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ORIGINAL ARTICLE

Assessment of incidence of Xeroderma pigmentosum

Richa Chaudhary

Assistant Professor, Department of Dermatology, North Delhi Municipal Corporation Medical College & Hindu Rao Hospital, Delhi, India

ABSTRACT:

Background: Xeroderma pigmentosum (XP) is a rare, inherited genetic disorder characterized by an extreme sensitivity to ultraviolet (UV) rays from sunlight. The present study was conducted to incidence of Xeroderma pigmentosum (XP). **Materials & Methods:** 16 patients with Xeroderma pigmentosum (XP) of both genders were selected. Parameters such as ocular symptoms and neurological symptoms were recorded. **Results:** Out of 16 patients, males were 9 and females were 7. Ocular symptomssuchasphotophobia seen in 12, lid atrophy in 8, keratitis in 10. Neurological symptoms such as microcephaly in 5, mental retardation in 4, spasticity in 9 and deafness in 2 patients. The difference was non- significant (P> 0.05). **Conclusion:** Neurological complaints in Indian xeroderma pigmentosum patients should prompt screening for XPA gene variants. Prenatal diagnostics, genetic counseling, and conclusive diagnosis would all benefit from rapid molecular diagnosis.

Keywords: Neurological, Ocular, Xeroderma pigmentosum

Corresponding author: Richa Chaudhary, Assistant Professor, Department of Dermatology, North Delhi Municipal Corporation Medical College & Hindu Rao Hospital, Delhi, India

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INTRODUCTION

Xeroderma pigmentosum (XP) is a rare, inherited genetic disorder characterized by an extreme sensitivity to ultraviolet (UV) rays from sunlight.[1] This condition primarily affects the skin and eyes, and in severe cases, it can also impact the nervous system.XP is caused by mutations in genes responsible for repairing DNA damage caused by UV light.[2] These genes are part of the nucleotide excision repair (NER) pathway.XP follows an autosomal recessive pattern, meaning a child must inherit two copies of the defective gene (one from each parent) to develop the condition.[3]

The genetic illness known as Xeroderma pigmentosum (XP) is an autosomal recessive genetic disorder of DNA repair that is characterized by higher risk of developing cutaneous neoplasms, including melanoma, basal cell carcinoma, and squamous cell carcinoma, as well as cutaneous and ocular photosensitivity.[4,5] About 25% of XP patients may experience progressive neurological problems, such as deafness, spasticity, and cognitive impairment. Mutations can arise in any of the nine homologous genes, which are XPA, ERCC3(XPB), XPC, ERCC2, DDB2, ERCC4, ERCC5, ERCC1, and POLH1. Nine complementation groups have been identified. The genes XPA (25%) XPC (25%) POLH1 (21%) and XPD (15%) are the most often mutated.[6]

Symptoms included extreme sun sensitivity, early and excessive freckling on sun-exposed areas, dryness and scaling, high risk of developing skin cancers (basal cell carcinoma, squamous cell carcinoma, and melanoma) at a young age, sensitivity to light, chronic inflammation of the conjunctiva, inflammation of the cornea, increased risk of cancers on the surface of the eyes, progressive neurological degeneration in some patients, leading to hearing loss, poor coordination, intellectual decline, and seizures.[7,8]The present study was conducted to incidence of Xeroderma pigmentosum (XP).

MATERIALS & METHODS

The present study was conducted on 16 patients with Xeroderma pigmentosum (XP)of both genders. All were informed regarding the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. Parameters such as ocular symptoms and neurological symptoms were recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 16		
Gender	**Males**	**Females**
Number	9	7

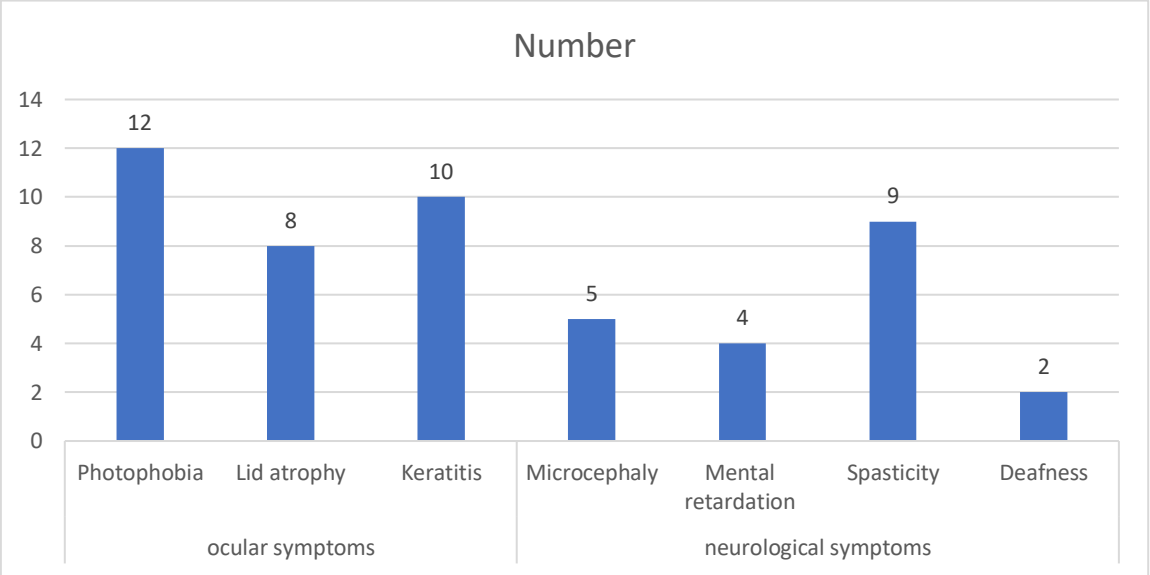
Table I shows that out of 16 patients, males were 9 and females were 7.

Table II Assessment of parameters

Parameters	Variables	Number	P value
ocular symptoms	Photophobia	12	0.74
	Lid atrophy	8	
	Keratitis	10	
neurological symptoms	Microcephaly	5	0.82
	Mental retardation	4	
	Spasticity	9	
	Deafness	2	

Table II shows that ocular symptoms such as photophobia seen in 12, lid atrophy in 8, keratitis in 10. Neurological symptoms such as microcephaly in 5, mental retardation in 4, spasticity in 9 and deafness in 2 patients. The difference was non- significant (P> 0.05).

Graph I Assessment of parameters



DISCUSSION

The physical characteristics of Xeroderma pigmentosum/Cockayne syndrome (XP/CS), which include sunken eyes, thinning skin and hair, and a hunched posture when standing, can be used to distinguish it from XP.[9] These patients may have ataxia, pigmentary retinopathy, and cataracts. It is also necessary to differentiate between XP and Cerebrooculofacial Syndrome (COFS).[10] COFS is characterized by a lack of growth, microcephaly with intracranial calcifications, microcornea, cataracts, optic atrophy, and congenital joint contractures.[11] On the other hand, XP shares some characteristics with COFS, such as xerosis, poikiloderma, atrophy, and telangiectasia.Individuals with XP have a dramatically increased risk of developing skin cancers at a young age.[12] Early diagnosis and stringent sun protection measures can help manage and reduce this risk.Varies widely depending on the severity of the condition and the effectiveness of preventive measures. Early and continuous protection from UV radiation is crucial for improving quality of life and lifespan.[13]The present study was conducted to incidence of Xeroderma pigmentosum (XP).

We found thatout of 16 patients, males were 9 and females were 7. Ocular symptoms such as photophobia seen in 12, lid atrophy in 8, keratitis in 10. Tamhakar et al[14]studied the clinical profile of patients with xeroderma pigmentosum. Ten families with 13 patients with XP. Homozygous mutations in the XPA gene were seen in patients with moderate to severe mental retardation (6/10 families) but not in those without neurological features. Two unrelated families with a common family name and belonging to the same community from Maharashtra were found to have an identical mutation in the XPA gene, namely c.335_338delTTATinsCATAAGAAA (p.F112SfsX2). Testing of the XPC gene in two families with four affected children led to the identification of the novel mutations c.1243C>T or p.R415X and c.1677C>A or p.Y559X. In two families, mutations could not be identified in XPA, XPB and XPC genes.

We observed that neurological symptoms such as microcephaly in 5, mental retardation in 4, spasticity in 9 and deafness in 2 patients.Soufir et al[15]examined the role of XP genes in 86 XP patients from 66 unrelated families, the majority of them were consanguineous and were from the Maghreb. Sequencing analysis was carried out either directly on 44 probands or after 22 families' XP gene had been previously identified using a complementation assay.

56/66 and 8/66 probands, respectively, had XPC and XPA mutations. Surprisingly, 87% of XP-C patients had the same homozygous frameshift mutation, c.1643_1644delTG (p.Val548AlafsX25). A widespread founder effect for this mutation in the Mediterranean region was revealed by haplotype analysis, and its estimated age is 1,250 years or 50 generations. They discovered the previously described nonsense homozygous XPA mutation (p.Arg228X) in 7/8 XP-A patients. Additionally, six mutations were found—five in XPC and one in XPA—that had, as far as we know, never before been reported.

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that neurological complaints in Indian xeroderma pigmentosum patients should prompt screening for XPA gene variants. Prenatal diagnostics, genetic counseling, and conclusive diagnosis would all benefit from rapid molecular diagnosis.

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