Plasma ACTH and melanocyte-stimulating hormone in nail pigmentation

Pigmented banding of nails has been reported to occur with some anticancer agents such as cyclophosphamide (Shah et al., 1975), 5-FU and nitrogen mustard (Moore and Meiselbaugh, 1975), and also with exposure to x-rays (Sutton, 1952; Inalshingh, 1972). Priestman and James (1975) reported 3 cases in which nail changes were possibly due to doxorubicin. They speculated that this drug has a selective hormone-suppressive action which might allow an excess of melanocyte-stimulating hormone (MSH) to be released from the pituitary.

We report, however, a case of non-Hodgkin's lymphoma with similar nail banding during combination chemotherapy with doxorubicin, cyclophosphamide, vincristine, and prednisone (Gottlieb et al., 1973) without raised plasma ACTH and β-MSH levels.

Case report

A 10-year-old Japanese girl was admitted on 3 September 1975 with a 2-month history of headaches in the right temporal region. A round hard tumour, 2 cm in diameter, was found there. A diagnosis of non-Hodgkin's lymphoma was made by total extirpation 9 days later. After radiation therapy and systemic chemotherapy combined with vincristine, cytosine arabinoside, 6-mercaptopurine riboside, and cyclophosphamide, remission was achieved in about 4 months. In the following March a massive invasion to the gums and enlargement of both kidneys were noticed. One week later a 5-day repeated course of combination chemotherapy with a two-week cycle was started. During the first cycle of this therapy, the metastatic lesions noted above were nearly eradicated and in May, shortly after completion of 3 cycles, a black longitudinal band, and a brown transverse band were noticed in the nail of the left thumb (Fig.). The total doses administered up to this time, were cyclophosphamide 9000 mg and doxorubicin 120 mg. 3 weeks later this transverse

Fig. Pigmented transverse bands in both thumb nails and a longitudinal band in the left thumb nail in a 10-year-old girl.
banding had developed in all fingernails and increased to two to three bands in each. The toenails were normal. Plasma specimens taken before, during, and after a 5-day course of combination therapy showed that ACTH levels were 55, 94, and 40 pg/ml, respectively, and β-MSH was undetectable (<50 pg/ml).

Discussion

ACTH and MSH are known to have the potential to induce darkening of human skin. It has also been shown that both hormones are capable of forming pigmented bands in fingernails (Lerner and McGuire, 1964). Bondy and Harwick (1969) reported a case of longitudinal nail banding with a markedly raised plasma MSH which appeared after bilateral adrenalectomy. This evidence indicates that the nail changes in patients with tumours could be due to an increased release of ACTH and/or MSH from the pituitary following hypoadrenalism, which is caused through some undetermined mechanism by anticancer agents. However, plasma levels of these hormones in our case do not support this. We therefore believe that an alternative hypothesis may be necessary to explain the appearance of the nail pigmentation.

Summary

In order to elucidate the mechanism of the pigmented banding in the fingernails in patients with malignant disease, plasma ACTH and β-MSH levels were determined in a 10-year-old Japanese girl with non-Hodgkin’s lymphoma. The pigmented banding appeared during treatment with a combination of doxorubicin, cyclophosphamide, vincristine, and prednisone. Specimens taken before, during, and after a 5-day course of therapy showed that ACTH was 55, 94, and 40 pg/ml, respectively, and β-MSH was <50 pg/ml in all 3 samples.

We are grateful to Dr Yukio Hirata, Department of Internal Medicine, University of Kobe School of Medicine for assay of plasma ACTH and β-MSH.

References


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Early onset of homozygous β-thalassaemia associated with neonatal jaundice

Thalassaemia major usually manifests itself only at 2 to 3 months of age (Weatherall and Clegg, 1972; Oski and Naiman, 1972). A defect of β-chain synthesis in fact would not be expected to reduce total haemoglobin concentration and lead to a high degree of α-chain precipitation until after the first few months of life when the synthesis of γ-chain has declined sufficiently and the synthesis of β-chain predominates. This paper concerns an infant with homozygous β-thalassaemia with onset of severe anaemia at 5–6 weeks of age after exchange transfusions for hyperbilirubinaemia of unknown aetiology.

Methods

Haematological values were determined on a Coulter Counter model ZBI. Osmotic fragility was assessed by the Simmel method (Silvestroni and Bianco, 1945). HbA₉ was determined by DE-microchromatography (Huisman et al., 1975), and HbF by the method of Singer et al. (1951). Globin chain synthesis was measured in the peripheral blood reticulocytes by methods previously described (Kan et al., 1968).