

LETTER TO THE EDITOR

ASSESSMENT OF ASCORBIC ACID STATUS AS REVEALED BY LINGUAL TEST

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Sir,

Deficiency of ascorbic acid can interfere with normal body functions such as formation of connective tissue (1), healing of infections (7), haemopoiesis (2) and can also promote haemorrhage from the gastrointestinal tract (8). Hence, it is essential to find out the frequency distribution of such deficiency among Indians. In 1960, Giza and Weclawcicz (5), developed a simple screening test (lingual ascorbic acid test - LAAT) for assessing ascorbic acid deficiency. With the help of this simple screening test (LAAT), we undertook a survey to find out the ascorbic acid status and frequency distribution of the LAAT time in healthy subjects, belonging to different age groups.

We have carried out our study on 303 healthy subjects. They consisted of 193 school children (boys 107 and girls 86), between the age group 5-19 years, 76 medical students (male 61 and female 15) in the age group of 16-27 years and 34 staff members (male 30 and female 4) ranging from 20-42 years.

The principle of the lingual ascorbic acid test is that the blue colour solution of dichlorophenol indophenol (DCIP) is decolourised by ascorbic acid. The test was performed as described by Kien and McDermott (6) between 1-2 hr after food intake in all the volunteers. Based on correlation studies (3,6) on plasma ascorbic acid level, subjects with test time over 120 seconds were considered as having low ascorbic acid level, and those with test time less than 60 seconds were accepted as having high level. Subjects with values between 60 to 120 seconds were considered to have normal ascorbic acid level. Results were classified according to sex and age and the possibility of significant difference in ascorbic acid status was examined by student's 't' test.

The results of lingual ascorbic acid test time (LAATT) is given in Table I. The mean LAATT is slightly lower in females as compared to males, however, it was not statistically

significant. Analysis of frequency distribution of different ranges of LAATT suggested that the maximum number of subjects were having the test time between 11 and 30 seconds. On the whole, 81.2% of our subjects were having LAATT below 60 seconds, 3.6% between 60-120 seconds and 15.2% above 120 seconds.

Since 81.2% of these subjects had a LAATT below 60 seconds, the same group was analysed further (Table II). For a total number of 246 subjects in this series, the mean LAATT value is 24.9 ± 0.76 sec. Further analysis of these subjects, based on age distribution (Table II), failed to show any significant difference, in LAATT value in them. Their mean LAATT was slightly lower than that of the overall mean LAATT (24.9 ± 0.76 and 41.6 ± 2.13 sec respectively). As can be seen in Table II, there is a slightly higher value

TABLE I : Lingual ascorbic acid test time (LAATT) of healthy subjects.

<i>Subjects</i>	<i>Sex</i>	<i>Time (sec)</i> <i>Mean \pm S.E.</i>
303	Both sexes	41.6 ± 2.13
198	Male	43.8 ± 2.65
105	Female	37.2 ± 3.62

TABLE II : Breakup figures of subjects with LAATT below 60 seconds.

<i>Group</i>	<i>Number</i>	<i>LAATT (sec)</i> <i>Mean \pm S.E.</i>	<i>Sex</i>	<i>LAATT (sec)</i> <i>Mean \pm S.E.</i>
whole	246	24.9 ± 0.76	M (159)	26.3 ± 0.99
			F (87)	21.7 ± 7.07
<10 years	113	21.8 ± 1.13	M (59)	23.4 ± 1.79
			F (54)	20.0 ± 1.32
11-20 years	83	29.7 ± 1.50	M (56)	31.2 ± 1.72
			F (27)	26.6 ± 2.04
21-30 years	44	24.3 ± 1.24	M (38)	26.6 ± 1.27
			F (6)	15.8 ± 2.29
31-42 years	6	21.5 ± 2.92	All Male	—

M = Male,

F = Female

in the age group of 11-20 years with a tendency to show lower values in low as well as in higher age groups.

With the help of Lingual Ascorbic acid test, we have been able to find out the frequency distribution of LAATT in our subjects. In one series consisting of 31 subjects

reported by Kien and McDermott (6), the mean LAATT was 26.5 seconds (range 12 to 51.1 sec). Compared to their report, our series had a higher mean LAATT. This was because of the fact that all their subjects had value below 60 seconds whereas 15.2% of our subjects had a value above 120 seconds and 3.6% between 60-120 seconds. In concurrence with their report we failed to find any significant difference in the ascorbic acid levels of men as compared with women. However, our report differs from that of Dodds (4), who reported low ascorbic acid levels in men compared with women.

The LAAT showed significant correlation with plasma ascorbic acid level (3,6). Estimation of plasma ascorbic acid is only a measurement of the immediate nutritive or metabolic level and is dependent on the recent dietary level. It merely reflects an overflow and does not reflect the tissue stores (1). Hence, LAATT may be used only for the screening purpose. For the precise management of patients with LAATT more than 120 seconds, the degree of ascorbic acid deficiency must be investigated by leucocyte ascorbic acid estimation or by the plasma ascorbic acid saturation test

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