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Studies of serum carotenoids and vitamin A of some hypercarotenemic children in Sri Lanka

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Long-term consumption of very high levels of absorbable carotenoids shows yellowing of palms, soles and other parts of the body. In Sri Lanka the main reason is over-consumption of papaw, carrot and pumpkin. A study was carried out to determine the serum carotenoid profile of hypercarotenemic subjects. Their sera were yellow in colour compared to the sera of the control subjects. The serum of hypercarotenemic patients (n=8) was examined by high performance liquid chromatography (HPLC) technique for carotenoids and vitamin A. In six of the cases a common profile was shown with β-carotene (9.9 - 35.7 μg/dL), β-cryptoxanthin and mono hydroxy metabolites collectively (5.3 - 48.5 μg/dL) and 6-8 metabolites (22.5 - 282.1 μg/dL) corresponding to di, tri and poly hydroxy derivatives of the β ionine ring. These metabolites were deduced from past studies done abroad. In all these cases vitamin A levels were within normal range (32 - 61 μg/dL). The other two cases were abnormal. One showed low β-carotene (3.5 μg/dL) and no β-cryptoxanthin and mono hydroxy metabolites but normal di, tri and poly hydroxy metabolites (128.2 μg/dL). This could be interpreted as being due to the high carotenoid diet being discontinued for sometime before venesection. However, vitamin A level was high (75.2 μg/dL) but still lower than upper level of normal (81 μg/dL). The other case showed high β-carotene (212.3 μg/dL) and β-cryptoxanthin (49.3 μg/dL) but no other normal mono, di, tri and poly hydroxy metabolites. Instead there was a more hydrophobic metabolite (343.9 μg/dL) than β-cryptoxanthin, which according to results cannot be further metabolized. This is probably due to formation of a metabolite that is not recognized by liver enzymes for further hydroxylation and subsequent excretion. In all cases hypercarotenemia was observed only after prolonged consumption of mainly papaw and carrot and less frequently pumpkin, whose metabolites cannot be clearly recognized as lutein overlaps with di-hydroxy metabolites. In view of the above results, parents should

be advised against over feeding with carotenoid rich foods, as this can lead to conditions that can be potentially more complicated than typical hypercarotenemia. Atypical hypercarotenemia is a function of the subject. It does not vary with carotenoids as all absorbable carotenoids of carrot, papaw and pumpkin have the same catabolic pathway.

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