [Naiff PF et al., 2013]. According to our findings, during periodontitis before the

treatment there were insignificant increases of B-cellular immunity and after treatment we have had significant decreases of it.

In patients with chronic periodontitis IgG is increased [Carvalho-Filho et al.; 2016] and it was proved in our case also. Treating by Camelyn caused normalization of these readings. The amount of IgM was the same before and after the treatment.

According to the literature, during periodontitis peripheral neutrophils phagocytic activity is changing [Asif K, et al. 2010]. Phagocytic index is lowered and accordingly lowers the phagocytic neutrophils percentage [Carneiro VMA et al., 2012]. According to our study, before treating neutrophils the percentage, phagocytic numbers and the phagocytic index was lowered. After treating the phagocytic activation the phagocytic index was improved [Carneiro VM1 et al., 2012]. During the treatment by Camelyn it significantly was increased and all the readings of neutrophils phagocytic activities.

Lysozyme can be considered an important natural protector of elastic fibres in pathological gingiva [Younes R1. et al.,2009]. During gingivitis and periodontitis lysozymes activity in gum's fluids are significantly higher in comparison to healthy people's saliva, although its activity in non-stimulated the saliva is low [Surna A1, 2009]. According to our examination before treatment the amount of lysozymes in the mouth cavity and the saliva was significantly reduced. After treatment we had a significant increase of it.

Using immunological parameters can add important details to periodontitis clinical diagnostics [Papantonopoulos G. et al.,2013].

So, after using Camelyn mouth-wash we had clinical improvement and immunological readings that were much closer to the standard.

Conclusion

During periodontitis it is recommended to determine the immune status. This gives the opportunities to have a differential influence on a pathogenic chain.

Including Camelyn in traditional treatment of periodontitis promotes immune response activation and it has a positive influence on a clinical picture —it improves periodontitis clinical features and significantly reduces CPI index.

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