Case Report: Incontinentia Pigmenti Associated with Oculocutaneous Albinism

Okasha M G[1,2], Seitz B[1], and Käsmann-Kellner B[1]

[1]Department of Ophthalmology, Saarland University Medical Center UKS, Homburg/Saar, Germany
[2]Department of Ophthalmology, Al – Azhar University, Cairo, Egypt
berthold.seitz@uks.eu; kaesmann@gmail.com

Abstract: Aim: To describe unusual ocular presentation associated with incontinentia pigmenti (IP) and theorize a protective effect for this association. **Setting**: Department of Ophthalmology, Saarland University Medical Center UKS, Homburg/Saar, Germany. **Methods**: 18-month-old girl already diagnosed with IP had complete clinical ophthalmological examination, orthoptic assessment as well as genetic analysis. **Results**: Clinical diagnosis of oculocutaneous albinism (OCA) was confirmed in our IP patient along with ocular associations with IP. Genetic analysis revealed11,7 kb deletion in exons 4-10 of IKBKG gene. The chance is 25% for the next child of the family for IP. **Conclusions**: This paper reports a case of a premature girl of a twin pregnancy with IP associated with OCA and theorize whether OCA hypopigmentation would protect her from melanin associated complications of IP.
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1. Introduction

Incontinentia pigmenti (IP), also known as Bloch-Sulzberger syndrome is a rare, X-linked, dominantly inherited skin disorder due to mutation in the IKBKG gene (Inhibitor of Nuclear Factor Kappa B Kinase Subunit Gamma) which is mapped to Xq28.[1]Cutaneous manifestations result in areas of mixed hyper-/hypopigmentation disorders associated with ocular, dental, hair and central nervous system abnormalities. The main cutaneous feature of the disease classically evolve through four stages: (1) perinatal inflammatory vesicles. (2) Verrucous patches. (3) a distinctive pattern of hyperpigmentation. (4) Dermal scarring. The erythematous eruption with linear vesiculation in the newborn period is followed by a verrucous stage. Cutaneous lesions in all stages tend to follow Blaschko's lines. As the disease is often fatal in males, females are primarily affected.[2]

Oculocutaneous albinism (OCA) is a group of rareautosomal, recessively inherited disorders, characterized by a reduction or complete lack of melanin pigment in the skin, hair, and eyes. Patients with OCA have increased risk of skin cancer, congenital visual impairment, and other visual anomalies.[3]

2. Case study

An 18-month-old girl born at 32 weeks' gestation (twin pregnancy, healthy brother and patient with severe hypotrophy, 700g birth weight) already diagnosed with IP was referred to our department of Pediatric Ophthalmology, Orthoptic, Low Vision, Neuroophthalmology. Family history revealedthat the girl's mother has similar symptoms in the hair, skin, and teeth. The mother also has pigmented areas on both legs with a positive history of the mother's sister and the mother's grandmother have similar skin affections. The father's brother has OCA but the caucasian parents are not related.

Figure 1: Pigmented arcade-like alterations. The Blaschko's lines cannot be seen her in our patient due to her coincident OCA1A (which is classically seen with IP). Therefore, the primary inflammation due to the genetic defect will, of course, take place, but the hyperpigmented scar formation will not be hyperpigmented.

General examination revealed pigmented arcades like lesions in the extremities (Fig1), delayed dentition, and focal alopecia. Visual assessment revealed the girl can fix and follow a moving object and to dampen nystagmus she assumes a compensatory head posture (chin down). Anterior segment examination revealed4th-degreeiristransillumination, rounded regular reactive pupil, and centralclear lens. Posterior segment examination revealed4th-degreeoptic disc dysplasia, 3rd degreemacular dysplasia. Orthoptic examination revealed pendular horizontal nystagmus with middle to high frequency, objective refraction (retinoscopy) right eye: +7 / -2/ Axis 180°; left eye: +6 / -2, 5 / Axis 14 °, visually handicapped, and glasses were prescribed.

An alternating patching occlusion therapy, 30min/d was recommended. Also, we recommended dark glasses that would reduce sun sensitivity (photophobia), skin protection from sun exposure with the use of clothing and sun block to reduce the risk of skin damage, and skin cancer.

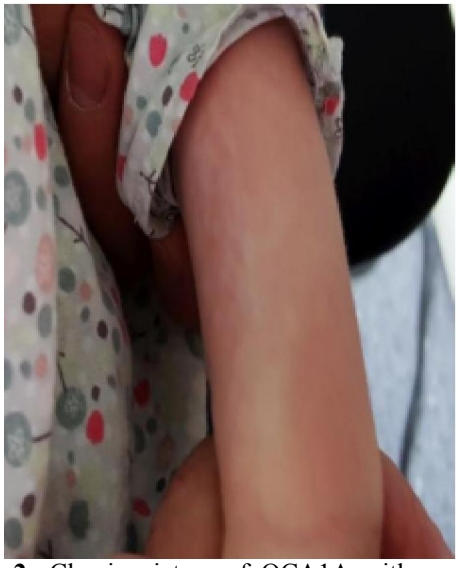

Figure2: Classic picture of OCA1A with complete absence of melanin pigment resulting in white hair and white skin at birth and iris transillumination.

3. Discussion

Normal skin pigmentation depends upon efficient melanin synthesis and melanosome maturation within melanocytes. Several hundred genes are known to modulate the pigmentation type or pattern in skin, hair, and eyes during or after development. Both OCA and IP are considered skin pigmentation disorders with recognized genetic background.[4]

Incontinentia pigmenti is a genetic neuroectodermal disease which first leads to chronic inflammatory skin lesions. When the inflammation subsides, it often leaves skin scars with shattered pigmentations. Therefore, the name Incontinentia pigmenti actually describes the residual effects of the primary inflammatory disease and not the primary pathogenic mechanism.[5]

Clinical manifestations are usually more evident in sporadic than in familial cases. Cutaneous manifestations occur in all sporadic cases and about 96% of familial cases.[6]The girl we present only shows chronic inflammatory skin lesions and this may be contributed to its familial inheritance. According to genetic counseling, IP in our patient and her relatives on the mother's side is a result of 11,7kb deletion in exons 4-10 of IKBKG gene. The chance is 25% for the next child of the family for IP.

Scarring alopecia on the vertex is reported to occur in 28-66% of patients.[7] These lesions were present in our patient and have been recognized in the literature as a late, and often clinically subtle sign.[7]Between 65% and 80% of IP patients have dental abnormal ities such as anodontia, and delayed dentition.[7]Our patient shows delayed dentition.7-40% of IP patients have nail abnormalities, and neurologic manifestations in 13–35% of IP patients, but both types of lesions were not present in our patient.[7]Although ocular manifestations of IP are reported in 35% patients, they may be more frequent than previously believed because of under-diagnosed ocular changes. The ophthalmologic manifestations of IP include strabismus, nystagmus, microphthalmia, cataracts, glaucoma, and retinal detachment. Many ofthe ocularcomplication are secondary to advanced proliferative retinopathy.[5] Our patient hasnystagmus which we attribute to OCA and considered to be sensory deficient nystagmus.

OCA1 A is the most severe form of OCA, with complete absence of melanin. Individuals with OCA1 A are born with white hair at birth and irises that do not become darker over time (Fig2), while those with the other types (OCA 1B, OCA 2-6) accumulate more pigment over time.

Ocular manifestations of OCA include reduced visual acuity, refractive errors, reduced iris pigment (iris transillumination), reduced retinal pigment, lack of development of the macula (macular hypoplasia) resulting in abnormal foveal development. The absence of melanin also leads to optic nerve fiber misrouting, which may contribute to strabismus and reduced stereoscopic vision (depth perception).[3] Our case had4th-degree iris transilluminations defects, albinotic fundus with severe macular and optic nerve dysplasia.

There are 6 known types of OCA.[8] Often albinism will form small quantities of melanin with age and have blond or fawn-colored hair and blue

eyes. Skin cancer is common in OCA especially in type 2 and almost all of these are squamous cell carcinomas. Explained by the fact that, the lightly pigmented skin has a dramatically increased risk of skin cancers, including melanomas, much higher than in darker skin. Furthermore, skin pigmentation is the most important photoprotective factor, since melanin, besides functioning as a broadband UV absorbent, has antioxidant and radical scavenging properties. Besides, many epidemiological studies have shown a lower incidence of skin cancer in individuals with darker skin compared to those with fair skin.[9] We theorize that OCA associated hypopigmentation would protect our patient from hyperpigmentation associated complications of IP.

4. Conclusion

The ophthalmologic manifestations of IP may include OCA. In addition, OCA associated hypopigmentation would protect from hyperpigmentation associated complications of IP. Long-term and multidisciplinary follow-up is needed, particularly during the first year of life, especially between dermatologists, ophthalmologists, pediatricians, and neurologists.

References

1. Soltirovska Salamon, A., Lichtenbelt, K., Cowan, F. M., Casaer, A., Dudink, J., Dereymaeker, A, de Vries, L. S. Clinical presentation and spectrum of neuroimaging findings in newborn infants with incontinentia pigmenti. Dev. Med. Child Neurol.2016; 58(10): 1076-84.
2. Minic S, Trpinac D, Obradovic M. Incontinentia pigmenti diagnostic criteria update. Clin Genet. 2014;85(6):536-42.
3. Summers CG. Albinism: classification, clinical characteristics, and recent findings. Optom Vis Sci.2009;86(6):659-62.
4. Mort RL, Jackson IJ, Patton EE. The melanocyte lineage in development and disease development. 2015;142(4):620-32.
5. Holmstrom G, Thoren K. Ocular manifestations of incontinentia pigmenti. Acta Ophthalmol Scand. 2000;78(3):348-53.
6. Poziomczyk CS, Bonamigo RR, Santa Maria FD, Zen PR, Kiszewski AE. Clinical study of 20 patients with incontinentia pigmenti. International journal of dermatology. 2016;55(2):87-93.
7. Swinney CC, Han DP, Karth PA. Incontinentia Pigmenti: A comprehensive review and update. Ophthalmic Surg Lasers Imaging Retina. 2015;46(6):650-70.
8. Käsmann-Kellner B, Seitz B. Phänotyp des visuellen Systems bei okulokutanem und okulärem Albinismus. Der Ophthalmologe. 2007;104(8):648-61.
9. Onuigbo W. Albino skin cancer will end if a communitys cancer surveillance program is successful. J Health Edu Res Dev. 2016;4(161):2-3.

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