Hypervitaminosis A causing benign intracranial hypertension

A case report

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Summary

Hypervitaminosis A is a well-recognized clinical entity, but the toxic manifestations develop so insidiously and involve so many systems that diagnosis can easily be missed or delayed. A patient with juvenile chronic arthritis developed benign intracranial hypertension and other manifestations of excessive vitamin A intake and made a complete recovery after it was withdrawn. Vitamin A is a non-prescription drug and any history of its ingestion must be obtained during evaluation of papilloedema. A plea is made for the public to be repeatedly reminded that no proposed remedy is safe or effective until it is demonstrated to be so.

When first seen at the Princess Alice Orthopaedic Hospital in January 1986 he appeared considerably sunburnt. His weight was 26.4 kg, the chest was clear, the blood pressure 105/60 mmHg, and a grade 1-2 ejection systolic murmur was heard at the apex. A few spongy, discrete, non-tender axillary lymph nodes were palpable, but there was no liver or spleen enlargement. Joint examination showed widespread involvement with swelling and limitation of the movement range of most joints (including the temporomandibular joints). There was mild flexion deformity at the knees, hips and elbows, and a poor grip strength.

The patient was seen again 2 months later. In general he seemed much improved. The synovitis was greatly reduced but stiffness was still prominent. Lymphadenopathy had subsided. There was a nodular flexor tendon synovitis of the fingers.

Another 2 months later there was little change, but he complained of headache not relieved by analgesics. The following week the headache was more intense and persistent; it was followed by double vision a few days later. He was noted to have papilloedema and after this was confirmed by an ophthalmologist, he was referred to a neurologist who agreed that benign increased intracranial hypertension could explain the symptoms. The blood pressure was 90/60 mmHg. The skin generally was hyperaemic and he had a scaly rash associated with intense pruritus. There was evidence of hair loss and he was initially very irritable. His appetite was poor.

All treatment (chloroquine, diclofenac sodium and prednisone) was discontinued. Interrogation then revealed that he had been taking 10 drops (125 000 IU vitamin A) daily of a vitamin preparation prescribed by a traditional medical practitioner for approximately 6-9 months. This was also discontinued.

During the course of the next few days the patient became increasingly drowsy, the skin started peeling, and hair fall-out increased. It was interesting to note the absence of active synovitis and an increased range of joint movement. During the course of the next 2 weeks the level of consciousness improved, headache was relieved, he became less irritable, his appetite returned. Funduscopy was normal 4 months later, normal hair growth had been restored and the skin also appeared normal.

Investigations showed normal urinalysis, haemoglobin (previously 9.0 g/dl) 13.0 g/dl, erythrocyte sedimentation rate (previously 136 mm/1st h (Westergren) 30 mm/1st h, serum sodium value 135 mmol/l, potassium 3.9 mmol/l, chloride 100 mmol/l, bicarbonate 22 mmol/l, urea (initially 17 mmol/l), calcium 2.44 mmol/l, vitamin A 6.9 μmol/l. Cerebrospinal fluid chemistry and microscopic examination was normal — pressure 350 mm H2O; computed tomography showed increased intracranial pressure and slightly enlarged ventricles.

Discussion

Doctors and patients are frequently unaware of the toxic effect of excessive vitamin A ingestion. Acute hypervitaminosis A is
perhaps more easily recognised but consumption of smaller amounts of vitamin A has more insidious effects and the diagnosis may be delayed for years. The widespread abuse of these preparations is associated with their over-the-counter availability because they are not classified as drugs.

The normal amount of vitamin A required is approximately 30 IU/kg/d although daily intakes of 1400 IU for neonates have been recommended. The recommended dietary allowance for adult men is 5000 IU daily and 4000 IU daily for non-pregnant non-lactating females. Normal adult serum levels for vitamin A range from 2.09 μmol/l to 4.71 μmol/l.

Vitamin A is often prescribed for acne vulgaris, Darier's disease and ichthyosis. More recently, supplements have been recommended as prophylaxis against acute respiratory infections, as exerting a favourable influence on the incidence and course of bronchopulmonary dysplasia, and to reduce morbidity and mortality from the respiratory complications of measles (G. Hussey — personal communication). These recommendations could prove to be dangerous because, vitamin A being a non-prescription substance, they could lead to widespread, indiscriminate, unregulated and uncritical administration in excessive doses for prolonged periods for these and a host of other unproven indications.

Toxicity may arise from indiscriminate and excessive medication. Overdosage is usually chronic and most often occurs in children. Infants and young children seem to be more sensitive to increased intakes of vitamin A. Most cases are due to mothers giving large amounts of fish-liver oils to their children in the mistaken belief that it is good for them. The dose required to produce toxicity varies widely and may range between 25 000 and 500 000 IU daily. But toxicity may occur with substantially lower doses in malnourished children because the liver's role in vitamin A metabolism is functionally circumvented.

The manifestations of vitamin A intoxication are protean and may involve many organ systems. It can produce hair loss, desquamative dermatitis, cheilosis, gingivitis, otitis, epistaxis, lymphadenopathy, anaemia, ascites, hepatosplenomegaly, skeletal pain, headache, papilloedema, nausea, vomiting, diarrhoea, drowsiness, blurring of vision, and dizziness. On withdrawal of medication, complete reversal of the abnormalities can be obtained. Improvement usually begins within 3 weeks. The prognosis is good and death appears to be a rare sequel.

The observation that the patient's synovitis went into remission concurrently with the decrease in toxicity caused by vitamin A is of interest. The phenomenon of improvement in joint symptoms has previously been noted by us on several occasions: in a patient with systemic-onset juvenile chronic arthritis on gold therapy who suffered acute liver failure; in another similar patient on treatment with penicillamine who developed pancycopenia and Shigella septicaemia; in 2 patients after varicella infection; and in 1 patient during an adverse response to a gold injection of gold.

That some accidental complications such as measles, scarlet fever and catarrhal jaundice have been followed by distinct improvement in the joint symptoms in juvenile chronic arthritis was first noted by Still. Hench later emphasised the temporary remission occurring in patients who contract intercurrent liver disease, and recently Komreich et al. reported 7 patients in whom acute hepatic dysfunction was accompanied by rapid improvement in joint symptoms. While it is tempting to postulate that the mechanism underlying the remission of the synovitis is intimately associated with hepatic insult, not all the associated conditions mentioned are accompanied by liver injury.

In order to protect the public from nutrition cultism, efforts need to be directed towards countering the mass marketing of nutrition misinformation by promoters of questionable nutrition practices. It is necessary not only to keep the public informed about sound nutrition concepts, but also to remind the medical community not to accept uncritically undocumented and unfounded statements about nutrition and health, and to be aware of the potential dangers associated with the excessive use of vitamins. It is also important to beware that we do not merely pay lip service to the modern concept of care by a multidisciplinary team when in fact we are only practising fragmented medicine.

We wish to thank Professor O. L. Meyers for his assistance and advice in the preparation of this manuscript.

REFERENCES