Comunicação

High incidence of Xeroderma Pigmentosum in a countryside community in the state of Goiás, Brazil

Alta incidência de Xeroderma Pigmentosum em comunidade no interior de Goiás

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ABSTRACT

We describe a settlement in the Araras District in central Brazil that presents a high incidence of Xeroderma Pigmentosum. Twenty patients have had clinical diagnoses compatible with this condition so far. Reports from surviving relatives suggest an additional 20 deaths linked to typical Xeroderma Pigmentosum symptoms. This is possibly the first report of its kind in the literature, due to the extension of the family factor prevalence, the patients' age range and different characteristics of the clinical manifestations.

Keywords: xeroderma pigmentosum;skin neoplasms; genetics; epidemiology.

RESUMO

Relata-se a identificação de um povoado, o distrito de Araras, no município de Faina, a 242km de Goiânia, Brasil, que apresenta alta frequência de habitantes portadores de Xeroderma Pigmentosum. Concluiu-se diagnóstico clínico compatível com essa doença em 20 pacientes até o momento. Os relatos dos familiares, porém indicam cerca de outras duas dezenas de óbitos decorrentes de sintomas característicos de Xeroderma Pigmentosum. Trata-se possivelmente de relato sem precedentes na literatura em razão da extensão da prevalência familiar, da variação de idade dos pacientes e das diferentes características das manifestações clínicas.

Palavras-chave: *xeroderma pigmentoso; neoplasias cutâneas; genética; epidemiologia.*

COMMUNICATION

Xeroderma Pigmentosum (XP) is rare recessive autosomal inherited condition characterized by a high sensitivity to sunlight. The early appearance of skin tumors – with a frequency 1,000 times higher than average, which causes a significant reduction in life expectancy – is one of its main clinical characteristics. XP patients also present diverse clinical manifestations – such as neurological complications, redness of the eyes, hearing loss, development abnormalities and early aging in some organs (such as the skin). [1]

The molecular cause of XP was identified when it was demonstrated that patients' cells presented reduced levels of repaired DNA synthesis;[2] their skin cells are highly sensitive to ultraviolet (UV) light and present high mutagenicity levels after irradiation. Thus there is a strong correlation between cellular phenotype and genetic instability, which must cause skin tumors

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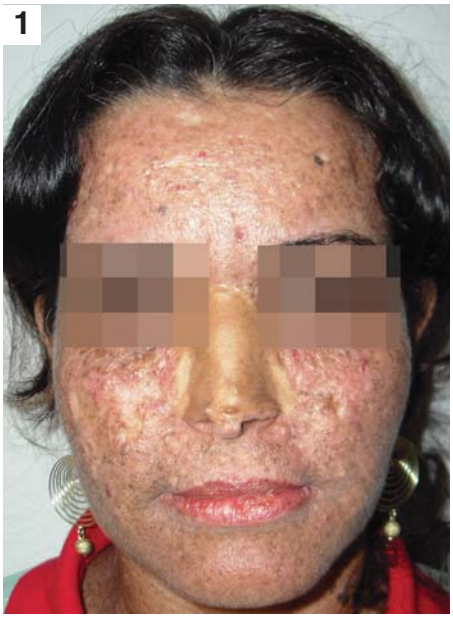
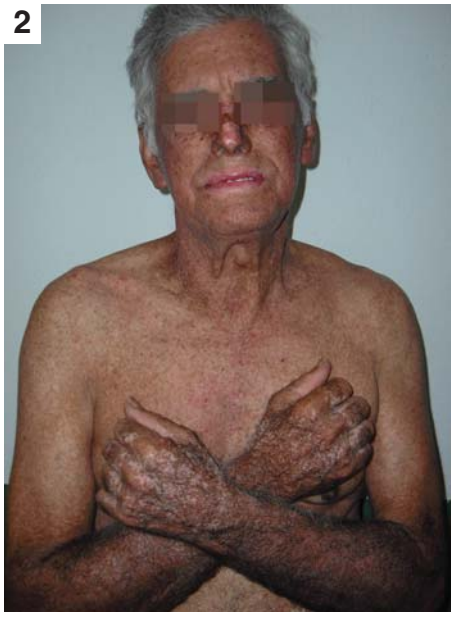
to develop in XP patients. In most XP patients, such cellular phenotypes are caused by the cells' incapacity to remove DNA UV-induced lesions, due to genetic flaws in the DNA repair mechanism known as nucleotide excision repair. Some patients have a normal repair mechanism, yet have problems in the replication of damaged DNA; such cases are known as XP variants.

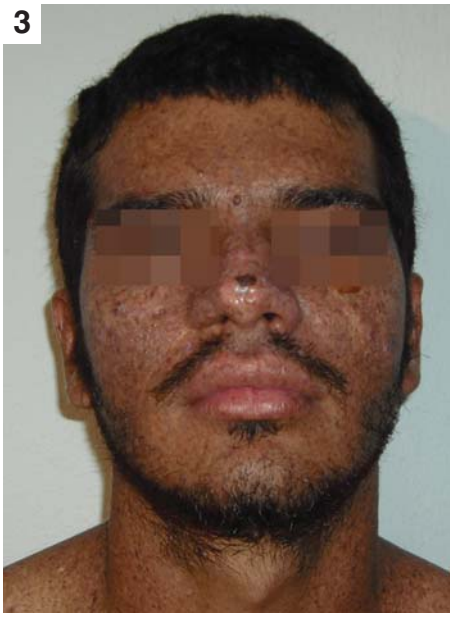
From a genotypic point of view, XP clinical manifestations are accompanied by an equally polymorphic variation. Seven groups, classified as XPA to XPG, represent individual repair genes; the XP variant type is known as XPV.[3,4] While less severe – with a better prognosis and longer life expectancy – XPV presents similar clinical characteristics to other XP types.

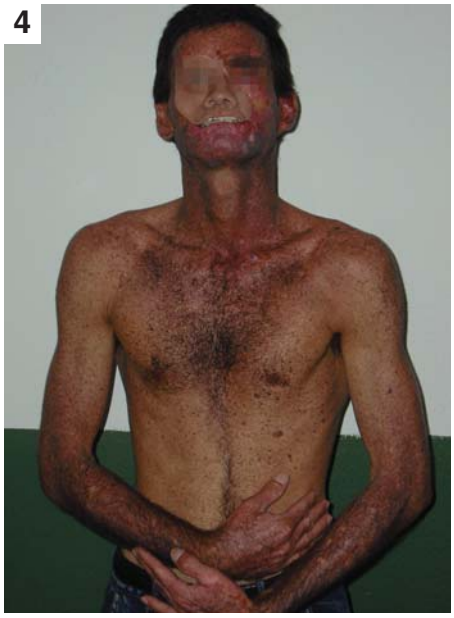
In spite of the syndrome's high genetic diversity, the Araras case suggests that XPV is characterized by a defect in the post-replication repair of DNA. The mutated gene is identified by a culture of the patients' cells, which confirms a clinical diagnosis of the condition. A 5-year-old red-haired male child was examined in 2007, presenting with ephelides in the face. The patient returned in 2009 for a consultation, and was diagnosed with probable XP. In a 2010 field visit to Araras, a city of about 1,000 where the child and his family live, 20 new cases compatible with XP were identified. According to residents' reports, more than 30 other individuals have died with symptoms typical of the disorder in the last few decades.

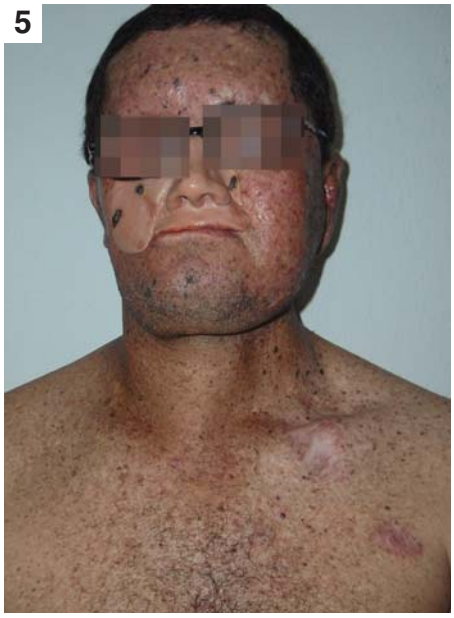
In addition to the patients identified in Araras, there are reports of individuals with typical XP symptoms in neighboring cities. The literature describes a second group with XP: approximately 10 Indians from Guatemala with serious symptoms who died before 10 years of age.[5] The study of the Araras group will certainly bring many advances in the understanding of the dis-











Figures 1 to 5 - Xeroderma Pigmentosum patients living in the city of Faina, State of Goiás, Brazil

Tabela 1: Epidemiologic data of XP patients from the city of Faina

Patient	Age	Gender	Profession	Ancestors
1	76	M	Agricultural worker	Father died of symptoms typical of XP
2	74	M	Agricultural worker	Only XP patient from 8 siblings. Aunt died of symptoms typical of XP
3	72	M	Agricultural worker	Brother has XP
4	61	F	Housewife	4 children with XP, 3 healthy children
5	60	F	Housewife	Father has XP, 3 siblings died with symptoms typical of XP, 3 healthy children
6	54	F	Agricultural worker	Father has XP
7	52	M	Agricultural worker	Healthy children
8	52	M	Agricultural worker	n.a.
9	40	M	Retired	n.a.
10	36	F	Housewife	2 healthy children. Parents' siblings have XP
11	35	M	Agricultural worker	Parents with XP
12	32	F	Housewife	3 siblings with XP, 2 healthy children
13	31	M	Agricultural worker	n.a.
14	29	F	Housewife	One sister with XP
15	28	M	auto mechanic	n.a.
16	26	M	Agricultural worker	Father has XP
17	17	M	Student	n.a.
18	n.a.	M	Agricultural worker	XP patients on both sides of the family. 3 siblings had XP, one died with XP symptons. 2 children apparently free of XP
19	12	M	Student	Paternal grandfather has XP
20	8	M	Student	n.a.

order, due to the extension of the prevalence in the patient's extended family, the patients' age range, and different characteristics of clinical manifestation (Figures 1-5).

Although it is rare for XP patients to reach an advanced age, some in the Araras group (age range 8-76) are elderly, with serious lesions (Table 1). Most patients are of Caucasian origin, however three were identified as having black ancestors. Despite the high frequency of individuals with XP clinical symptoms, it was only recently that the characteristics described by the term "xeroderma" were recognized among them. The initial care consists of the removal of tumors. The dermatologic follow-up must include periodic control, protection against the sun and other elements. and treatment of premalignant and malignant lesions. Medical care must also include multidisciplinary specialists: genetic, ophthalmologic, neurological, oncologic, psychological and social assistance. ●

REFERÊNCES

1. Cleaver JE. Historical aspects of *xeroderma pigmentosum* and nucleotide excision repair. Adv Exp Med Biol. 2008;637:1-9.
2. Cleaver JE. Defective repair replication of DNA in xeroderma pigmentosum. Nature. 1968; 218(5142): 652-6.
3. Costa RMV. Chigancas S, Galhardo RH. Carvalho, Menck CF The eukaryotic nucleotide excision repair pathway. Biochimie. 2003;85(11):1083-99.
4. Armelini MG, Lima-Bessa KM, Marchetto MC, Muotri AR, Chiganças V, Leite RA , et al. Exploring DNA damage responses in human cells with recombinant adenoviral vectors." Hum Exp Toxicol. 2007;26(11):899-906.
5. Cleaver JE, Feeney L, Tang JY, Tuttle P. *Xeroderma pigmentosum* group C in an isolated region of Guatemala. J Invest Dermatol. 2007;127(2):493-6.