Usher’s syndrome: Can primarily be a primary ciliary disorder?

Sir,

Usher’s syndrome is a genetically heterogeneous disorder. It mainly consists of auditory and visual disturbances. Manifestations include sensory neural hearing loss, vestibular system involvement and progressive loss of vision due to retinitis pigmentosa. Primary ciliary disorder is a hereditary condition that affects the structure and function of cilia. Bronchiectasis can be due to various conditions, primary ciliary disorder is one of them. Here we would like to present a rare case of Usher’s syndrome that had clinical and radiological features of bronchiectasis, thereby opening avenues to suggest a possible link between Usher’s syndrome and primary ciliary disorder.

A 20-year-old male patient symptomatic since childhood was presented with history of postural dependant cough with copious expectoration and recurrent rhinosinusitis. For these complaints he had received multiple courses of empirical antituberculous therapy and operated for left lower lobectomy in the past. Further history-taking elicited a progressive loss of vision and hearing with scholastic backwardness. The patient was born of non-consanguineous marriage without any significant family history. Clinical examination and chest radiograph suggested bronchiectasis. Routine blood and biochemistry parameters were normal. High resolution computed tomography-HRCT [Figure 1a and b] confirmed the presence of bronchiectasis in the right middle lobe and lingula with left lower lobectomy status. Audiometry reported bilateral moderately severe mixed hearing loss with normal vestibular function. Ophthalmologic evaluation revealed retinitis pigmentosa [Figure 2]. Mental testing showed social quotient of 38 suggesting moderate retardation in social maturity.

On the basis of clinical history, chest radiography, audiometry and ophthalmoscopy findings patient was diagnosed as a case of Usher syndrome (Type II or III) with bronchiectasis.

Usher syndrome is an autosomal recessive disease characterized by congenital deafness, involvement of the vestibular system, and progressive visual loss owing to retinitis pigmentosa. It is also known as Hallgren syndrome, Usher-Hallgren syndrome, Retinitis pigmentosa-dysacusis syndrome and Dystrophia retinae dysacusis syndrome. It was first described by Von Graefe[1] in 1858 but Usher[2] was the first to recognize its hereditary nature in his report of 41 families in 1914. It is considered to be the most common cause of congenital deaf-blindness. It was further divided by Davenport and Omenn into three clinical sub-types Usher type I (USH1), Usher type II (USH2) and Usher type III (USH3) in order of decreasing severity of deafness and involvement of the vestibular system.[3] Vestibular function is absent in USH1 and normal in USH2 and USH3. Differential diagnoses include Alport syndrome, Bardet-Biedl syndrome, Friedreich ataxia, Hurler syndrome, Kearns-Sayre syndrome, Refsum’s disease.

In addition to congenital deaf-blindness our patient also had bronchiectasis, recurrent rhinosinusitis. Very few cases have been reported in the literature suggesting an association between bronchiectasis, rhinosinusitis and Usher syndrome. Bronchiectasis has been first reported in siblings suffering from USH1.[4] Later impaired nasal ciliary beat frequency with no clinical consequences was demonstrated on nasal mucosal brush biopsy in four cases of USH2.[5] Our case is USH2/USH3 with presence of bronchiectasis. In these cases defective development of both the immotile (present in ear and eye) and motile (present in the respiratory epithelium) cilia has been hypothesized. The combined involvement of three sensory systems in Usher can be explained by the shared origin of photoreceptors, the auditory and vestibular hair cells from ciliated progenitor cells.[6] The ultrastructurally defective cilia in the respiratory...
tract cause impaired mucociliary clearance leading to repeated infections and bronchiectasis as is seen in primary ciliary dyskinesia. This association suggests that Usher syndrome could be a primary ciliary disorder.

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