Libyan International Medical University
Faculty of Basic Medical Science

the Role of Vitamin C in the Treatment and Prevention of Common Cold

Submitted by: Arwa Alsalmi M. Almslati
Supervisor: Dr. Mohammed Bendardaf
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Abstract:
A lot of studies have been done since the isolation of L-ascorbic acid, in different approaches as cancer, cardiovascular disease, and cataract. Although most of the studies followed a scientific ways to determine if there's a relation between the recover from common cold and vitamin C, most of the time the opinions were contradicted. This debate could lead us to new approaches if the researches in this field continue.
Since small amount of ascorbic acid prevent scurvy about 10mg per day, the research in this field started with small intake up to 200 mg/day which considered a huge number compered with the needed amount to prevent scurvy; this led most of the scientists to relatively false conclusions. On the other hand, using large amount up to 3mg per day found of good value in enhance the immune system to prevent diseases, while other studies also used a large amount of ascorbic acid found it of a little benefit if any in treating common cold and most of the benefit were due to Psychological factors; as the participants thought they were taken the real pills. Another point to look at is that there would be better absorption with 250 mg as supplements taken four times daily than 1,000 mg taken once daily; this may resolve the debate. Taking high doses in proper way may treat common cold and other diseases by the mean of powering the natural protective mechanisms of the body.

Introduction:
Vitamin C:

- L-ascorbic acid, is a water-soluble vitamin that is naturally present in some foods, and available as a dietary supplement.
- Humans, unlike most animals, are unable to synthesize vitamin C endogenously, so it is an essential dietary component.
- Required for the biosynthesis of collagen, L-carnitine, and certain neurotransmitters; vitamin C is also involved in protein metabolism
- An important physiological antioxidant and has been shown to regenerate other antioxidants within the body, including alpha-tocopherol (vitamin E)
- Plays an important role in immune function and improves the absorption of nonheme iron, the form of iron present in plant-based foods.
- Insufficient vitamin C intake causes scurvy
- Approximately 70%–90% of vitamin C is absorbed at moderate intakes of 30–180 mg/day. However, at doses above 1 g/day, absorption falls to less than 50% and absorbed, unmetabolized ascorbic acid is excreted in the urine.
- High levels of vitamin C (millimolar concentrations) are highest in leukocytes, eyes, adrenal glands, pituitary gland, and brain.[1]
- The recommended dietary allowance (RDA) for vitamin C for adult non-smoking men and women is 60 mg/d, which is based on a mean requirement of 46 mg/d to prevent the deficiency disease scurvy. Conversely, recent scientific evidence indicates that an increased intake of vitamin C is associated with a reduced risk of chronic diseases such as cancer, cardiovascular disease, and cataract, probably through antioxidant mechanisms.[2]

Common cold:

- Is a viral infection of the upper respiratory tract
- Usually harmless.
- Children younger than six are at greatest risk of colds, but healthy adults can also expect to have two or three colds annually.
- Most people recover from a common cold in a week or 10 days. Symptoms might last longer in people who smoke.

This study aims to determine the role of vitamin C in both prevention and treatment of common cold.

Discussion:
A common belief that ascorbic acid has a good value in treating and protection against common cold, which was contradicted by most of scientists and physicians.[3]
After few years of identifying vitamin C as ascorbic studies on the relation between common cold and vitamin C began.
In 1938 dr. roger kobsch of St.Elisabeth hospital; had published a report indicate that oral doses up to 1 g per day were of value against rhinorrhea, acute rhinitis and secondary rhinitis and accompanying manifestation of

illness, such as headache. He then found that the injection of 250 or 500 mg of ascorbic acid on the first day of a common cold almost always led to the immediate disappearance of all the signs and symptoms of the cold, with similar injection sometimes needed on the second day. He stated that ascorbic acid is far superior to other cold medicines, such as aminopyrine, and is without danger, even with large doses.[4]
The Common Cold Research Unit study in 1967, which concluded that 3 g daily was ineffective in curing colds that Linus Pauling criticized them, his point of view was that the ascorbic acid was stopped three days after the cold appeared; because enzymes are induced by high doses of ascorbic acid, stopping the vitamin will make an ordinary dietary intake give only very low plasma levels, and hence lower resistance to the cold causing it to become worse. [5]

In 1942 Glazebrook and Thomson reported the results of study carried out in an institution where there were about 1500 students aged 15-20 years. 1,100 were controls and their total intake of ascorbic acid was only 5 mg to 15 mg; and 335 were given 200mg per day, for six months. The incidence of colds and tonsillitis was 30.1 percent and 23 percent developed moderately sever colds or tonsillitis among students given ascorbic acid. Whereas, The incidence of colds and tonsillitis was 34.5 percent and 30.5 percent developed moderately sever colds or tonsillitis among the control. What's more the average number of days of hospitalization because of infection was lower among ascorbic group about 2.5 days and 5 days for the controls. This research gives us a small perspective about the benefit of the vitamin, which could be a wealth if proved.

In 1961the first carefully controlled study with a larger daily amount, 1000 mg, of ascorbic acid were reported by Dr. G. Ritzel. The study was carried out in a ski resort with 279 boys aged 15 to 17 during 2 periods of 5 to 7 days that the incidence of colds during these short periods was large enough- 20%- the investigation was blind, with neither the participants nor the physicians knew the distribution of the ascorbic acid tablets and the placebo tablets- inactive. This study shows the incidence of common cold decreased about 45% among the vitamin group and the average number of days per cold for the ascorbic acid group was 1.82, about 29% less than the value for the placebo group, 2.58. Compared with another study in 1974 with quite different condition, involved 112 soldiers undergoing operational training. Half of them received 1g of ascorbic acid per day for 4 weeks, and the other half received placebo. The average number of days per cold for the ascorbic acid group was 68% lesser than placebo subjects; that indicate large amount of vitamin C is of a great benefit especially for those working in jobs that need efforts.[4]

Some journal refused published these reports because they would be harmful for the journal to loss their advertisers over 25% of the advertisements related to patented drugs for the alleviation of cold symptoms or for the treatment of complications of colds, while other journals assumed that the researches weren't correct.[5]

In 1955 Ericsson and Lundbeck; and Miller in1969 suggested that the mechanisms of inactivation of viruses and bacteria are similar: attack by free radicals formed by ascorbate and molecular oxygen, catalyzed by copper ion. In 1986, Professor A. Stewart Truswell had summarized the results of 27 trials conducted since 1970. Five were treatment trials with vitamin C or a placebo given only at the onset of a cold and for only several days and all of which found no benefit. The other 22 were double-blind controlled trials giving daily vitamin C or placebo before and during colds. Of these, 12 trials showed no prevention and no reduction in duration or severity, five trials showed no prevention and only slight, statistically nonsignificant lessening of severity, and the other five trials reported no prevention and a small but significant in reduction of duration of the colds. Dr. Truswell concluded: "It is now fairly clear that for preventing colds, vitamin C has no worthwhile effect," but he believed that: "There is thus a little more evidence for a small therapeutic effect of ascorbic acid (vitamin C). However, as Dr. T.W. Anderson's second trial in 1974 revealed 250 mg of vitamin per day reduced severity as much as did 1,000 mg or 4, 000 mg. these result make the judge on the benefits of vitamin C much more confused.[6]

Study was reported in 1975 by scientists at the National Institutes of Health who compared vitamin C pills with a placebo before and during colds. The experiment was supposed to be double blind, but half the subjects were able to guess which pill they were getting. When the results were tabulated, the vitamin group reported fewer colds per person over a nine-month period. On the other hand, the half who hadn't guessed which pill they had been taking, there were no difference in the incidence or severity was found. This indicate that when you think something is effective it will reflect a good results even they are not exists.[7]

As the recommended daily allowance (RDA) still the same until this day I think the world health institute didn't find the researches that had been done to support the benefit of vitamin C accurate enough and much research should have be done to prove it. Nowadays, science has been developed hugely, which may give us a precise result about the role of the vitamin C in the treatment of common cold. Through out studying of all these reports I have found that the theory of Pauling, Linus could be true at the onset of common cold, when the body produces large amount of leukocytes, which need vitamin C as a major component to do their phagocytic function and improve relieve of symptoms.

Conclusions:

My conclusion is that a proper intake of vitamin C at the onset of cold; decreases the incidence and severity of the common cold and could be a helpful treatment; as it has less toxic effect than other cold medications.

Recommendation:

New researches should be done in this field since the immunity is a major challenge in this era, if the benefit of vitamin C proved this would be a very important shift in the lives of humans

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