

Case report

Lady with yellow palm

Vivek Pant^{a,*}, Suman Baral^b^a Department of Biochemistry, Samyak Diagnostic Pvt Ltd, Kathmandu, Nepal^b Medicit Hospital, Kathmandu, Nepal

ARTICLE INFO

Article history:

Received 26 January 2020

Accepted 15 February 2020

Keywords:

Carotenemia
Hypothyroidism
Carotenoids rich foods
Yellow skin

Palabras clave:

Carotenemia
Hipotiroidismo
Comidas ricas en carotenoides
Piel amarilla

ABSTRACT

Hypercarotenaemia develops in person consuming high amount of carotenoid rich foods. It is also known that person with hypothyroidism and diabetes mellitus tend to develop hypercarotenaemia with the normal intake of carotenoid rich foods. This case is of hypercarotenaemia in adult Nepalese hypothyroid women who consumed excess amount of food rich in carotene in order to get rid of her jaundice. Our common food habits can cause ill health effects if not monitored.

© 2020 The Author(s). Published by Elsevier España, S.L.U. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

La dama con la palma amarilla

RESUMEN

La hipercarotinemia se desarrolla en personas que consumen cantidades elevadas de comidas ricas en carotenoides. También es conocido que las personas con hipotiroidismo y diabetes mellitus tienden a desarrollar hipercarotinemia con el consumo normal de comidas ricas en carotenoides. En este caso se presenta hipercarotinemia en una mujer adulta nepalesa que tiene hipotiroidismo y que consumía una cantidad excesiva de comida rica en carotenos para poder sanar su ictericia. Nuestros hábitos alimenticios comunes pueden causar mala salud si no son monitoreados.

© 2020 El Autor(s). Publicado por Elsevier España, S.L.U. Este es un artículo Open Access bajo la licencia CC BY-NC-ND (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Context

Hypercarotenaemia is a benign condition caused by deposition of carotenoids in the skin. Beta carotene level in serum is increased and can be measured in clinical laboratory for the diagnosis of hypercarotenaemia. Sclera and buccal mucosa is spared in carotenemia since adipose tissue is the main target of carotenoids. Stratum corneum layer of skin has high lipid content thus having affinity for carotene. Mucosal layer lacks this affinity; thus yellow skin is most prominently seen on the thick areas of the skin, such as the palms and soles.¹ Carotenemia is a benign condition, because the conversion of carotene to vitamin A is very slow.² Green, yellow and orange fruits and vegetables such as carrots, oranges, sweet potatoes, squash, and pumpkins contain carotene. Excessive

intake of these carotene-rich foods or other nutritional supplements containing carotene can lead to carotenemia.³ Carotenoids are absorbed and cleaved by the intestinal mucosal enzyme into two molecules of retinal.⁴ We report a case of hypercarotenaemia in a hypothyroid female.

Case report

A 46-year-old woman presented in endocrinology with history of yellowing of skin on her palms for 2 years. She had been consulting for this condition with other clinicians for one year. She is a known case of hypothyroidism and hypertension for which she is taking regular medicine. She did not consume alcohol, and had no personal or family history of liver disease.

Physical examination revealed yellow pigmentation of her palms (Fig. 1). Scleral icterus was absent. Systemic examination was normal. Results of laboratory tests for aspartate aminotransferase, alanine aminotransferase, hemoglobinA1c, total and direct

* Corresponding author.

E-mail address: drv pant@gmail.com (V. Pant).

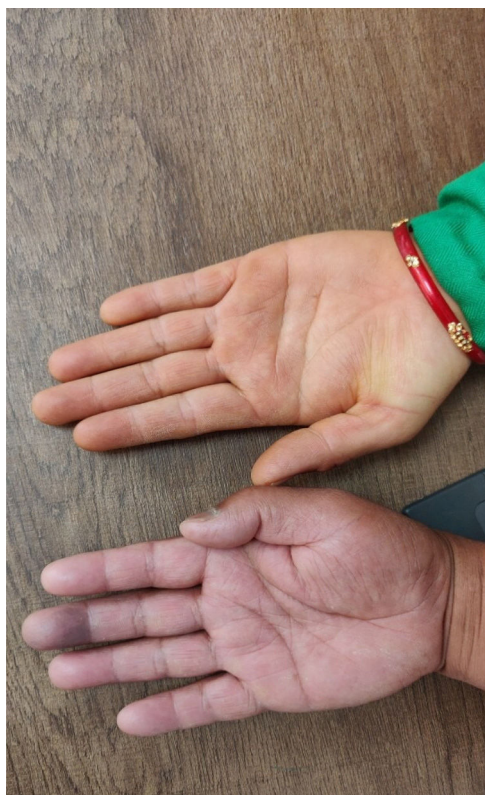


Fig. 1. Comparison of palm of patient (yellowish) and her husband.

bilirubin levels, blood urea nitrogen, creatinine, as well as fasting lipid profile and urine routine examination were normal. She was advised for laboratory investigation of liver function test and other parameters by her previous treating physician also. In every round of investigation, the reports were normal. She also underwent contrast imaging study of her abdomen and it was normal. The normal bilirubin level, but with yellow palm and soles frustrated her. She also took ayurvedic medicine for her illness but no improvement was seen. She thought, she had severe jaundice. Among the foods that were advised by her relatives for her jaundice were fruits and vegetables like carrots, pumpkin and tomatoes. On perceiving that she had increased severity of jaundice she started eating more and more carrots and pumpkin. This history of intake of carotene rich foods led us to investigate for beta carotene level. Her serum beta carotene level was ordered which was very high than normal (761.50, reference range: 48–200 $\mu\text{g/dL}$). In the context of the patient's clinical history, physical examination and laboratory findings, a diagnosis of carotenemia secondary to increased consumption of nutritional supplements rich in vitamin A was made.

Patient was then advised to cut down the quantity of carrots and pumpkin intake and was also advised to take vitamin A rich diet less frequently. The regular medicine for hypothyroidism and hypertension was continued.

Discussion and conclusion

“Aurantiasis cutis”, also known as beta-carotenemia is a cause of yellow pigmentation of the skin related to excess carotene

ingestion. Carotenemia can be diagnosed by high serum level of beta carotene along with normal liver function test and Vitamin A level. Accumulation of beta-carotene in the skin is delayed by up to two weeks, in contrast to the serum. Carotenemia can be seen even in normal intake of carotenoids like in diabetes, hypothyroidism, liver disease, type III hyperlipoproteinemia and use of some drugs.^{5–7}

In this case, the patient had dietary habit of high intake of carotene containing foods like carrot, tomatoes, pumpkin, spinach etc., because she had yellow skin and she was aware of the fact that carotene intake would help her get well from jaundice.

Hyperbilirubinemia is the most important differential diagnosis for carotenemia. This patient had normal bilirubin level in multiple testing. Carotenemia may be observed several weeks after initiation of diet rich in carotenoids. However, the association between total ingestion amounts and presentation of the symptom depends on factors like cooking method, thyroid hormone status, concurrent infection, pH of gastric juice and liver/pancreatic function. Physiologically, carotene is converted to vitamin A in the duodenum. Decreased conversion, which can be associated with diabetes mellitus, liver disease, and hypothyroidism, can result in high carotene levels in the blood. In the index case, she has history of hypothyroidism which can have additive effect in skin discoloration apart from increased intake.⁷

Since carotenemia is quite harmless, therapy is directed to regulation of dietary habits. It is important to reduce carotenemia to prevent complication related to prolonged carotenemia.

The habit of excessive consumption of Vitamin A rich foods when suffering from jaundice is a common food habit in Nepal. This can result in beta-carotenemia. Awareness regarding type and quantity of dietary intake in various health conditions should be done by the health care personnel.

Consent

Written consent was obtained from the patient for publication of this case report.

Funding

None

Conflict of interest

None.

References

- Hughes JD, Wooten RL. The orange people. *JAMA* 1966;197:730–1.
- Sale TA, Stratman E. Carotenemia associated with green bean ingestion. *Pediatr Dermatol* 2004;21:657–9.
- Takita Y, Ichimiya M, Hamamoto Y, Muto M. A case of carotenemia associated with ingestion of nutrient supplements. *J Dermatol* 2006;33:132–4.
- Kiuchi S, Ihara H, Koyasu M, Tani A, Kakinoki T, Shino Y, et al. Relation between serum levels of thyroid hormone and serum β -carotene concentrations in patients with thyroid disorders. *Int J Anal Bio-Sci* Vol 2018;6.
- Royer M, Bulai CL, Periquet B, Maybon P, Lamant L, Mazereeuw-Hautier J, et al. Orange skin and xanthomas associated with lycopenaemia in a setting of type III dyslipoproteinemia. *Ann Dermatol Venereol* 2009;136:42–5.
- Aktuna D, Buchinger W, Langsteger W, Meister E, Sternad H, Lorenz O, et al. Beta-carotene, vitamin A and carrier proteins in thyroid diseases. *Acta Med Aust* 1993;20:17–20.
- Chiriach A, Chiriach AE, Pinteala T, Gologan E, Solovan C, Brzezinski P. Yellow palms and feet in a child. *Russ Open Med J* 2014;3:107–10.