

Case Reports

Xeroderma Pigmentosum with Squamous Cell Carcinoma: A Case Report and Literature Review

ASM MONIRUZZAMAN¹, MN ABSAR², SHAMSUZZAMAN SARKER³, MAHMUDUL HAQUE SARKER⁴, MD. ABDUS SATTAR⁵, CHANDAN KUMAR SHAHA⁶, ATANU KUMAR BASAK⁶, MD. KHAIRUZZAMAN⁷

Introduction

Xeroderma pigmentosum (XP) is a very rare skin disorder. This is caused by a cellular hypersensitivity to ultraviolet (UV) light as a result of a defect in the DNA repair system¹. Xeroderma pigmentosum (XP) was first described in 1874 by Hebra and Kaposi. In 1882, Kaposi coined the term xeroderma pigmentosum for the condition, referring to its characteristic dry, pigmented skin².

Xeroderma pigmentosum occurs worldwide and affects people of all races. Males and females alike can have the condition. Couples who are each carriers of the xeroderma pigmentosum trait are at greater risk of producing a child with xeroderma pigmentosum. Parents already with a child with xeroderma pigmentosum have a 1 in 4 chance of having another child with xeroderma pigmentosum¹. Xeroderma pigmentosum (XP) occurs with an estimated frequency of 1: 25000 in United States and Europe. In Japan, it is 1 case per 40,000 population^{2,3}.

XP is categorized in at least eight complementation groups according to the capacity of the body to repair DNA. These groups (i.e., genetic subtypes) are labeled A through G, plus the XP variant: XPV. Groups A, C, D, and Variant make up over 90% of XP cases. Group A, for example, has the lowest level of DNA repair and the most neurological manifestations⁴. In classical XP, the median age of onset of the cutaneous symptoms is between 1 and 2 years. The sun-exposed skin becomes dry, pigmented and parchment-like, with freckle-like hyperpigmented macules. Premalignant actinic keratoses develop at an early age⁵.

No consistent routine clinical laboratory abnormality is observed in individuals with XP. The diagnosis of XP can be established with studies performed in specialized laboratories. These studies include cellular hypersensitivity to UV radiation and chromosomal breakage studies, complementation studies, and gene sequencing to identify the specific gene complementation group².

Management is limited to avoidance of exposure to damaging UV radiation by staying indoor with sunlight blocked out. The patient should adapt to a life style to minimize UV exposure by wearing protective clothing, sunscreens, sunglasses and long hair styles in order to reduce the incidence of cutaneous malignant changes. Also, avoid other known carcinogens^{3,4}.

Regarding medical care, oral retinoids have been shown to decrease the incidence of skin cancer in patients with XP. Chemical therapy with 5-fluorouracil may be useful for actinic keratoses. A new approach to photoprotection is to repair DNA damage after UV exposure. This can be accomplished by delivery of a DNA repair enzyme into the skin by means of specially engineered liposomes. Surgical Care includes complete excision of the malignancies associated with XP².

Regular surveillance for and treatment of all neoplasms is very important⁴. Regular visits to the dermatologist might be necessary for the purposes of patient education as well as early detection and treatment of any malignancy². Ophthalmologic and a neurologic consultations are recommended for XP.

There is no cure for XP. The DNA damage is cumulative and irreversible⁴. The disease is often fatal before the age of 20 years. Survival beyond middle age is sometimes possible in mild cases with adequate treatment⁶. Two important causes of mortality are metastatic malignant melanoma and squamous cell carcinoma².

Case Report

A 3½ year-old boy hailing from a poor rural household was admitted at Rangpur Medical College Hospital in September 2004 with the complaints of

1. Assistant Professor, Department of Paediatrics, Rangpur Medical College, Rangpur
2. Professor and Head of the Department of Paediatrics, Rangpur Medical College, Rangpur
3. Associate Professor, Department of Pathology, Rangpur Medical College, Rangpur
4. Assistant Professor, Department of Dermatology and Venereal Diseases, Rangpur Medical College, Rangpur
5. Assistant Professor, Department of Ophthalmology, Dinajpur Medical College, Dinajpur
6. DG Health, Mohakhali, Dhaka
7. IMO, Rangpur Medical College Hospital, Rangpur

Correspondence: Dr. ASM Moniruzzaman

numerous small blackish spots on the whole body, particularly abundant over the face, scalp, upper part of the trunk and upper limbs from the age of six months. Initially the lesions were on the face, more marked on both sides of the nose; then the lesions gradually spread all over the body. He experiences intense itching and burning sensation on sun exposure. The child is also suffering from redness of both eyes almost constantly with watering and purulent discharge at frequent intervals for the same duration. There is also marked photophobia. There is no history of consanguinity of marriage in the family. The child is the 2nd issue of his parents. Other sibling is in good health. There is also no history of such illness either in the maternal or paternal side.

On examination, the child was extremely irritable and photophobic. Findings of general physical examination including vital signs were within normal limits except skin lesions. Skin was dry and rough all over the body. There was diffuse brown-black hyperpigmented macules interspersed with hypopigmented macules, particularly abundant over the face, upper part of the trunk and extensor surface of the upper extremities. Few hyperpigmented lesions showed hyperkeratotic change clinically. Hair distribution was normal except the scalp where small areas of hairless skin found due to scarring as a result of itching. Ophthalmologic examination revealed congestion of conjunctivae of both eyes. Eyelids were hyperpigmented up to some extent and there were loss of lashes. On the left eye, there was a bullous lesion of whitish appearance at the sclero-corneal junction. Neurological examination revealed normal deep tendon reflexes and no hearing loss. Developmentally the child was age appropriate.

Complete blood count, peripheral blood film, urine and stool routine examination, liver and renal function tests, chest skiagram and abdominal ultrasound study - all revealed no abnormalities. Biopsy material from skin lesion showed hyperkeratosis, melanin pigmentation in the basal cell layer and elongated rete ridges. Histopathological examination of the bullous lesion revealed features suggestive of squamous cell carcinoma. Genetic studies to pinpoint the exact nature of the defect in our case could not be done due to lack of facility.

Discussion

In the present case, history of consanguinity of marriage is lacking. Handa F et al described a series of four cases and consanguinity had not been observed in those parents of the patients⁷.

The disease usually progresses through 3 stages. The first stage occurs around 6 months after birth. Continued sun exposure will lead to the second stage, which is characterized by poikiloderma. The third stage is the development of solar keratoses and skin cancers¹. In our case, the symptoms appeared at the age of the 6 months of the child. Physical findings of the case were suggestive of third stage of the disease.

In xeroderma pigmentosum patients, eye and neurological problems occur in nearly 80% and 20% respectively¹. Xeroderma pigmentosum under 20 years of age has a greater than 1000 fold increased risk of cutaneous basal cell or squamous cell carcinoma or malignant melanoma³. The mean age for skin cancer is 8 years in patients with XP compared to 60 years in the healthy population. Actinic damage occurs between 1 and 2 years of age². Our patient had developed skin lesions and eye problems (photophobia and squamous cell carcinoma at the limbus of left eye). A case was described by Udagani MM and Govekar VG having squamous cell carcinoma at the limbus with xeroderma pigmentosum⁸. This may be an incidental phenomenon.

Conclusion

As multiple cutaneous neoplasms develop in persons with XP at a young age, early diagnosis and management could be life-saving. Genetic counseling should be offered for families at risk. Follow-up care should be geared to educate the patient and the patient's parents about effective sun protection and early recognition of skin cancer.

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