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ASCORBIC ACID AND THE COMMON COLD

An important contribution to the body of evidence about the effectiveness of ascorbic acid (vitamin C) in controlling the common cold has been made by Drs Hume and Weyers on page 3 of this issue of the *Scottish Medical Journal* in their paper [4]Changes in leucocyte ascorbic acid during the common cold'. It has long been recognised that an ascorbic-acid content in leucocytes of 20 *ug.* or more per 10^8 cells is needed for proper phagocytic activity, and that the amount of ascorbic acid is decreased by an infection such as a common cold. Hume and Weyers have shown in their careful study of 7 subjects with ordinary nutrition that the mean ascorbic-acid content decreases from 20 before the cold to 10 on the first and second days of illness, and then increases slowly. With subjects receiving 1 g. of ascorbic acid per day the average pre-cold value was 30 *ug.* per 10^8 cells. On contracting colds the subjects were given 6 g. of ascorbic acid per day for 3 days, and then 1 g. per day. The leucocyte ascorbic-acid content fell to a minimum of 23.9 on the third day, and then rose to the original value. The concentration of ascorbic acid in the serum was found to increase from 0.8 mg. per deciliter for no supplementary ascorbic acid to 1.7 for 1 or 3 g. per day and to 2.4 for 6 or 10 g. per day.

This study leaves little doubt that an increased intake of ascorbic acid provides added protection against bacterial infections by increasing the phagocytie activity of leucocytes. There is, moreover, a considerable body of evidence supporting the thesis that it provides added protection also against viral infections. Reports of *in vitro* deactivation of and *in vivo* protection against several viruses have been published during the last 35 years.

The earlier work on ascorbic acid and the common cold was summarised by me in my book *Vitamin C and the Common Cold* (1970). I pointed out that several good studies had been made, and that every study in which comparison was made of ascorbic acid or a placebo taken regularly over a period of time by subjects exposed to colds in the ordinary way (by contact with other people) had yielded a positive result; that is, the ascorbic-acid subjects had fewer colds than the placebo subjects. Some of the studies yielded results with high statistical significance. An example is the double-blind study of Ritzel (1961), a physician with the city schools of Basel. His subjects were 279 schoolboys, 15 to 17 years old, who were observed for 5 or 7 days in ski camps in the mountains. They received 1 g. of ascorbic acid per day or a placebo. The incidence of colds was 45 per cent less for the ascorbic-acid subjects than for the placebo subjects, and the amount of illness per subject was 63 per cent less. These results were statistically significant at the 99.9 per cent level of confidence.

During 1972 two groups of investigators have reported the results of similar studies. In each case a protective effect was observed. Charleston and Clegg in Glasgow carried out a study with 90 subjects during a period of 16 weeks. The subjects received 1 g. of ascorbic acid per day, or a placebo. The incidence of colds was 49 per cent less for the ascorbic-acid subjects than for the placebo subjects, and the amount of illness per subject was 58 per cent less, in good agreement with Ritzel's results. A somewhat smaller protective effect was reported by Anderson *et al.* in Toronto. They gave 1 g. of ascorbic acid per day (plus 3 g. per day for 3 days when a cold began) to 818 subjects, who were observed for 2 to 4 months. The incidence of colds was 7 per cent less for the ascorbic-acid subjects than for the placebo subjects, and the amount of illness per subject was 30 per cent less. Each of these

1972 studies gave statistically significant results, rejection of the null hypothesis of equal effectiveness of ascorbic acid and placebo at greater than 99.8 per cent level of confidence.

Charleston and Clegg state that their results are 'so clear cut in favour of vitamin C as a positive agent in reducing the incidence and duration of the common cold when ingested in higher amounts than could be achieved on a normal dietary regimen or with low supplementation, that we suggest further investigations are needed'. Anderson *et al* and Hume and Weyers make similar statements. It is my opinion that the evidence already available shows with almost complete certainty that ascorbic acid provides some degree of protection against the common cold. Further studies are needed to determine the best prophylatic and therapeutic treatment for most people. My recommendation (following Irwin Stone) of regular ingestion by most people of 1 or 2 g. per day (even 5 g. or more per day for some) and of 4 to 10 g. per day, or even more, for a few days beginning at the first sign of a cold may turn out to be about right, or may require modification. A single injection of a few grams of sodium ascorbate in the early hours of a respiratory infection might modify its course greatly. Moreover, as was mentioned by Anderson *et al.* and has been discussed by many investigators, ascorbic acid seems to have value in preventing or ameliorating many other diseases. A thorough study of the possible uses of this important substance should now be made.

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