Vitamin C scarcity in India – reasons and impact

Vitamin C (ascorbic acid) is used in the treatment of common cold, allergies and respiratory disorders. It is also helpful in healing wounds. It has antioxidant activity and prevents the cell membrane of vital organs from getting damaged due to oxidation. Vitamin C deficiency can lead to scurvy[1,2] in which there is lack of synthesis of collagen in the human body resulting in bleeding disorders, malformation of bones and growth retardation. The supplement is essential for cartilage health. Though vitamin C is a small-product category with annual sales of less than Rs 100 crore, it is a key ingredient of the Rs 1500 crore multivitamin market[3]. But people depending on this supplement are facing a tough time nowadays due to an acute shortage of vitamin C in the pharmacies and medical stores throughout India since the last four months. Stocks of popular vitamin C tablets are not available in the market[2,4]. Even government hospitals and institutions are devoid of vitamin C supplies. Vitamin C medicines were easily available to the consumer at an affordable price of about Rs 7 per strip of ten tablets[5], but in the present scenario the product has not been obtainable for several months.

We tried to find out the reasons behind this scarcity. We learned that the major ingredient (2-keto-L-gulonic acid) which is required for manufacturing vitamin C is entirely imported from China. A steep increase in its prices has been observed following anti-pollution measures in China during the preparation for the Olympics, because the fermentation process used to make this ingredient is highly corrosive and polluting. Factories in China making this bulk material were asked to cut production in a prelude to the Olympics due to environmental reasons[3], which caused the price of the key intermediate to shoot up from US$ 3 to US$ 12 per kg. As a result, vitamin C prices in India increased from Rs 400 to Rs 2500 per kg. With the Government's Drug Price Control Order keeping the limit price at Rs 366 per kg, it has become difficult for large formulation manufacturers to buy the ingredient. In the last two years, the National Pharmaceutical Pricing Authority, a government body, has slashed the price of vitamin C twice following reduction in customs duty. Though the price of the input ingredient is softening a little, it is still high. Industry experts blame the government for not revising the prices of vitamin C drugs in keeping with the rise in input costs. Since around 60% of the raw material used in manufacturing the vitamin is imported, it is not possible for indigenous manufacturers to produce vitamin C and sell it at prices laid down by the government.

With the drug in short supply, one option available with the consumer is to shift to natural sources of vitamin C like lemon, orange, gooseberry (amla), tomatoes, strawberries[1,2] and other citreous fruits, but in case of those who are suffering from vitamin C deficiency, it is important that there should be no missing of dosage. Natural body-builders need at least 1–1.5 g of the vitamin spread over equal doses throughout the day to ensure that the stress hormone, cortisol, does not affect the muscles and health. They cannot depend on citreous fruits alone. Moreover, the above option of relying on natural sources is not a permanent solution. We need to come out fast with a commercially viable technology for vitamin C production, thereby to end the Chinese monopoly. The Indian industry depends on China for the active pharmaceutical ingredient of many drugs. About 9% of the bulk drugs produced in China is exported to India. The old method of vitamin C production involves steps using environmentally hazardous chemicals and steps requiring high energy consumption[6]. There is multiple research work going on across the world to develop some alternate methods for vitamin C production. Innovative research has been carried out by the Scottish Crop Research Institute, the US-based Genentech Inc and even at CSIR laboratories in India. While in one US patent, the microbial production of vitamin C from substrates like D-sorbitol and L-sorbose has been discussed[7], another US patent describes an enzymatic process for its manufacture[8].

The need of the hour is an environment-friendly, single-step process for the production of vitamin C which is economically and commercially viable, to be used by the formulation manufacturers in India, and which can provide an uninterrupted supply of vitamin C supplements to the Indian consumers at an affordable cost. This is one area which requires focus from all the government as well as non-government research laboratories, organizations and institutions, so as to bring an end to the dependence on Chinese suppliers for such an essential nutrient.

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