

# Biology of the Orthodontic Patient:

## II. Lingual Vitamin C Test Scores

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### INTRODUCTION

My orthodontic objectives . . . are . . . (1) the best balance and harmony of facial lines, (2) stability of denture after treatment, (3) healthy mouth tissues, and (4) an efficient chewing mechanism. . . . It was observed that all four orthodontic objectives had been attained in only 20 per cent of the cases.

This citation<sup>1</sup> is one among a very select few which attempts to quantitate orthodontic success and failure. It serves as a justification for and prelude to a series of reports regarding biologic aspects of the orthodontic patient.

The first in the series of reports<sup>2</sup> attempted to examine the incidence of vitamin C deficiency in orthodontic patients by means of the plasma ascorbic acid test. Depending upon the definition of physiologic range, the evidence suggested that 17 to 53 per cent of 139 routine orthodontic child patients disclosed suboptimal vitamin C levels.

The purpose of this report is to re-examine vitamin C state in the same study group utilizing a simple and inexpensive lingual vitamin C test.

### METHOD OF INVESTIGATION

One hundred forty-two children from

two orthodontic research projects participated in this experiment. They ranged in age from 110 to 212 months (Table I). The lingual test was performed as previously described.<sup>3</sup> It should be emphasized that the shorter the time required to decolorize the 2:6-dichloroindophenol, the better the vitamin C state. Table II summarizes the findings.

### RESULTS

According to the best available evidence, the physiologic range for the lingual vitamin C test is approximately 15 to 20 seconds. On this basis, approximately 72 per cent of the subjects display suboptimal vitamin C state.

### DISCUSSION

The importance of vitamin C in bone metabolism is well established. The need for optimal bone response during and after orthodontic therapy is evident. It is, therefore, of interest that approximately 7 out of 10 orthodontic subjects show vitamin C scores which are marginal or poor. This becomes of even greater interest in the light of the introductory quotation indicating that ortho-

TABLE I  
AGE FREQUENCY DISTRIBUTION

Age Groups (months)	Number and Percentage of Subjects		
	Project One	Project Two	Total
100-119	15 [ 16.7% ]	1 [ 1.9% ]	16 [ 11.3% ]
120-139	22 [ 24.4% ]	6 [ 11.5% ]	28 [ 19.7% ]
140-159	23 [ 25.6% ]	14 [ 26.9% ]	37 [ 26.1% ]
160-179	25 [ 27.8% ]	13 [ 25.0% ]	38 [ 26.8% ]
180+	5 [ 5.7% ]	18 [ 34.6% ]	23 [ 16.2% ]
total	90 [100.0%]*	52 [100.0%]*	142 [100.0%]*

\* approximate

TABLE II  
LINGUAL VITAMIN C TEST SCORES DISTRIBUTION

Lingual Vitamin C Scores (seconds)	Number and Percentage of Subjects		
	Project One	Project Two	Total
10-14	4 [ 4.5% ]	1 [ 2.0% ]	5 [ 3.6% ]
15-19	28 [ 31.8% ]	6 [ 11.8% ]	34 [ 24.5% ]
20-24	15 [ 17.0% ]	10 [ 19.6% ]	25 [ 18.0% ]
25-29	18 [ 20.5% ]	14 [ 27.5% ]	32 [ 23.0% ]
30-34	8 [ 9.1% ]	7 [ 13.7% ]	15 [ 10.8% ]
35-39	8 [ 9.1% ]	4 [ 7.8% ]	12 [ 9.8% ]
40-44	5 [ 5.7% ]	2 [ 3.9% ]	7 [ 5.0% ]
45-49	2 [ 2.3% ]	0 [ 0.0% ]	2 [ 1.4% ]
50-60	0 [ 0.0% ]	7 [ 13.7% ]	7 [ 5.0% ]
total	88 [100.0% ]	51 [100.0% ]	139 [100.0% ]*

\* approximate

dontic success may well be in the area of 20 per cent. However, the ultimate significance of the observation reported here must await more study of orthodontic results in the light of vitamin C state.

#### SUMMARY AND CONCLUSIONS

A study of ascorbic acid state (as measured by lingual vitamin C test technique) in 139 routine orthodontic patients discloses suboptimal vitamin C levels in approximately 72 per cent.

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#### REFERENCES

1. Tweed, C. H. Was the development of the diagnostic facial triangle as an accurate analysis based on fact or fancy? *Amer. J. Orthodont.*, 48:823, November 1962.
2. Cheraskin, E. and Ringsdorf, W. M., Jr. Biology of the orthodontic patient: I. Plasma ascorbic acid levels. *Angle Orthodont.*, 39:137, April 1969.
3. Cheraskin, E., Ringsdorf, W. M., Jr. and El-Ashiry, G. A lingual vitamin C test. *Int. J. Vit. Res.*, 34:31, 1964.