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CELLULAR ELEMENTS IN GINGIVAL POCKET FLUID

by

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It has been shown that there is a passage of fluid and protein molecules from sub-epithelial compartments into the clinically healthy gingival pocket (*Brill & Krasse* 1958, *Brill & Björn* 1959). The fluid in healthy pockets contains a great number of desquamated epithelial cells and polymorphonuclear leucocytes and a few lymphocytes (*Mendel* 1916, *Sharry & Krasse* 1960, *Löe* 1962).

The passage of fluid may be due to a simple filtration of tissue fluid through the pocket epithelium, or to exudation from an underlying inflammation present even in the healthy gingivae. The occurrence of leucocytes in healthy pockets together with the observation of a round cell infiltration close to the pocket epithelium of healthy gingivae (*Bernier* 1950, *Zachinsky* 1954) suggests that the fluid is of an exudative nature. Findings with regard to the sodium/potassium ratio in the gingival fluid support this suggestion (*Krasse & Egelberg* 1962).

Assuming, thus, that the gingival fluid in healthy pockets is an exudate, it would be of interest to compare the cellular content of this fluid with the cellular content of fluid from chronically inflamed gingival pockets.

MATERIAL AND METHODS

Two groups of persons were studied. The first group consisted of 12 dental nurses aged from 18 to 23 years with no clinical evidence of gingivitis. Pockets from upper premolars and molars

were used for the sampling. The second group was composed of 12 patients of the Dental School aged from 16 to 50 years. Samples were taken from pockets where there was a pronounced chronic gingivitis with calculus and/or soft debris.

After thorough drying of the areas it was sometimes necessary to wait for 10—15 minutes in order to collect sufficient amounts of gingival pocket fluid. A capillary tube was carefully brought into the pocket and moved slightly in a mesial and distal directions 2—4 times. Part of the pocket fluid was in this way drawn up by capillarity. The fluid was blown out into a drop of Ringer solution on a labelled glass slide and mixed by sucking back into the tube twice. Smears were then made as for ordinary blood smears; fixation for at least 15 minutes in a mixture of equal parts of ether and 95 % alcohol and staining according to May Grünvald-Giemsa. Differential counts of the cells were performed where the smears were sufficiently thin and even and the cell morphology stood out clearly. From each person one good smear was selected for the count. 200 cells were counted.

RESULTS

Epithelial cells, polymorphonuclear leucocytes, lymphocytes, and bacteria were observed in the gingival pocket fluid from clinically healthy as well as chronically inflamed gingivae. Most of the epithelial cells had comparatively large nuclei and small amounts of cytoplasm. Some leucocytes were morphologically well preserved and some were disintegrated. Many of them had bacteria inside the cells.

There was an obvious difference between the two groups. Fluid from chronically inflamed gingivae contained many more bacteria and disintegrated leucocytes. Occasional red blood cells were also found in this group.

The distribution of the cellular elements is shown in Tables 1 and 2. The percentage of inflammatory cells increased from 79 in the healthy group to 92 in the inflamed group. A differential count of the inflammatory cells showed about 98 % polymorphonuclear leucocytes and 2 % lymphocytes in both groups.

Table 1

Percentage distribution of epithelial cells and inflammatory cells in gingival pocket fluid.

Group	Number of subjects	Epithelial cells %	Inflammatory cells %
Clinically healthy gingivae	12	21 (5—33)	79 (67—95)
Chronically inflamed gingivae	12	8 (1—19)	92 (81—99)

Table 2

Percentage distribution of polymorphonuclear leucocytes and lymphocytes in gingival pocket fluid.

Group	Number of subjects	Polymorphonuclear leucocytes %	Lymphocytes %
Clinically healthy gingivae	12	98.6 96—100)	1.4 (0—4)
Chronically inflamed gingivae	12	97.5 (95—100)	2.5 (0—5)

DISCUSSION

Gingival pocket fluid from clinically healthy gingivae was found to be similar to fluid from chronically inflamed gingivae with respect to the type of inflammatory cells present. Polymorphonuclear leucocytes and lymphocytes were observed in the relative proportion of 50:1 in both groups.

A difference between the groups was indicated by the relative increase of inflammatory cells compared to epithelial cells from 79 % in the healthy group to 92 % in the inflamed group. The absolute increase might be larger, since an increased shedding of epithelial cells probably occurs in inflamed pockets (*Marwah, Weinman & Meyer* 1960). Another difference was the fact that exudate from inflamed gingivae contained more bacteria and disintegrated leucocytes.

Thus, no difference in principle, but some differences in degree were noted between the cellular content of pocket fluid from healthy gingivae and that from inflamed gingivae. This finding

supports the suggestion made in a previous study (*Krasse & Egelberg* 1962) that the gingival fluid from healthy pockets could be considered an inflammatory exudate and not a simple filtration product.

SUMMARY

The cellular content of gingival pocket fluid from clinically healthy gingivae was compared to that of fluid from chronically inflamed gingivae. The fluid from healthy pockets was found to be similar to that from inflamed pockets with respect to cellular content. This substantiates the suggestion (*Krasse & Egelberg* 1962) that the fluid in healthy pockets may be regarded as an inflammatory exudate.

RÉSUMÉ

ELÉMENTS CELLULAIRES DANS LE LIQUIDE DES CULS-DE-SAC GINGIVO-DENTAIRES

Une comparaison a été faite entre le liquide des culs-de-sac gingivo-dentaires dans des cas où la gencive était cliniquement saine et dans des cas où elle présentait une inflammation chronique. Le liquide provenant de culs-de-sac sains s'est révélé être similaire à celui qui provenait de culs-de-sac enflammés en ce qui concerne le contenu cellulaire, ce qui vient à l'appui de la suggestion (*Krasse & Egelberg* 1962) selon laquelle le liquide des culs-de-sac sains pourrait être considéré comme un exsudat inflammatoire.

ZUSAMMENFASSUNG

ZELLULÄRE ELEMENTE IN DER GEWEBEFLÜSSIGKEIT DER ZAHNFLEISCHTASCHE

Der zelluläre Inhalt der Gewebeflüssigkeit der Zahnfleischtasche der klinisch gesunden Gingiva wurde mit dem zellulären Inhalt der Gewebeflüssigkeit der chronisch inflammierten Gingiva verglichen. Die Flüssigkeit der gesunden Zahnfleischtaschen war, was den Zellinhalt anbelangt, ähnlich der der inflammierten Zahnfleischtaschen.

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