# COMBINED EFFECT OF SUBGINGIVAL SCALING AND CONTROLLED ORAL HYGIENE ON THE INCIDENCE OF GINGIVITIS

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Several statistical investigations have shown a close relationship between the incidence of gingivitis and oral hygiene. Statistical analyses carried out by *Russell & co-workers* (1, 2, 3, 4) have demonstrated that gingivitis is more prevalent in rural than in urban populations of the same age group. However, when groups of the same educational standard were compared, differences were insignificant. This was considered to be due to a better oral hygiene. The much higher incidence of gingivitis and periodontitis in negroes than in white people could largely be attributed to a poorer oral hygiene. When groups maintaining the same standard of oral hygiene were compared, the periodontal conditions were similar. This led *Russell & co-workers* to the conclusion that: "Oral debris seemed to be the most deleterious factor of several studied".

In an examination of children and adults *Ladavalya & Harris* (5) found that mouths of good oral hygiene were free from gingival disturbances. *Ramfjord* (6) in a survey including 1,615 boys in Bombay, India, found a clear correlation between the calculus score and the gingivitis score. *Greene* (7), examining young males in Bombay, and in Atlanta, Georgia, U.S.A., observed that the oral hygiene scores in both groups coincided with the periodontal disease scores.

It is a widespread opinion among periodontists that successful prevention and treatment of periodontal disease, to a great

extent, depends on the co-operation between therapist and patient (*Hine* 8). The benefit of such a co-operation is repeatedly emphasized, but satisfactory statistical data to support these statements are scarce. *Massler et al.* (9) studied the effect of a "permissive" (non-controlled) toothbrushing in 154 Naval inductees. Each man was given a toothbrush and dentifrice and instructed to brush his teeth on rising and after each meal. Only 17.5 % showed improved cleanness, and only 9.7 % showed improved gingival conditions after 15 weeks.

In a study on the effects of closely supervised oral hygiene comprising 103 men from 18 to 56 years in Antarctica, *Adams & Stanmeyer* (10) found that a remarkable state of oral cleanness could be obtained by emphasizing proper toothbrushing techniques and oral hygiene. These results occurred only after the establishment of a close co-operation between dentist and patient.

The purpose of the present study was to evaluate the combined effect of subgingival scaling and controlled oral hygiene, i.e., measures which are focused on removal of local irritants in the form of calculus, bacterial plaque, food debris and overhanging margins of restorations.

It is well known to specialists in periodontics that a successful co-operation from the patient can be obtained in a large percentage of cases. On the other hand, patients referred to a specialist are particularly concerned about their teeth and usually respond positively to the instructions given. The second purpose of this study was, therefore, to find out to what extent the average person is willing to change his habits and subordinate to a new regimen, when proper instruction is given and control carried out.

## MATERIAL AND METHOD

At the start of the project, the material comprised 1,150 male and 278 female workers and staff members of a modern factory in Oslo. All the employees were invited to participate in the scheme and no selections were made.

Prior to treatment and instruction in oral hygiene, an extensive registration of the gingival and periodontal conditions

was made, including presence or absence of: gingivitis, pus-secretion, pathologic pocket depth, increased mobility, occlusal overload. Ten intraoral roentgenograms were taken of each patient and three photographs of the teeth in central occlusion (one taken from the front and one from each side). The frequency and efficiency of oral hygiene were also assessed.

Approximately 200 of the employees did not care to participate in the initial registration. A separate study showed that these persons had a considerably poorer oral health status than the participants (15). For further information about the initial examination of the present material the reader is referred to earlier publications (11—17).

At the first appointment after registration the patient was informed about the lack of efficiency of his oral hygiene, and he was instructed in proper home-care comprising both horizontal and vertical brushing, *Charter's* method if necessary, and interdental cleansing by means of toothpicks. The importance of cleansing the tooth surfaces difficult of access was particularly emphasized. At every new sitting the efficacy of the oral hygiene was checked and, if necessary, the instructions were repeated.

The treatment consisted of a thorough removal of supragingival and sub-gingival deposits by means of proper instruments, the size of which permitted access to even very deep pockets (17). The project was limited to a period of five years, and during this time the patients were re-called every 6 months, in severe cases every 3 months.

No other treatment, such as gingivectomy or occlusal adjustment, was given in order not to complicate the evaluation of the effect of the particular principle of therapy under investigation.

At the end of the experimental period a registration, similar to the initial one, was carried out. This final registration was made approximately 3 months after the last treatment by the same examiners, using the same criteria.

During the final registration the three examiners repeatedly controlled each other as they had done during the initial registration in order to attain uniformity both between examiners

and between the initial and final registrations. In this effort the clinical photographs were of great help. Particularly changes in texture, swelling and recession could be assessed by these means. The possibility that the examiner's error should have influenced the final data in either direction to any appreciable extent seems, therefore, unlikely.

At the final registration all the participants were given a score for "co-operation", i.e., the efficiency of oral hygiene and compliance to the instructions.

The present paper deals with the changes in the *incidence of gingivitis* following the treatment.

## OBSERVATIONS

### A. Incidence of gingivitis prior to treatment

Prior to treatment the number of gingival units (buccal, lingual, mesial and distal) showing signs of gingivitis were counted. By comparing this number with the total number of gingival units the gingivitis percentage for each gingival unit could be assessed.

Table 1 shows the distribution of the persons according to age and efficiency of oral hygiene at the beginning (A) and at the end (B) of the five year period.

**Table 1.**

*Number of patients.*

| Age at the initiation of the period | Grade of oral hygiene at the initiation of the five year period | | | | | | Total | | Full dentures |
|---|---|---|---|---|---|---|---|---|---|
| | Good | | Fairly good | | Not good | | | | |
| | A | B | A | B | A | B | A | B | |
| Below 20 | 3 | 1 | 18 | 8 | 0 | 0 | 21 | 9 | 0 |
| 20—29 | 74 | 39 | 230 | 113 | 36 | 20 | 340 | 172 | 2 |
| 30—39 | 88 | 58 | 329 | 215 | 130 | 59 | 547 | 332 | 14 |
| 40—49 | 29 | 28 | 163 | 123 | 133 | 71 | 325 | 222 | 35 |
| 50—59 | 4 | 3 | 53 | 40 | 41 | 27 | 98 | 70 | 26 |
| 60 and more | 0 | 0 | 2 | 1 | 8 | 2 | 10 | 3 | 10 |
| Total | 198 | 129 | 795 | 500 | 348 | 179 | 1,341 | 808 | 87 |

A = Number of patients at the initiation of the five year period.
B = Number of patients who completed the five-year scheme.

**Table 2.**

*Average percentage of gingivitis at the initiation of the five year period.*

| Age | Grade of oral hygiene | | | | | |
|---|---|---|---|---|---|---|
| | Good | | Fairly good | | Not good | |
| | A | B | A | B | A | B |
| | Buccal surface | | | | | |
| 20—29 | 34.6 | 29.1 | 51.9 | 60.1 | 93.8 | 92.8 |
| 30—39 | 39.2 | 41.5 | 66.1 | 67.6 | 96.6 | 96.1 |
| 40—49 | +9.6 | 51.2 | 66.4 | 68.1 | 96.4 | 96.2 |
| 50—59 | — | — | 72.6 | 75.6 | 95.5 | 94.8 |
| | Lingual surface | | | | | |
| 20—29 | 66.1 | 64.1 | 77.8 | 81.9 | 95.8 | 95.1 |
| 30—39 | 73.5 | 75.6 | 90.4 | 92.3 | 98.9 | 99.4 |
| 40—49 | 77.3 | 79.2 | 91.8 | 92.2 | 99.4 | 100.0 |
| 50—59 | — | — | 93.9 | 94.1 | 98.3 | 98.3 |
| | Interproximal surfaces | | | | | |
| 20—29 | 82.2 | 78.6 | 95.7 | 96.3 | 100.0 | 100.0 |
| 30—39 | 85.4 | 85.0 | 98.1 | 98.5 | 99.8 | 100.0 |
| 40—49 | 83.2 | 81.9 | 98.8 | 99.0 | 99.8 | 100.0 |
| 50—59 | — | — | 98.5 | 99.0 | 97.8 | 96.9 |

A = Data for all patients.

B = Data for those patients only who completed the five year scheme.

The influence of age and oral hygiene on the incidence of gingivitis in the different gingival units is demonstrated in Table 2. Groups counting less than 10 individuals were excluded. This table contains two sets of data: (A) the percentage of the incidence of gingivitis in *all* patients and (B) the corresponding data for those patients who completed the five year scheme.

### B. Incidence of gingivitis after 5 years

During the experimental period some of the participants left the factory, while others lost interest in the scheme and did not appear for further treatment. It is seen that the loss, on an average, was greatest in the group "hygiene not good". In this group were found most of the patients who had little understanding of the project and, consequently, did not care to go to the extra effort required.

The gingivitis percentage after the five year period is shown in Table 3, A, which is comparable to Table 2.

**Table 3.**

*Average percentage of gingivitis at the end of the five year period, and ratio between the percentage of gingivitis at the end and at the initiation of the period.*

| Age at the initiation of the period | Grade of oral hygiene | | | | | |
|---|---|---|---|---|---|---|
| | Good | | Fairly good | | Not good | |
| | A | B | A | B | A | B |
| | Buccal surface | | | | | |
| 20—29 | 1.5 | 0.05 | 9.6 | 0.16 | 43.9 | 0.47 |
| 30—39 | 6.1 | 0.15 | 13.4 | 0.20 | 31.5 | 0.33 |
| 40—49 | 6.8 | 0.13 | 16.2 | 0.24 | 31.4 | 0.33 |
| 50—59 | — | — | 30.5 | 0.40 | 38.5 | 0.41 |
| | Lingual surface | | | | | |
| 20—29 | 4.0 | 0.06 | 18.4 | 0.22 | 56.9 | 0.60 |
| 30—39 | 10.8 | 0.14 | 24.1 | 0.26 | 49.6 | 0.50 |
| 40—49 | 11.2 | 0.14 | 27.8 | 0.30 | 50.9 | 0.51 |
| 50—59 | — | | 38.3 | 0.41 | 60.7 | 0.62 |
| | Interproximal surfaces | | | | | |
| 20—29 | 5.5 | 0.07 | 25.2 | 0.26 | 62.7 | 0.63 |
| 30—39 | 14.6 | 0.17 | 30.8 | 0.31 | 56.1 | 0.56 |
| 40—49 | 14.8 | 0.18 | 35.7 | 0.36 | 57.0 | 0.57 |
| 50—59 | — | | 43.7 | 0.44 | 64.1 | 0.66 |

A = Average percentage of gingivitis at the end of the five year period.

B = Ratio between the percentage of gingivitis at the end and at the initiation of the period.

**Table 4.**

*Ratio and difference between the percentage of gingivitis at the end and at the initiation of the five year period when all age groups are pooled.*

| Surfaces | Grade of oral hygiene | | | | | |
|---|---|---|---|---|---|---|
| | Good | | Fairly good | | Not good | |
| | A | B | A | B | A | B |
| Buccal..... | 0.12 | 35.0 | 0.22 | 52.1 | 0.35 | 61.7 |
| Lingual..... | 0.12 | 64.0 | 0.28 | 65.1 | 0.53 | 46.4 |
| Interproximal | 0.14 | 70.5 | 0.32 | 66.4 | 0.59 | 41.1 |
| Total | 0.13 | 60.0 | 0.29 | 62.5 | 0.52 | 47.6 |

A = Ratio between the percentage of gingivitis at the end and at the initiation of the five year period when all age groups are pooled.

B = Difference between the percentage of gingivitis at the initiation and at the end of the five year period when all age groups are pooled.

### C. Results of treatment and oral hygiene

The effect of the scheme can be evaluated by comparing (dividing) the percentage of the incidence of gingivitis at the end of the period with that in the same patients at the beginning. These ratios are found in Table 3, B, and show that the total decrease in the incidence of gingivitis is very great. It is most pronounced in the group: "good hygiene", less in the "fairly good" and least in the "not good". This is true for all the surfaces. The significance of age seems to be less pronounced, except for the patients below 30 years. Therefore, the relationship between the gingivitis frequency at the *end* of the period and at its *beginning* is also calculated on an average for all age groups (Table 4 and Diagram 1).

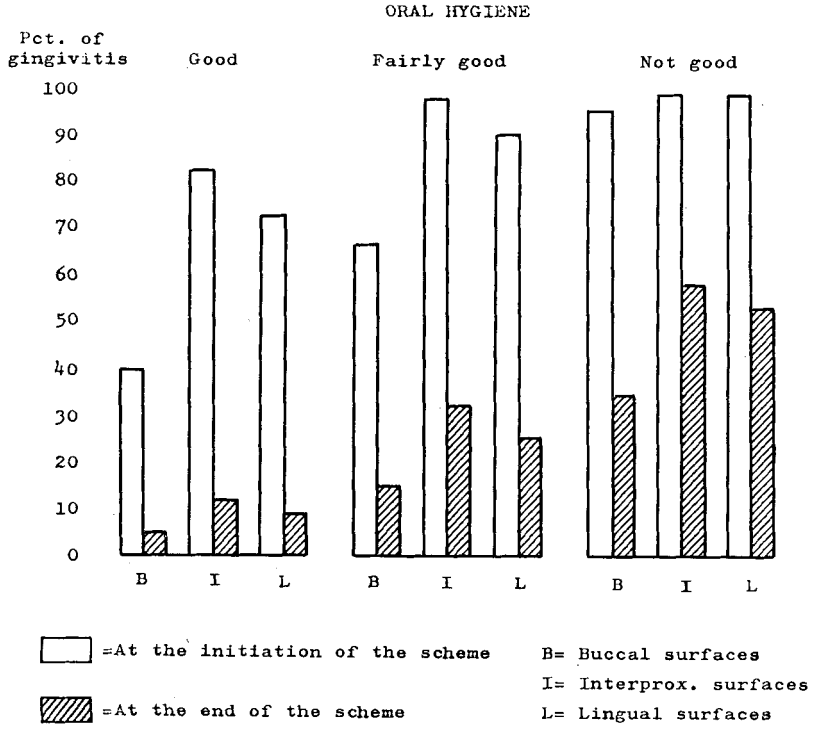



Diagram 1. Percentage of gingivitis at the initiation and at the end of the five year period.

### D. Effect of co-operation

The best co-operation was established with those who at the beginning had a good oral hygiene (Table 5).

The effect of co-operation on the reduction of gingivitis is demonstrated in Table 6 and Diagram 2. Table 6 shows the average gingivitis percentage at the conclusion of the period in the group of men with "fairly good" hygiene, calculated

**Table 5.**

*Distribution of persons according to grade of co-operation.*

| Age | Good oral hygiene at the beginning | | | Fairly good oral hygiene at the beginning | | | Not good oral hygiene at the beginning | | |
|---|---|---|---|---|---|---|---|---|---|
| | Grade of cooperation | | | Grade of cooperation | | | Grade of cooperation | | |
| | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| 20—29 | 38 | 1 | 0 | 60 | 51 | 2 | 3 | 13 | 4 |
| 30—39 | 53 | 5 | 0 | 122 | 90 | 3 | 10 | 41 | 8 |
| 40—49 | 25 | 3 | 0 | 53 | 68 | 2 | 16 | 52 | 3 |
| 50—59 | 1 | 2 | 0 | 18 + 2 | 17 + 3 | 0 | 5 | 18 + 2 | 3 |

Grade of co-operation: 1=good, 2=fairly good, 3=not good.

**Table 6.**

*Average percentage of gingivitis at the end of the five year period calculated separately for different grades of co-operation. Data only for men with fairly good oral hygiene at the initiation of the five year period.*

| Age at the initiation of the period | Grade of co-operation | |
|---|---|---|
| | Good | Fairly good |
| | Buccal surface | |
| 20—29 | 4.8 | 17.6 |
| 30—39 | 7.2 | 22.8 |
| 40—49 | 4.9 | 21.0 |
| 50—59 | 3.9 | 63.4 |
| | Lingual surface | |
| 20—29 | 9.9 | 31.5 |
| 30—39 | 12.2 | 40.0 |
| 40—49 | 10.8 | 40.0 |
| 50—59 | 13.3 | 74.9 |
| | Interproximal surfaces | |
| 20—29 | 15.9 | 41.6 |
| 30—39 | 15.2 | 51.4 |
| 40—49 | 16.5 | 48.9 |
| 50—59 | 23.2 | 80.0 |

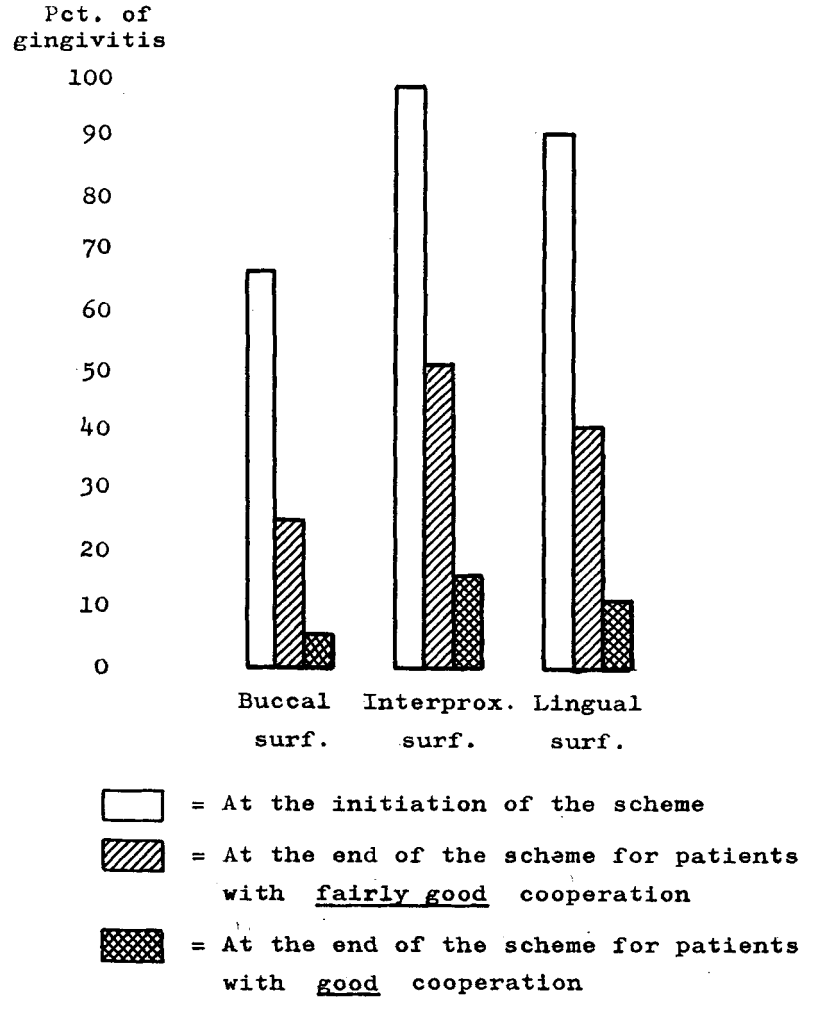



Diagram 2. Percentage of gingivitis at the initiation and at the end of the five year period for patients having fairly good oral hygiene.

separately for those who yielded "good" and those who yielded "fairly good" co-operation. There were so few patients with "not good" co-operation that they were excluded from this analysis. The group, "men with fairly good hygiene" was chosen, because this group would give the most representative figures. It is seen that the incidence of gingivitis at the end of the period

in all age groups is definitely smaller in the group with "good co-operation" than in the group with "fairly good co-operation".

### E. Effect of tooth mortality on reduction of incidence of gingivitis

The possibility must be considered that the loss of teeth may have contributed to the improvement of gingival conditions. If a number of teeth with gingivitis had been extracted during the period, this would have contributed to a reduction of the gingivitis percentage, independent of the hygienic measures. In Table 7 the tooth mortality percentages at the beginning and at the end of the five year period are given. It is apparent that the loss of teeth as a whole is very low in all age groups. On an average, it is smallest in the group with "good" hygiene, somewhat higher in the "fairly good" group and highest in the "not good" group.

In Table 8 all the age groups are pooled and the average loss of teeth during the five year period is calculated for the different hygiene groups. These figures are compared with those of "normal" loss of teeth which could be calculated on basis of the data from the initial registration. The actual loss is 0.4, 0.6 and 0.9 for the three groups in question. This is definitely

**Table 7.**

*Average loss of teeth for all patients who completed the five year scheme.*

| Age at the initiation of the five year period | Grade of oral hygiene | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Good | | | Fairly good | | | Not good | | |
| | Loss of teeth | | | Loss of teeth | | | Loss of teeth | | |
| | at the initiation of the period | at the end of the period | during the period | at the initiation of the period | at the end of the period | during the period | at the initiation of the period | at the end of the period | during the period |
| 20—24 | 1.2 | 1.3 | 0.1 | 1.9 | 2.3 | 0.4 | — | — | — |
| 25—29 | 3.9 | 4.1 | 0.2 | 3.7 | 4.0 | 0.3 | 4.9 | 5.8 | 0.9 |
| 30—34 | 4.5 | 4.8 | 0.3 | 6.0 | 6.3 | 0.3 | 10.8 | 12.1 | 1.3 |
| 35—39 | 5.8 | 6.2 | 0.4 | 6.8 | 7.3 | 0.5 | 11.6 | 13.3 | 1.7 |
| 40—44 | 6.9 | 7.3 | 0.4 | 8.7 | 9.3 | 0.6 | 12.6 | 13.3 | 0.7 |
| 45—49 | 7.5 | 8.2 | 0.7 | 10.8 | 11.7 | 0.9 | 15.2 | 15.8 | 0.6 |
| 50—54 | — | — | — | 10.2 | 11.3 | 1.1 | 14.4 | 15.4 | 1.0 |
| 55—59 | — | — | — | 7.3 | 8.2 | 0.9 | 19.8 | 20.2 | 0.4 |

Table 8.

*Average loss of teeth during the five year period and "normal" loss of teeth.*

| | Grade of oral hygiene | | |
|---|---|---|---|
| | Good | Fairly good | Not good |
| "Normal" loss of teeth. Estimate based on the data which were recorded at the initiation of the period | 1.1 | 1.4 | 1.8 |
| Actual loss of teeth during the five year period | 0.4 | 0.6 | 0.9 |

smaller than the corresponding "normal" tooth mortality (1.1, 1.4, and 1.8). It is obvious that such a small degree of tooth mortality cannot influence the gingivitis percentage to any appreciable degree. Therefore, the reduction in the incidence of gingivitis cannot even partly be ascribed to tooth mortality.

## DISCUSSION

### A. Incidence of gingivitis prior to treatment

The influence of oral hygiene on the incidence and distribution of gingivitis is clearly demonstrated in Table 2. Individuals with "fairly good" oral hygiene have more gingivitis than those with "good", but less than those with "not good". The difference is greatest for the buccal surfaces, less for the lingual and least for the interproximal surfaces. The gingivitis percentage is also lower on the buccal and higher on the interproximal surfaces when the same age groups are compared, but the difference is more pronounced in the individuals with "good" and "fairly good" hygiene. In the group with "not good" hygiene the incidence of gingivitis is very close to 100 % on all the surfaces. The effect of age is also to a certain degree reduced in this group, apparently due to the fact that the older age groups, on an average, had a much poorer oral hygiene than the younger age groups. However, distinct correlation between oral hygiene and incidence and prevalence of gingivitis is found in all age groups.

It may appear surprising that the marked difference in the incidence of gingivitis between the buccal, lingual and interproximal surfaces is found even in the groups with "good" oral

hygiene. The fact that gingivitis is most prevalent in the interproximal area, even among those with "good" hygiene, must be due to their oral hygiene habits. Hardly any person, even among the meticulous toothbrushers, used dental floss or picks, which are essential for effective interdental cleansing.

### B. Result of treatment during the five year period

As a whole, the incidence of gingivitis is considerably smaller at the end of the five year period (Table 3) than at its beginning (Table 2, B). Also the distribution of gingivitis shows the same trends: the buccal surfaces are still the least affected and the approximal surfaces the most. Similar to the conditions before treatment, gingivitis is most prevalent in the "not good" hygiene group and least prevalent in the "good" group. On the other hand, the correlation between age and gingivitis percentage is not so pronounced.

It is evident that a considerable reduction in the incidence of gingivitis has taken place during the five years, and as there were no other variables, these changes must be due to the combined effect of subgingival scaling and improved oral hygiene. The reduction is greatest in the group which from the beginning had a "good" hygiene (Table 3), and least among those with a "poor" hygiene. This is true for all the surfaces. When all the surfaces are pooled, the gingivitis percentage is reduced to approximately 1/8 in individuals with "good" hygiene. Furthermore, the relative reduction is greatest on the buccal surfaces. This finding was quite surprising, as a relatively higher reduction might have been expected lingually and interproximally in view of the fact that during the entire experimental period special emphasis was put on the treatment of these surfaces both by the therapist and by the patient. The explanation seems to be that the majority of the pathologically deepened pockets were found on the interproximal and lingual surfaces. With reference to the technical difficulties connected with the complete removal of calculus and plaque in pockets of some depth it has previously been stated by the present authors (11), that the successful treatment of pockets of more than five millimeters generally requires surgical reduction of the pockets. As the main object of this project was to evaluate the effect of one type of treatment exclusively, i.e., sub-

gingival scaling, this treatment alone was employed even if the pockets were 10 millimeters deep or more. Gingivectomy was never resorted to, even when obvious indications were present. This probably accounts for the incidence of gingivitis not being more reduced on the interproximal and lingual surfaces, respectively.

When, however, the absolute differences are considered (Table 4, B) it is seen that the incidence of gingivitis prior to and at the conclusion of the period, is greater on the interproximal than on the buccal surfaces in the "good" and "fairly good" toothbrushers.

In the group with "not good" hygiene, the reduction was smallest interproximally and greatest buccally, both absolutely and relatively. This again may be explained by the fact that the "not good" toothbrushers initially had the largest number of pathologically deepened pockets, and that these pockets most frequently were located to the interproximal and lingual surfaces, respectively.

When all the age groups are pooled (Table 4), the absolute difference is also greatest in the "efficient" patients and smallest in the "not good".

The influence of improved oral hygiene on the incidence of gingivitis is also apparent when the co-operation of the patients is studied over the five year period (Table 6). The reduction in the incidence of gingivitis was significantly greater in the group with good co-operation than in that with medium co-operation. This study corroborates the observations by *Adams & Stanmeyer* (10), namely, that a remarkable state of oral cleanness can be obtained if proper instruction were given and control carried out periodically.

More than half the participants showed good co-operation and only 3.2 % did not respond at all. However, the last figure obviously gives a too favorable impression as most of those who did not co-operate refused to continue, for which reason they did not appear for the final examination. On the other hand, if it may be calculated that 50 % of the population can be influenced, improvement of oral hygiene would be a public health measure of great importance.

The present material shows that a marked reduction in tooth

loss took place during the period (Tables 7 and 8). The average loss of teeth in the "good" toothbrushers was reduced to one third, in the "fairly good" to less than one half and in the "not good" to one half of the "normal" loss of teeth. The effect of the hygienic measures is, therefore, well established. To what extent the scheme made the participants more "tooth-minded", and consequently less inclined to have teeth extracted, will be subject to further analyses.

The present analysis shows that the combined effect of subgingival scaling and controlled oral hygiene definitely reduces the incidence of gingivitis and tooth loss. However, it also shows that subgingival scaling, as a therapeutic means, has its limitations. In pockets of more than 5 millimeters it was apparent that the difficulties in complete removal of calculus and plaque could not be overcome in a large number of cases. On the other hand, this investigation shows that a fairly good result can be achieved, even in very deep pockets, if the co-operation is good.

## SUMMARY AND CONCLUSIONS

The combined effect of subgingival scaling and controlled oral hygiene was evaluated over a period of five years in a group originally comprising 1,428 men and women. The gingival conditions were carefully registered prior to treatment and after its conclusion. The treatment exclusively consisted in meticulous subgingival scaling at six months' intervals. The patients were instructed in proper oral hygiene, including interdental cleansing with toothpicks. The oral hygiene was checked and, if needed, improved at every new sitting.

The statistical analysis of the initial data showed that the incidence of gingivitis increased with age. Gingivitis is more prevalent on the interproximal surfaces than on the lingual and buccal surfaces, respectively. Individuals with "good" oral hygiene are less susceptible to gingivitis than those with "fairly good" oral hygiene and the latter, in turn, less than those with "not good" hygiene.

Meticulous subgingival scaling and controlled oral hygiene resulted in an average reduction of the incidence of gingivitis to

*one eighth* in individuals who started with a "good" oral hygiene, to approximately *one third* in those starting with a "fairly good" and to *one half* in those who started with a "not good" oral hygiene, Diagram 1.

The decrease in the incidence of gingivitis was greatest in the individuals who yielded good co-operation and greater on the buccal than on the lingual and interproximal surfaces, respectively. Age did not seem to play any role in the healing, Diagram 2.

The best co-operation was found in those persons who originally had the best oral hygiene.

As a consequence of the scheme, tooth loss was reduced to approximately *one half* as compared with "normal" tooth loss.

This analysis clearly demonstrates that strict hygienic measures are effective tools in the prevention of gingivitis. However, it also shows that absence of pathologically deepened pockets is essential for success. *Thus, the hygienic measures should start as early as possible in life.*

## RÉSUMÉ ET CONCLUSIONS

### ACTION COMBINÉE DU DÉTARTRAGE SOUS-GINGIVAL ET DU CONTRÔLE DE L'HYGIÈNE BUCCALE SUR L'INCIDENCE DES GINGIVITES

L'action combinée du détartrage sous-gingival et du contrôle de l'hygiène buccale a été estimée sur un groupe comprenant à l'origine 1 428 hommes et femmes, pendant une période de cinq ans. L'état de la gencive a été soigneusement enregistré avant le début du traitement et après sa terminaison. Le traitement consistait exclusivement en détartrages sous-gingivaux méticuleux effectués à des intervalles de six mois. Il était prescrit aux patients une technique d'hygiène buccale appropriée comprenant le nettoyage interdentaire à l'aide de cure-dents. La technique d'hygiène buccale était contrôlée à chaque séance, et, le cas échéant, améliorée.

L'analyse statistique des données initiales a montré que la fréquence des gingivites augmente avec l'âge. Les gingivites sont plus fréquentes au niveau des surfaces interproximales qu'au niveau des surfaces linguales et qu'au niveau des surfaces vestibulaires. Les personnes ayant une "bonne" hygiène buccale sont moins sujettes aux gingivites que celles ayant une "assez bonne"

hygiène buccale, et celles-ci à leur tour moins que celles ayant une hygiène "défectueuse".

Les détartrages sous-gingivaux méticuleux et le contrôle de l'hygiène buccale ont eu pour résultat une réduction de la fréquence des gingivites aboutissant en moyenne à: *un huitième* chez les sujets ayant dès le début une "bonne" hygiène buccale; *un tiers* environ chez ceux ayant au début une "assez bonne" hygiène; et *un demi* chez ceux ayant au début une hygiène buccale "défectueuse". Diagramme I.

Le diminution de la fréquence des gingivites était plus grande chez les sujets apportant une bonne collaboration et plus grande au niveau des surfaces vestibulaires qu'au niveau des surfaces linguales et qu'au niveau des surfaces interproximales. L'âge ne semblait pas jouer de rôle pour la cicatrisation. Diagramme II.

La meilleure collaboration a été celle qu'on a trouvée chez les personnes ayant à l'origine la meilleure hygiène buccale.

La conséquence de cet ensemble de traitements a été une réduction de la perte des dents qui a été ramenée à approximativement *un demi* par rapport à la perte "normale" des dents.

Cette analyse démontre clairement que des mesures hygièniques strictes représentent une arme efficace dans la prévention des gingivites. Elle montre cependant en même temps que l'absence de culs-de-sac de profondeur pathologique est essentielle pour le succès. *Par conséquent, il faut commencer à appliquer ces mesures hygieniques à un moment aussi précoce que possible de l'existence.*

## ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

### ZAHNSTEINENTFERNUNG UND MUNDHYGIENE IN IHRER WIRKUNG AUF DEN ZUSTAND DES MARGINALEN ZAHNFLEISCHES

Die kombinierte Wirkung von subgingivaler Zahnsteinentfernung und kontrollierter Mundhygiene wurde bei 1 428 Patienten über einen Zeitraum von fünf Jahren beobachtet.

Der Zustand der Gingiva wurde vor und nach der Behandlung sorgfältig untersucht. Die Behandlung bestand ausschliesslich aus peinlich genauer Entfernung des subgingivalen Zahnsteines in sechsmonatigen Intervallen. Die Patienten wurden zu gründlicher Mundpflege angehalten, auch zur Säuberung der Interdentalräume mit Zahnstochern.

Falls es erforderlich war, wurde in jeder Sitzung eine Mundbehandlung durchgeführt.

Anhand der Ausgangsdaten konnte festgestellt werden, dass mit zunehmendem Alter häufiger Gingivitiden auftraten. Eine Entzündung der Gingiva tritt häufiger in den Interdentalräumen als buccal und lingual auf.

Patienten mit guter Mundhygiene sind weit weniger empfänglich für Gingivitiden als solche mit weniger guter oder sogar schlechter Mundhygiene.

Die peinlich genaue Zahnsteinentfernung und die Kontrolle der Mundhygiene führten im allgemeinen zu einem Rückgang der Gingivitis, und zwar um $^1/_8$ bei den Patienten, die von Anfang an eine gute Mundhygiene aufwiesen, annähernd um $^1/_3$ bei denen, die mit weniger guter und um die Hälfte bei denen, die mit schlechter Mundhygiene begonnen hatten. Diagramm 1.

Der Rückgang der Gingivitis war am stärksten bei den Patienten, die eine gute Zusammenarbeit zeigten, und zwar mehr buccal und lingual als interdental. Das Alter scheint keinen Einfluss auf die Heilung einer Gingivitis zu haben. Diagramm 2.

Die beste Mitarbeit zeigten die Patienten, die von Anfang an eine gute Mundpflege getrieben hatten.

Die Schlussfolgerungen aus dieser Übersicht sind folgende: Der Zahnverlust kann bei dieser Behandlung, verglichen mit dem normalen Zahnverlust, etwa um die Hälfte reduziert werden.

Diese Untersuchungen zeigen klar, dass peinliche Mundhygiene ein wirksames vorbeugendes Mittel für eine Gingivitis ist. Trotzdem muss noch gesagt werden, dass die Entfernung pathologisch tiefer Taschen für die Heilung unerlässlich ist. *Demgemäss muss mit peinlicher Mundhygiene so früh wie möglich im Leben begonnen werden.*

## RESUMEN Y CONCLUSIONES

### EFECTO COMBINADO DE LA HIGIENE BUCAL CONTROLADA Y EL RASPADO SUBGINGIVAL SOBRE LA FRECUENCIA DE LA GINGIVITIS

El efecto combinado del raspaje subgingival y una higiene bucal controlada fué evaluada en un grupo que originariamente comprendía 1 428 hombres y mujeres, en un período de cinco años.

La afección gingival fué cuidadosamente registrada previa al tratamiento y después de su terminación. El tratamiento consistió exclusivamente en un raspaje y curetaje subgingival con intervalos de seis meses. Se instruyó al paciente en una correcta higiene bucal, que incluía limpieza interdental con mondadientes. La higiene bucal fué controlada, y cuando hubo necesidad, mejorada en cada nueva cita.

El análisis estadístico del primer control mostró que la incidencia de la gingivitis aumentó con la edad. La gingivitis prevalece más en caras interproximales que sobre las caras linguales y vestibulares respectivamente.

Los individuos con buena higiene bucal son menos suceptibles a la gingivitis que aquellos con una higiene regular, y estos últimos a su vez, menos que los que presentan una mala higiene.

El raspaje y curetaje subgingival meticuloso y una higiene bucal controlada dieron por resultado que la gingivitis se redujera en: *un octavo* en individuos que comenzaron con una buena higiene bucal; *un tercio* en los que empezaron con una higiene regular y *una mitad* para los que empezaron con una mala higiene. Trazado 1.

El grado en la incidencia de la gingivitis fué mayor en individuos que mostraron buena cooperación y mayor en las caras bucales que en las linguales e interproximales respectivamente. La edad no parece jugar un papel importante en la curación. Trazado 2.

La mejor cooperación se encontró en esas personas que originariamente tenían la mejor higiene bucal.

Como consecuencia de este plan, la pérdida dentaria se redujo a *la mitad* aproximadamente comparándola con la pérdida dentaria normal. Este análisis demuestra claramente que las medidas estrictas de higiene son efectivas en la prevención de la gingivitis. Sin embargo, también muestra que es esencial para el éxito la ausencia de bolsas patológicas profundas. *Es por ello que las medidas higiénicas deben comenzar tan temprano en la vida como sea posible.*

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