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(Head: Professor G. OLIN.)

What Rôle do Treponema Vincenti play in Certain Diseases of the Gingiva.

By

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In an earlier work[1] the present author endeavoured to draw attention to the fact that in cases of Angina vincenti, Stomatitis ulcerosa and Noma, the spirochete Treponema vincenti was always present in large numbers and always in closest proximity to the healthy tissue, so that it might justifiably be said that these spirochetes lead the bacterial invasion (SMITH[2]). Further, it was pointed out that it was extremely probable that these diseases always originate from simple gingivitis on the basis of an existing avitaminosis or some other morbid condition which weakened the organism's powers of resistance (SMITH). As the present author has found no statements in the literature about the occurrence of Treponema vincenti in normal gingiva, in cases of gingivitis, paradentitis marginalis superficialis and paradentitis marginalis profunda, and as the elucidation of the etiology of these extremely common diseases would be of importance, he commenced the following investigation.

All the specimens were taken with a straight platinum wire, somewhat flattened at the point. It was employed to take specimens from pockets in the interdental spaces in the gingiva both from patients in my private practics in Stockholm and Dalarö, and from the staff at the Bacteriological Laboratory. Specimens

[1] KLEIN, HARRY, S., Oral Spirochetes, Their Occurence in Diseases of the Oral Cavity, etc. Acta Odont. Scand. 1943: 1.
[2] SMITH, D. T., Fuso-Spirochetal Disease. London 1932.

were taken from the upper jaw and the lower jaw, careful notes on the condition of the gingiva being made at the same time. The specimens were smeared on a slide in physiological saline solution and allowed to dry in the air, and subsequently were very slightly flamed. Finally they were stained in accordance with a method based on the author's experiments, and it was found that of the mouth spirochetes practically only Treponema vincenti took the stain. Subsequently the number of Treponema vincenti in a field of vision was counted with a microscope in three different places in the preparation. The author then found that a certain relation appeared to exist between the number of Treponema vincenti and the degree of morbidity in the gingiva. He therefore considered it desirable to pursue the investigations by more exact methods.

Squares with a superficial area of 10 × 10 mm were imprinted on a slide by means of a rubber stamp and Pelikan's waterproof ink 84 T. Material which had been taken in the manner described above was spread out in physiological saline solution within the square so as to leave as even a surface as possible over the whole square. The specimens were again taken from both the lower and upper jaws, careful notes being made about the condition of the gingiva. The preparations were airdried and flamed, after which they were stained in accordance with the author's special method: Staining with carbol-gentian violet solution 30 seconds, then rinsing with water and afterstaining with Ziehl-Neelsen's carbolfuchsin 30 seconds, rinsing with water. Airdrying. With an immersion lens the number of Treponema vincenti in three fields of vision were then counted along one diagonal, viz. firstly, the upper left corner, secondly, the centre, and thirdly, the lower right corner. In some series five fields of vision along the diagonal were counted. The average number of the determinations made was calculated in each individual case. The investigation comprised a total of 71 cases. The results are given in the following tables.

It appears from these tables that the number of Treponema vincenti is small in the group comprising cases with apparently normal gingiva, but considerably higher in the group with morbid conditions in the gingiva. It was possible to prove up to 8 spirochetes in apparently normal gingiva. Not until higher values were obtained was it possible to observe morbid changes in the gingiva with the naked eye. This circumstance might perhaps be of help for the early diagnosis of diseases of the gingiva.

The three different clinical pictures of gingival diseases, gingivitis simplex, paradentitis marginalis superficialis and paradentitis marginalis profunda, also exhibit divergent values among themselves, the lowest in cases of gingivitis and the highest in cases of deep paradentitis. The circumstance that these gingival diseases exhibit serially rising numbers of spirochetes, accords well with the author's assumption that Treponema vincenti plays an important etiological rôle as regards these morbid conditions.

Table 1.

11 cases from the staff of the State Bacteriological Laboratory

Number of Treponema Vincenti.

Apparently normal gingiva		Gingivitis Simplex		Paradent. marg. sup.	
Upper jaw	Lower jaw	Upper jaw	Lower jaw	Upper jaw	Lower jaw
2.4	0	41.0	6.4		88
2.4	0		18.0		35.6
0	0		7.6		
0	0				
0	1.4				
0	1.2				
0					
0					
0					
0					
Average 0.5	0.4	41	10.6		61.8

Table 2.

10 children between the ages of 7—14 years from the same school and the same island in the skerries.

Number of Treponema Vincenti

Apparently normal gingiva		Gingivitis Simplex		Paradent. marg. sup.	
Upper jaw	Lower jaw	Upper jaw	Lower jaw	Upper jaw	Lower jaw
0	6	7	13	18	19.3
0.3	8	5	13		
1.3	4.6		8.6		
1.3	0				
0	3				
1.3	2.3				
2.3					
Average 0.9	4	6	11.5	18	19.3

Table 3.

50 cases from private practice in Stockholm.

Number of Treponema Vincenti.

Apparently normal gingiva		Gingivitis Simplex		Paradent. marg. sup.		Paradent. marg. prof.	
Upper jaw	Lower jaw	Upper jaw	Lower jaw	Upper jaw	Lower jaw	Upper jaw	Lower jaw
6	2.6	9.3	7.6	39.3	22	33	80
0	0	6.6	7.6	42	19.3	76.6	23.3
7	0	9	11	31	22.3	61	24
4.6	1.6	9.3	7·6	24	16	40	49.3
1	0	12.3	10	29	34	49.6	70.3
0	6	5	9.3	18.6	16.3	26.3	48.3
0	1.6	10	13	20	18.3	56.6	48
0.3	0	14	8.6	19	18	27.3	
1.3	2.3		12.3		28.6		
0	0				18		
1	5.3						
0	0						
1	4.3						
0	0						
5.6	0.3						
0.6	1.3						
0.6	2.3						
0	0						
4.3	0						
0	0.3						
0.3	0						
0	2.3						
0.3	1.3						
0	0						
0							
0							
Average 1.3	1.3	9.4	9.6	27.8	21.3	46.3	49

Table 4.

Table of the whole material.

Mean values for the different groups + total average value for each morbid group.

		S.B.L.		Patients		School-children		Total	
		M.V.	No. C.	M.V.	No. C.	M.V.	No. C.	M.V.	No. C.
Apparently normal gingiva	Upper jaw	0.5	10	1.3	26	0.9	7	1	43
	Lower jaw	0.4	6	1.3	24	4	6	1,6	36
Ging. simpl.	Upper jaw	41	1	9.4	8	6	2	11.7	11
	Lower jaw	10.6	3	9.6	9	11.5	3	10.2	15
Parad. marg. sup.	Upper jaw			27.8	8	18	1	26.7	9
	Lower jaw	61.8	2	21.3	10	19.3	1	25.8	13
Parad. marg. prof.	Upper jaw			46.3	8			46.3	8
	Lower jaw			49	7			49	7

M. V. = Mean value.
No. C. = Number of cases.

Summary.

The author determined the number of Treponema vincenti in specimens from pockets in the gingiva both of persons with apparently normal gingiva, and in cases of gingivitis, paradentitis marginalis superficialis or profunda, and established that the number of spirochetes was smallest in the normal cases, higher in the cases of gingivitis and superficial paradentitis, and highest in the cases of deep paradentitis. The author considers that these observations support the assumption that these spirochetes are of etiological significance for the gingival diseases in question.

Zusammenfassung.

Verf. bestimmte die Anzahl Treponema Vincenti in den Zahnfleischtaschen sowohl bei Menschen mit anscheinend normalem Zahnfleisch als auch bei Fällen von Gingivitis, Paradentitis marginalis superficialis und profunda, und stellte fest, dass die Anzahl Spirochäten bei den normalen Fällen am geringsten war, bei den Fällen von Gingivitis und oberflächlicher Paradentitis grösser, und bei den Fällen von tiefer Paradentitis am grössten. Verf. ist der Ansicht, dass diese Beobachtungen für die Annahme sprechen, dass diese Spirochäten für die infragestehenden Zahnfleischleiden von ätiologischer Bedeutung sind.

Résumé.

L'auteur a déterminé le nombre de Tréponèmes de Vincent existant dans des prélèvements faits aussi bien dans les poches gingivales de personnes à gencives d'apparence normale que dans des cas de gingivites et de paradentoses marginales tant superficielles que profondes, et il a établi que le nombre des spirochètes était le plus bas dans les cas normaux, plus élevé dans ceux de gingivite et de paradentose superficielle, et maximum dans les paradentoses profondes. Il estime que ces constatations viennent à l'appui de l'hypothèse que ces spirochètes jouent un rôle étiologique dans les affections gingivales en question.

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