

A Rapid and Simple Lingual Ascorbic Acid Test

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THERE is general agreement that *classical* scurvy is now rare. However, in the opinion of some authorities, *marginal* vitamin C deficiency states are not infrequent. Unfortunately, these subtle problems cannot be detected by clinical examination. The present blood and urine tests for vitamin C status are cumbersome, expensive and difficult to obtain. Thus, a simple tool to detect the marginally deficient vitamin C patient is needed. This report outlines a simple procedure that involves timing the decolorization of a minim of dye deposited on the dorsum of the dried tongue.

As far as we can determine, only one attempt

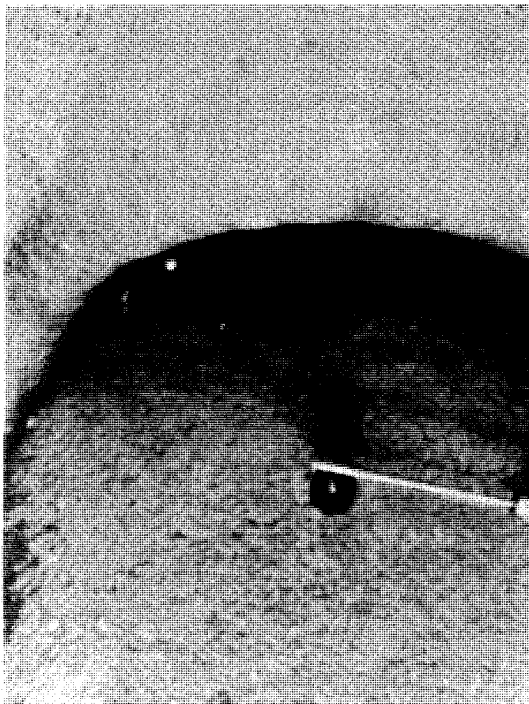


FIGURE 1A. Deposition of one minim of N/300 2:6 dichlorophenolindophenol solution.

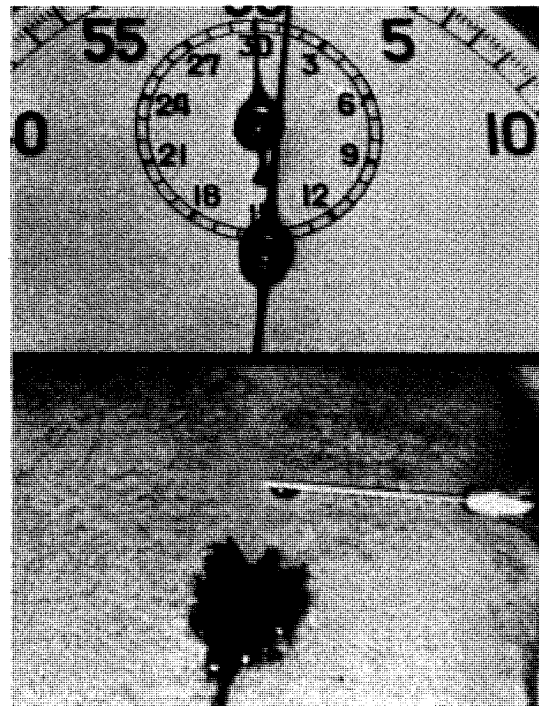


FIGURE 1B. The dye begins to disappear at two seconds.

of this type has been reported. Giza and Weclawowicz studied children, adults and guinea pigs. They deposited one minim of a 0.06 per cent solution of dichlorophenolindophenol on the dried dorsal surface of the protruded tongue. In their opinion, the results compared favorably with blood vitamin C levels and urinary ascorbic acid excretion.

Technique

We studied 100 white adult males and females. All determinations were performed postprandially. One minim of a N/300 2:6 dichlorophenol-

indophenol solution was deposited through a 25-gauge needle on the dried dorsum of the protruded tongue. The number of seconds required for decolorization was determined by a stop watch (*Figure 1*).

Immediately upon completion of the procedure, the test was repeated to establish its reproducibility. In only one instance was the second test shorter than the first and then only by one second. The largest group of second tests (32 per cent) differed from the first test by three seconds. Practically all of the differences (98 per cent) were less than eight seconds.

At each visit the plasma ascorbic acid level was

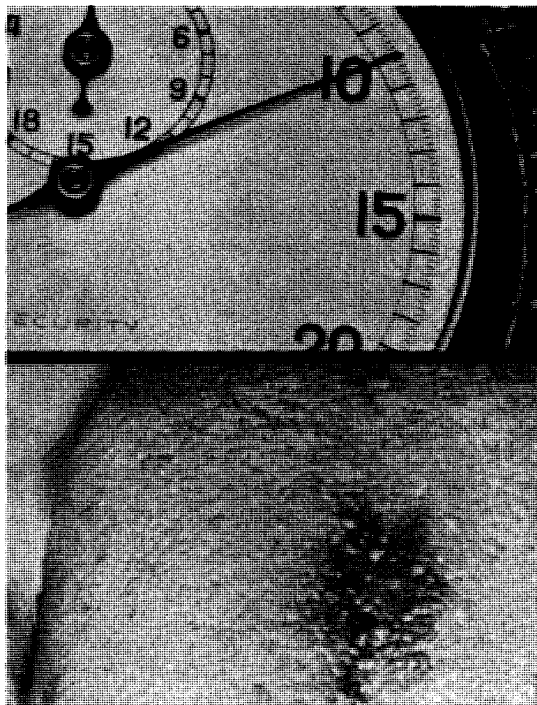


FIGURE 1C. At 10 seconds, the dye is rapidly being decolorized.

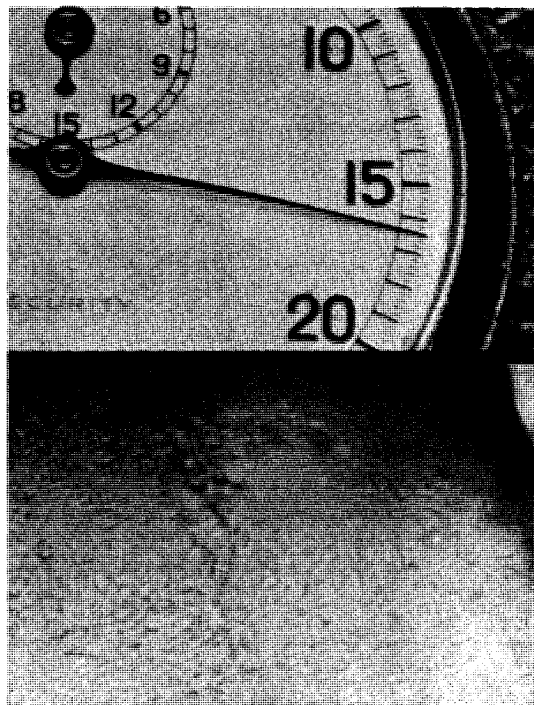


FIGURE 1D. At 16.5 seconds, the dye solution has completely vanished.

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also determined. Also, at each session, the *intra-dermal* ascorbic acid decolorization test time was measured. In this manner, the study permitted an evaluation and comparison of the lingual time versus the plasma ascorbic acid level and the lingual time versus the intradermal time in 75 subjects.

Results

Figure 2 describes the relationship of the plasma ascorbic acid to the first lingual test. The groups of lingual scores are shown on the abscissa. The mean plasma ascorbic acid values are depicted on the ordinate. This shows quite clearly a progressive decline in mean plasma ascorbic acid with an increase in lingual time. The number of subjects is shown at each point in parentheses. The highest plasma ascorbic acid values are associated with the shortest lingual test times.

Figure 3 summarizes the relationship of the

intra-dermal time (in minutes) to the first lingual test (in seconds). The lingual time group values are shown on the abscissa. The mean intradermal test time scores are plotted on the ordinate. Also included at each point, in parentheses, is the number of subjects. This figure quite definitely demonstrates a progressive increase in mean intradermal time in parallel with an increase in lingual time.

It appears, within the limits of this study, that the lingual time measures whatever is being measured by the plasma ascorbic acid level and the intradermal time. Furthermore, this procedure is carried out in seconds, as contrasted with minutes for the intradermal time and hours for the plasma level.

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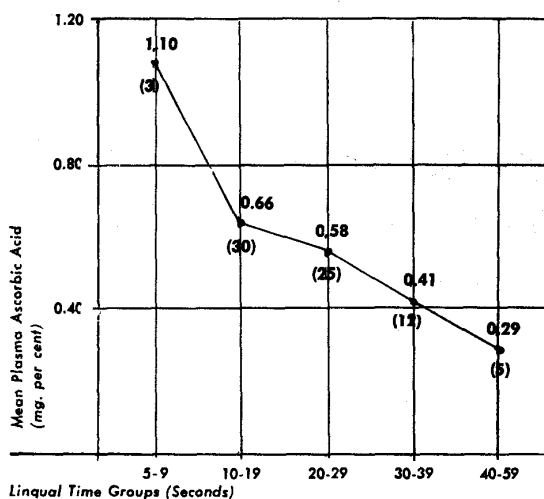


FIGURE 2. Relationship of lingual scores to plasma ascorbic acid level.

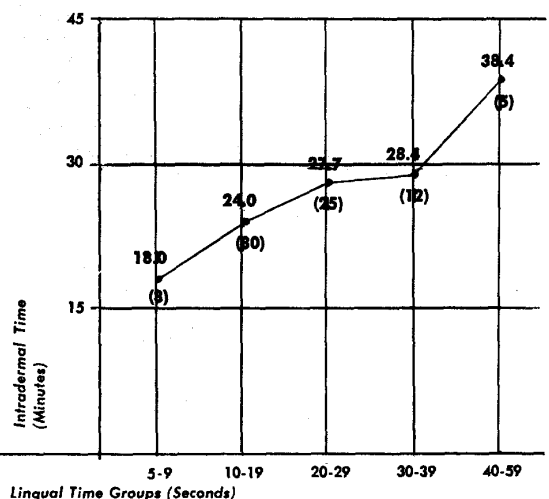


FIGURE 3. Relationship of lingual time and intradermal time.