CASE REPORTS
Year: 2018 I Volume: 1 I Issue: 2 I Page: 61-63

CARBON BABY SYNDROME: A RARE CASE REPORT

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Abstract

Carbon baby syndrome, also known as universal acquired melanosis is one of the causes of diffuse hyperpigmentation of skin and mucosa with only a limited number of cases reported in the literature. Here we report a case of 11 month old female child of universal acquired melanosis. Increased pigmentation as noticed by the parents started over the face, which then gradually progressed over next 4-5 months to involve the whole body. Clinically the case was diagnosed as carbon baby syndrome, thus being reported because of its rarity.

Key words: Carbon baby, Universal acquired melanosis

Introduction

Carbon baby syndrome is an extremely rare condition which is characterised by progressive pigmentation of the skin during childhood, resembling that seen in black races. The major determinant of normal skin colour is the melanin, produced by melanocytes of basal layer of epidermis. Melanin production normally is not maximal in the newborn skin. As a result, all babies, irrespective of race, may look slightly tanned or red in color at birth. Within the first few weeks, racial color becomes more evident because melanin production is stimulated by exposure to light.[1] This case is being reported here for its unusual occurrence.

Case Report

An eleven month old female child born of non-consanguineous marriage was brought to dermatology OPD with complaints of progressive darkening of whole body. Her mother had uneventful prenatal, natal and postnatal periods. The pigmentation was noticed by the parents at the age of 21 days over face and then gradually progressed over next 4-5 months to involve whole body. There was no history of fever, skin infection, darkening of urine, photosensitivity or any other systemic complaints. There was no history of drug intake prior to onset of hyperpigmentation. Past and family history was unremarkable. Elder sisters were normal.

On examination, child had generalised diffuse hyperpigmentation over whole body. Face showed patchy areas of normal skin. The sun exposed areas were darker than sun protected areas (figures 1-4).

Discussion

There are multiple causes of diffuse hyperpigmentation of the skin in infancy. Classifications based on both clinical and histological findings increase the accuracy of diagnosis.

Figure 1-4: Generalised diffuse hyperpigmentation over whole body. Face shows patchy areas of normal skin

Generalised pigmentation in a child may be seen in a variety of disorders which can be clinically differentiated.[1,2] Ruiz-Maldonado described a single case of progressive hyperpigmentation in which a child developed pigmentation at

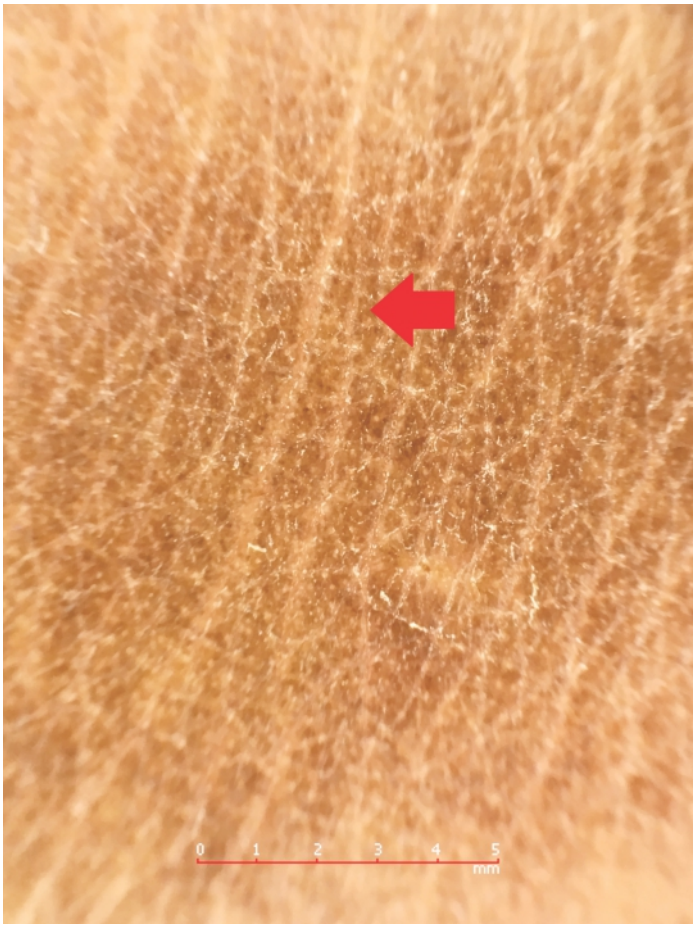

Figure 5: Dermoscopic examination at 20X magnification under polarised light showing accentuation of pigmentation over extremities (red arrow)

the age of three months and became jet black by the age of 4 years. He described him as "carbon baby". Histological examination of this patient showed heavy melanin deposition throughout the epidermis with minimal dermal pigmentation. There was no increase in the number of melanocytes.[3] Our patients showed similar clinical features. Kaviarasan et al.[9] reported a similar case in a 3-year-old Indian girl who developed progressive diffuse hyperpigmentation by the age of 5 months. Histopathology revealed increased melanin deposition in epidermal basal layer.

Furuya and Mishima[4] reported a Japanese child with progressive pigmentary disorder. This child developed hyperpigmentation at the age of 3 months. At 4 years of age the child was mentally retarded with partial hyperpigmentation of the body. Biopsy revealed hyperkeratosis, papillomatosis and proliferation of melanocytes. Familial progressive hyperpigmentation has been described in kindred. This condition is characterized by hyperpigmented patches that are present since birth and increase in size and number as the infant grows. Most of the skin and mucous membrane surface show increased pigmentation. Microscopically, the melanin granules are more numerous and larger than normal.[5]

Familial progressive hyperpigmentation was excluded in our patient as the skin lesions were not seen at birth. Kint et al.[6] described two cases of congenital diffuse melanosis in which the patients developed hyperpigmentation shortly after birth which invaded progressively the trunk and limbs. The pigmentation was diffuse on the abdomen but reticulated on the neck and groin. On electron microscopy, they found the melanosomes were not grouped within the keratinocytes but dispersed within the cytoplasm of the epidermal cells.[6]

Adrenoleukodystrophy, an X-linked acquired neurodegenerative disease characterised by generalized hyperpigmentation with a slowly progressive involvement of the brain and adrenals. Patient develops uniform macular hyperpigmentation which spares the palms and groin area. This disease is characterized by the accumulation of unsaturated fatty acids with a chain of 24-30 carbons, particularly hexacosanoate in the adrenal cortex and in certain sphingolipids of the brain.[10]

Bronze baby syndrome is a rare acquired generalized pigmentary disorder which occurs in the neonates. It is characterized by gray-brown discoloration and occurs in patients with hepatocellular dysfunction undergoing phototherapy. Porphyrin compound undergoes photo destruction which results in a brown substance that is deposited in the skin.[7]

In reticulate acropigmentation of Kitamura freckle-like pigmentation appears on the dorsa of hands which spread all over the body later. It manifests in the first two decades of life. In Haber syndrome, there is rosacea-like eruption with keratotic plaques and pitted scars. Acropigmentation of Dohi shows symmetrical dyschromatosis of extremities.

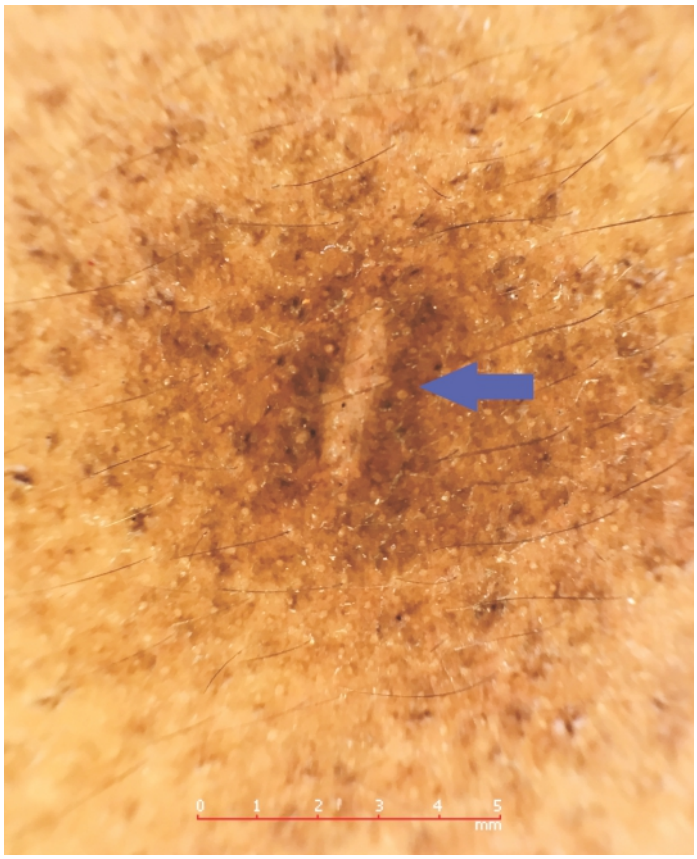

Figure 6: Dermoscopic examination at 20X magnification under polarised light revealing granular brownish deposits over trunk-epidermal pigmentation (blue arrow)

Franceschetti-Jadassohn-Naegeli syndrome starts as reticulate pigmentation during the second or third year associated with palmo-plantar keratoderma and hypohidrosis with intolerance to heat. In Cantu syndrome brown macules develop in adolescence on the face, forearms and feet along with hyperkeratosis of palms and soles. In dermatopathica pigmentosa reticularis there is widespread reticulate pigmentation with pigmentary incontinence in histopathology. All these syndromes were ruled out as the pigmentation was not reticulate or punctate in character.

Universal acquired melanosis is a diagnosis of exclusion. It is a progressive condition; long-term prognosis and treatment is not established. Our patient did not have any evidence of inflammatory condition. We also excluded systemic conditions like Addison's disease, heavy metal toxicity and hemochromatosis from the history, clinical features and laboratory findings.

The etiology of pigmentation in our case is yet unknown. The following hypothesis can be proposed for its occurrence. The role of excessive production of β melanocyte-stimulating hormone, abnormal sensitivity of melanocytes towards normal or abnormal endocrine or neural stimuli and finally to a genetic mutation, which is not yet detected at the chromosomal level. As "carbon baby syndrome" is a rare case, so it is worthy of reporting.

How to cite this article:
Mahajan BB, Budhwar J, Chojer P, Singla C. Carbon baby syndrome: a rare case report. JDA Indian Journal of Clinical Dermatology 2018;2:61-63.

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