

Comparative Study on Meridol Solution Effect in Reducing Inflammatory Changes in the Gums

Komparativna studija o djelovanju meridol tekućine na smanjenje upalnih promjena gingive

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Summary

The aim of this study was to evaluate the effects of »Meridol« solution for mouth rinsing (containing SnF₂ and aminfluoride 297) on plaque and gingiva. The study was carried out in four groups of children. Group A rinsed their mouth once a week during six months, group B once a day for a month, while groups KA and KB served as control. The criterion for relevant plaque recording was OH index as modified by green and Vermillion. Periodontal status was obtained by applying the CPTIN index. The plaque reduction was significant in groups A and B. When the solution was applied, it was noted the reduction in bleeding sextants. Results showed »Meridol« solution to be recommendable together with proper oral hygiene in the prophylactic treatment of decay and gingivitis.

Key words: *mouth rinses, gingivitis, plaque*

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Introduction

The severity of tooth decay has been gradually decreased. However, inflammatory changes of the gingiva in children and periodontal changes in older children resulting from poor hygiene are ever more frequently encountered (1, 2). The plaque is a factor contributing to the onset and progression of decay and periodontal diseases. Therefore, prevention and removal of the existent plaque is of a paramount importance in the prophylactic treatment (3, 4, 5). In order to resolve this problem, many chemotherapeutic agents have been tested. Most suitable are those added to mouth rinse solutions. Stannous ions provide antibacterial effects by

acting on the protein surface of bacteria, thus blocking the passage of carbohydrates into the cells (6, 7).

Based the knowledge obtained so far about the effects of aminfluoride on bacterial adherence and the effect of stannous fluoride (SnF₂), these active substances are added to mouth rinse solutions. The »Meridol« solution used in this study contains active substances, such as aminfluoride 297 and stannous fluoride (SnF₂), dissolved in distilled water with dye and flavor added. These substances in »Meridol« inhibit the formation of plaque, neutralize the bacterial action in the already existent plaque and favor the resistance of oral mucosa.

The aim of this study was to clinically evaluate the effect of »Meridol« solution on plaque index and gingival tissue.

Methods and examinees

The criterion for unbiased plaque recording is determined by oral hygiene index (OHI) modified by Green and Vermillion. Data on periodontal findings are collected by applying the CPITN index with probes (WHO Recording Periodontal Probe) to assess gingival bleeding, detect calculus and determine the depth of periodontal pockets according to the latest WHO standards and methods.

The OHI data are statistically processed at the Zagreb University Computer Center, based on the Stuart's test of dependent samples. The study included four group of children of both sexes, aged 8–18 years. During the study period, no instructions were given as to oral hygiene procedures, in order to avoid any possible educational influence on the results.

Group A consisted of 67 children who rinsed their mouth with 100 ml of »Meridol« solution once a week for six months. In group A, OHI and CPITN indices were determined at the beginning of the study and six months later. Group B (31 child) rinsed their mouth once a day during one month. Plaque index and periodontal status were evaluated before and after the »Meridol« treatment. Groups KA (58 children) and KB (29 children) were control groups. In group KA, the above listed parameters were determined at the beginning of the study and six months later, and in group KB at the beginning of the study and one month later.

Results

In group A, grade III of oral hygiene was found in 47.7% children (OHI ranging between 3.1 and 6.0) before the »Meridol« treatment; grade II of oral hygiene was present in 40.4% (OHI ranging between 1.6 and 3.0), whereas grade I was found in 11.9% children (OHI ranging between 0 and 1.5).

After the six-month treatment with »Meridol« solution, the best results were achieved in the children who had the poorest oral hygiene status (grade III). Their percentage was reduced

Table 1. OHI index – group A

Tablica 1. OHI indeksi – grupa A

Grade Check-up	I (0–1.5)	II (1.6–3.0)	III (3.1–6.0)
I	11.9%	40.4%	47.7%
II	14.9%	56.7%	28.3%
Difference	3.0%	16.3%	19.4%

Table 2. OHI index – group KA

Tablica 2. OHI indeksi – grupa KA

Grade Check-up	I (0–1.5)	II (1.6–3.0)	III (3.1–6.0)
I	0%	46.5%	53.4%
II	6.8%	37.9%	55.1%
Difference	6.8%	8.6%	1.7%

from 47.7% to 28.3%, i.e. by 19.4%. In the group with grade II oral hygiene, this percentage increased from 40.4% to 56.7% (16.7%). Very similar results were obtained in the group with grade I oral hygiene, where an increase from 11.95 to 14.9% (3%) was observed.

At the beginning of the study, control group KA, who received no treatment, had grade III oral hygiene index in 53.4% of the children and grade II in 46.6% of the children. No subject was free of plaque. The oral hygiene status was reexamined six months later, revealing grade III oral hygiene to have risen from 53.4% to 55.1% (1.7%). Grade II was found in 37.9% children, i.e. a 8.6% improvement in comparison with the previous examination. 6.8% children had grade I, i.e. 6.8% of them more than in the first checkup.

Table 3. OHI index – group B

Tablica 3. OHI indeksi – grupa B

Grade Check-up	I (0–1.5)	II (1.6–3.0)	III (3.1–6.0)
I	0%	6.4%	93.5%
II	9.6%	38.7%	51.6%
Difference	9.6%	32.3%	41.9%

Group B had 93.5% children with grade III before the treatment, while only 6.4% of the children had grade II. None was found to have grade I. After a month of daily rinsing with »Meridol« solution 51.6% of the subjects showed grade III (a 41.9% increase in comparison with previous findings). Grade II increased from 6.4% to 38.7% (32.3%). Grade I was present in 9.6% children.

Table 4. OHI index – group K_B Tablica 4. OHI indeks – grupa K_B

Grade Check-up	I(0-1.5)	II(1.6-3.0)	III(3.1-6.0)
I	0%	51.7%	48.2%
II	3.4%	44.8%	51.7%
Difference	3.4%	6.9%	3.5%

Control group KB had the following pre-treatment results: grade III was present in 48.2% and grade II in 51.7% of the children; no child had grade I. After one month grade III increased by 3.5%, i.e. from 48.2% to 51.7%; grade II decreased by 6.9%, i.e. from 51.7% to 44.8% and 3.4% of the children had grade I of oral hygiene.

Statistical data processing showed that improved results on the oral hygiene index after »Meridol« treatment were statistically significant in both study groups. It should be mentioned that the control groups did not show any

Table 5. Results of statistical data – group A and group B

Tablica 5. Rezultati statističkih podataka – grupe A i grupe B

Group A

Grupa A

Check-up after six months			
	0-1.5	1.6-3.0	3.1-6.0
0-1.5%	3	4	0
1.6-3.0	4	19	1
3.1-6.0	4	20	12

$\chi^2 = 21.17$ $df = 2$ $P < 0.01$
 $N = 67$

Group B

Grupa B

Check-up after one month			
	0-1.5	1.6-3.0	3.1-6.0
0-1.5%	3	0	0
1.6-3.0	2	1	0
3.1-6.0	2	14	12

$\chi^2 = 17.07$ $df = 2$ $P < 0.01$
 $N = 31$

Table 6. CPITN index – group A

Tablica 6. CPITN indeks – grupa A

Sextant Check-up		0	1	2	3
I		52.5%	12.9%	17.2%	17.4%
II		57.7%	6.8%	17.9%	17.4%
Difference		5.2%	6.1%	0.7%	0 %

0 – healthy
 1 – bleeding
 2 – calculus
 3 – pockets

0 – zdravi
 1 – krvarenje
 2 – kamenac
 3 – džepovi

significant difference in the oral hygiene index between the pre and post-treatment examinations.

The periodontal tissue condition was evaluated on the basis of CPITN index. Group A had the following results at the beginning of the study: out of 402 sextants examined, 52.5% were healthy, in 12.9% bleeding was present, 17.2%

Table 7. CPITN index – group K_A Tablica 7. CPITN indeks – grupa K_A

Sextant Check-up		0	1	2	3
I		50.9%	21.6%	16.4%	11.2%
II		52.6%	19.8%	15.8%	11.8%
Difference		1.7%	1.8%	0.6%	0.6%

0 – healthy
 1 – bleeding
 2 – calculus
 3 – pockets

0 – zdravi
 1 – krvarenje
 2 – kamenac
 3 – džepovi

had calculus and 17.4% had pockets. After 6 months of rinsing with »Meridol«, the number of healthy sextants increased from 52.5% to 57.7% (5.2%); 6.8% sextants were bleeding, i.e. 6.1% of them less than on previous examination. Calculus were present in 17.9% of the sextants (a 0.7% reduction), while the percentage of sextants with pockets remained unchanged, i.e. 17.9%.

In group KA, 348 sextants were examined. At the beginning of the study, 50.9% of them were healthy, 21.6% were bleeding, 16.4% had calculus, and 11.4% had periodontal pockets. Six months later, in the same number of examined sextants, there were 52.6% healthy sextants, 19.8% of them bleed from gingival sulcus, and 11.8% had pockets. Thus, 5.2% sextants were healthier, 6.8% had reduced bleeding tendencies, calculus were present in 0.7% of sextants less than previously, and the percentage of sextants with pockets remained unchanged.

Table 8. CPITN index – group B

Tablica 8. CPITN indeks – grupa B

Sextant Check-up		0	1	2	3
I		8.1%	39.5%	41.1%	11.9%
II		18.8%	30.3%	39.5%	11.9%
Difference		10.7%	9.2%	1.6%	0 %

0 – healthy
1 – bleeding
2 – calculus
3 – pockets

0 – zdravi
1 – krvarenje
2 – kamenac
3 – džepovi

In group B, rinsing their oral cavity with »Meridol« once a day during one month, 186 sextants were tested in total at the beginning of the study and one month later. Only 8.1% of healthy sextants were found at the beginning; 39.5 were bleeding from gingival sulcus, 41.1% had calculus and 9.2% had pockets.

In control group KB, 174 sextants were examined. At the beginning of the study, 47.1% were healthy, 22.4% had bleeding tendencies, 20.7% had calculus, and 2.9% had pockets. A month later, 48.3% of the sextants were healthy (1.2% more than previously), while the percen-

tage with calculus and pockets remained almost unchanged.

Table 9. CPITN index – group K_BTablica 9. CPITN indeks – grupa K_B

Sextant Check-up		0	1	2	3
I		47.1%	22.4%	20.7%	9.2%
II		48.3%	21.8%	20.7%	9.8%
Difference		1.2%	0.6%	0 %	0.6%

0 – healthy
1 – bleeding
2 – calculus
3 – pockets

0 – zdravi
1 – krvarenje
2 – kamenac
3 – džepovi

Discussion and conclusion

This study showed that the use of »Meridol« mouth rinsing solution containing active substances, such as aminofluoride 297 and stannous fluoride (SnF₂), reduces the amount of plaque, the reduction being statistically significant for groups A and B (8, 9). A slight improvement in plaque reduction was even noted in control groups. This might be explained by and ascribed to the presence of dentists at the school where mouth rinsing was carried out.

The change in the periodontal status according to clinical findings in control groups was not statistically significant, which could be attributed to the presence of the dentist during each »Meridol« mouth rinsing. This change was due to too long rinsing intervals in group A (altogether once a week). In the control group KA oral hygiene instructions were needed in 21.6% of the sextants, calculus removal and oral hygiene instructions in 16.9% of the sextants, whereas in 11.2% complete treatment was necessary. Group B performed rinsing once per day, but for a short period of one month. The presence of bleeding from the gingival sulcus and layers of calculus following certain probe pressure, are the first signs of periodontal disease, requiring prophylactic treatment, i.e. removal of bacterial plaque and calculus.

The results, based on the CPITN index after the completion of the study, showed that 57.7% of the sextants in group A needed regu-

lar oral hygiene only; 6.8% of the sextants required education in oral hygiene; 17.9% of the sextants required calculus removal and additional education in oral hygiene, completed with full treatment; 16.4% needed oral hygiene instructions and calculus removal; 11.2% needed complete treatment. In group B, after a month of mouth rinsing with »Meridol« solution 30.3% of the sextants needed oral hygiene instructions, 39.5% needed calculus removal and oral hygiene instructions, and 11.9% needed complete treatment. In control group KB, 22.4% needed oral hygiene instructions, 20.7% needed calculus removal and instructions, while 9.2% needed complete treatment.

After the »Meridol« solution treatment, a slight reduction was observed in the number of sextants with bleeding. Some authors found a

reduction in bleeding tendencies with the application of SnF₂ (10).

When »Meridol« solution was used once a week for six months no side effects were recorded, e.g., no yellow coloration of the teeth, which was observed by other authors when some other mouth rinse solutions containing stannous fluoride were applied. No side effects were present even when »Meridol« solution was applied daily for a month.

In conclusion, we may say that »Meridol« mouth rinse solution is recommendable in the prophylactic treatment of decay and gingivitis along with regular and proper oral hygiene. This solution should also be recommended in cases with an increased risk of decay and gingivitis, as well as when oral hygiene has been neglected.

KOMPARATIVNA STUDIJA O DJELOVANJU MERIDOL TEKUĆINE NA SMANJENJE UPALNIH PROMJENA GINGIVE

Sažetak

U radu je ispitivan učinak Meridol tekućine za ispiranje usta (koja sadrži SnF₂ i amin fluorid 297) na plak i gingivu.

Ispitivanje je provedeno u četiri skupine djece. Skupina A ispirala je usta jedanput tjedno tijekom 6 mjeseci, skupina B jedanput dnevno tijekom mjesec dana, a skupine K_A i K_B bile su kontrolne.

Kriterij za objektivnu registraciju plaka bio je OHI – indeks prema Greenu i Vermillionu. Podaci o stanju parodonta dobiveni su primjenom CPITN indeksa. Smanjenje plaka u A i B skupini bilo je značajno. Primjenom samo Meridola nisu uočene promjene na parodontnom tkivu gdje je već došlo do bolesnih promjena, uočeno je jedino smanjenje sekstanta s krvarenjem iz gingivnoga sulcusa.

Rezultati ispitivanja pokazuju kako se Meridol tekućina može preporučiti u profilaksi karijesa i gingivitisa, uz odgovarajuće pravilno provođenje oralne higijene.

Ključne riječi: ispiranje usta, gingivitis, plak

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