

**A RARE CASE OF HYPERCAROTENEMIA**

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**INTRODUCTION**

Carotenemia is a clinical condition characterised by yellow pigmentation of skin (xanthoderma) and increased carotenoid levels in blood. In most cases the condition follows prolonged and excessive ingestion of carotene rich foods like carrots, squash, sweet potatoes, pappya etc. Most frequently seen in infants and children and vegetarian diet. Also can be seen if metabolism of beta carotene is decreased as in diabetes, hyothyroidism, nephrotic syndrome and liver disease. The condition of carotenemia is harmless, but it can lead to a mistaken diagnosis of jaundice.

**CASE REPORT**

A 69 year old male, a retired bank officer comes with a history of yellowish discolouration of his body more so over the palms and soles. There is no history of yellowish discolouration of eyes or high coloured urine. He is a non alcoholic and non smoker. Vegetarian by

diet. A known diabetic on oral hypoglycemics and sugars well under control. Otherwise asymptomatic. No history of fever, pain abdomen, itching. On probing, gives history of consumption of around 1 kg of papaya per day from past 10 years.

**On examination**

Vitals stable, afebrile



Examination showed yellowish discoloration of skin but no conjunctival icterus. All biochemical tests done including CBC, LFT, RFT, Thyroid function tests were within normal limits.

Diabetic status was under adequate control with FBS:96, PPBS: 113, HbA1C: 5.5

## DISCUSSION

Carotenoids are pigments of plant origin and are responsible for the yellow and orange color of fruits and vegetables. Carotenoids act as antioxidants, affect cell growth regulation, and modulate gene expression and immune response. Animals are incapable of synthesizing carotenoids.<sup>[1]</sup>

Carotenes are the hydrocarbon component of carotenoids. Carotene derived from plant foods is the primary source of dietary vitamin A (retinol). Ingested carotenes, enclosed as crystals or amorphous solids within vegetable cells, are converted to vitamin A in the mucosal cells of the small intestine.<sup>[1]</sup>

Approximately 10% of ingested carotene is absorbed unchanged and is carried directly to the liver by portal circulation.<sup>[2]</sup> Factors influencing the absorption of carotene include the fiber content of the plant and the particulate size of the food. Pancreatic lipase, bile acids, fat, and, possibly, thyroid hormone aid in the absorption of carotene.<sup>[2]</sup>

Carotene is excreted through the colon and epidermis. In the latter area, the horny layer of skin reabsorbs carotene if excretion is unusually heavy.<sup>[3]</sup> In fact, carotenoids accumulate in the epidermis about 2 weeks after serum levels achieve equilibrium, and maximum accumulation occurs in areas with an abundance of sweat glands, such as the nasolabial folds, palms, and soles.<sup>[4]</sup>

Excessive ingestion of carotenoids is nontoxic. Although in dietary carotenemia, elevated serum carotene often is accompanied by a corresponding elevation in serum vitamin A levels, hypervitaminosis A is not observed, presumably because the conversion of carotenoids to vitamin A is regulated.<sup>[5]</sup> In other causes of carotenemia, serum vitamin A levels are within reference ranges or low.<sup>[6]</sup> The conversion of beta-carotene (provitamin A) to vitamin A is accelerated by thyroxine and hyperthyroidism.<sup>[7]</sup>

### Disorders associated with the development of carotenemia also include the following

- Liver disease - Primary hepatic injury may prevent the conversion of carotene to vitamin A<sup>[8]</sup>
- Kidney disease - Serum carotene levels may be markedly elevated in patients with chronic glomerulonephritis and nephrotic syndrome<sup>[9]</sup>
- Inborn errors of metabolism - Carotenemia may result from a failure to convert carotene into vitamin A due to an inborn error of metabolism<sup>[10]</sup>

### • Familial conditions<sup>[7]</sup>

With elimination of the intake of carotene-rich foods, serum carotene levels drop sharply within a week and the yellow discoloration of the skin gradually disappears over several weeks to months. Medications are not indicated for the treatment of diet-induced carotenemia.<sup>[11-17]</sup>

## CONCLUSION

Hypercarotenemia is a benign condition due to excessive consumption of diet rich in carotenoids. It can be mistaken for the diagnosis of jaundice. Various secondary causes must be ruled out before confirming dietary hypercarotenemia as it is a benign and reversible condition.

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