PREVALENCE OF *CEREBROTENDINOUS XANTHOMATOSIS* IN JUVENILE CATARACT CASES IN TURKEY; A RETROSPECTIVE AND PROSPECTIVE OBSERVATIONAL STUDY, GEN-EYE I

Atilla, Huban[1], Coskun, Turgay[2], Elibol, Bulent[3], Altinel, Serdar[4], Ozdilsiz, Belgin[5], GENEYE-1 Working Group[6]

[1] Ankara University, Faculty of Medicine, Department of Ophthalmology, 06100, Ankara, Turkey. [2] Hacettepe University, Faculty of Medicine, Department of Peadiatric Metabolism, 06100, Ankara, Turkey. [3] Hacettepe University, Faculty of Medicine, Department of Neurology, 06100, Ankara, Turkey. [4] TRPHARM A.S., Clinical Trial Department, 34394, Istanbul, Turkey. [5] TRPHARM A.S., Medical Department, 34394, Istanbul, Turkey. (6) GENEYE-1 Working Group: Selahattin Ugur Keklikci, Cagla Cilem Han, Elif Demirkilinc Biler, Onder Uretmen, Sabit Kimyon, Kıvanc Gungor, Elvan Yalcin, Halil Ibrahim Altinsoy, Ayşe Ayca Sari, Fatih Mehmet Mutlu, Onder Ayyildiz, Cigdem Ulku Can, Sibel Polat, Aylin Yaman, Tulin Berk, Yusuf Ayaz, Iclal Yucel, Pınar Bingöl Kiziltunc, Yusuf Yildirim, Tekin Yasar, Hikmet Basmak, Ahmet Tuncer Ozmen, Halil Ibrahim Imamoglu, Soner Demirel, Nihan Aksu Ceylan, Nilufer Gozum, Elif Erdem, Meltem Yagmur, Sibel Kocabeyoglu, Sibel Kadayıfcilar, Murat Irkec, Eren Cerman, Ebru Toker, Mustafa Atas.

INTRODUCTION

Cerebrotendinous xantomatosis (CTX) is an autosomal recessive inherited disease. In CTX, sterol 27-hydroxylase enzyme activity is defective in the first step of cholesterol side chain oxidation (1). As a result of the mutations in the CYP27A1 gene, cholestanol in the plasma and tissues increased. The cause of symptoms and findings in CTX like bilateral juvenile cataracts (BJC), tendon xanthomas and central nervous system damages are as a result of the accumulation of deposits of cholesterol and cholestanol (a derivative of cholesterol) in various tissues (1,2). The prevalence of CTX is estimated to be 1/50.000 in general population (3). BJC has been reported in 88% of CTX cases (3). Prevalence of CTX in BJC cases is unknown. Pre-screening of CTX can be done by Mignarri scoring test and by simply evaluating cholestanol levels (should be ≤ 3.75 mg/L) in the plasma of suspected cases (4). The definitive diagnosis of the disease is made by showing the CYP27A1 gene mutation (5). The disease is usually diagnosed after the age of 30 years when usually central nervous system damage occurs (4). Early diagnosis and early treatment before the development of neurological signs and symptoms were found to stop the progression of the disease (6). We aimed to evaluate prevalence of CTX in juvenile cataract cases in ophthalmology clinics of Turkey for the first time.

METHODS

In the retrospective part of this observational study, we have screened patient databases and/or patient files in the archives of ophthalmology clinics. In the prospective part, we have invited these patients who had BJC operations to the study centres. Patients who agreed to participate in the study were enrolled to the study. All volunteers were answered Mignarri Scoring Test; and a blood sample was withdrawn for cholestanol testing at central laboratory. Volunteers who have cholestanol levels higher than 3.75 mg/L in the plasma were reviewed by Scientific Advisory Committee and referred to Pediatric Metabolism clinics for genetic confirmation testing.

RESULTS

A total of 279 volunteers (above 1 years of age) were enrolled to the study between June 2018 and April 2019. Twenty-one patients (n=21; 7.53%) out of 279 have cholestenol levels above the threshold of 3.75 mg/L. Four BJC patients (n=4; 19.04 %) out of 21 were diagnosed as CTX genetically confirmed). Other parameters of these cases (Mignarri scores etc.) will be analysed statistically. Relatives of these index cases are included in CTX genetic screening programme.

CONCLUSION

This is the first study known to screen CTX disease in BJC patients. In patients with BJC, CTX may be one of the background pathologies. Cholestanol testing by the suspicion of ophthalmologists will help patients to be diagnosed and treated as early as possible which will save their lives. The study is planned to continue with increasing number of BJC patients to be enrolled in CTX screening programme.

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