BANGLADESH J CHILD HEALTH 2008; VOL 32 (1) : 33-36

Treacher Collins Syndrome - A Case Report

FARZANA ISLAM[1], AINUN AFROZA[2], MD. RUKUNUZZAMAN[3], ATIAR RAHMAN[4], SHARIFUL HASSAN[5]

Introduction

Treacher Collins Syndrome, also known as Mandibulofacial dysostosis, is a rare genetic disorder characterized by craniofacial deformities[1]. In 1900, a British ophthalmologist named Edward Treacher Collins first described this birth defect[2]. It is estimated that Treacher Collins Syndrome occurs in 1 out of 50,000 births[3]. There is no convincing data available regarding the prevalence of the disease in Bangladesh. It is an autosomal dominant disorder[4]. About 60 percent of such cases result from new mutations in the Treacher Collins Syndrome gene (TCOF1) at chromosome 5q32-q33.1[5]. This gene encodes a nucleolar protein named treacle which is involved in ribosomal DNA gene transcription through its interaction with upstream binding factor (UBF)[6]. This protein is active during early embryonic development in structures that become bones and other tissues on the face. Mutations in the TCOF1 gene reduce the amount of treacle that is produced in cells and develops a disorder which includes abnormal craniofacial development[7].

The symptoms of this disorder vary greatly, ranging from almost unnoticeable to severe. Most affected patients have underdeveloped facial bones, which result in a sunken appearance in the middle of the face, a prominent nose, and a very small jaw and chin (micrognathia). Some children with this condition are also born with a cleft palate[8]. In severe cases, underdevelopment of the facial bones may restrict an affected infant's airway, causing potentially life-threatening respiratory problems. People with Treacher Collins Syndrome often have eyes that slant downward, sparse eyelashes, and a notch in the lower eyelids called coloboma[9,10]. This condition is also characterized by absent, small, or unusually developed ears (microtia). Defects in the middle ear (which contains three small bones that transmit sound) cause hearing loss in about half of cases[11].

Diagnosis of Treacher Collins Syndrome is based on the clinical signs and symtoms. A geneticist can determine whether or not the syndrome was inherited[12].

Case Report

A 4 months 15 days old male baby born to a nonconsanguinous parents was presented to us in the department of Paediatric Gastroenterology and Nutrition of Bangabandhu Sheikh Mujib Medical University with the complaints of recurrent cough and cold, feeding difficulties and unsatisfactory growth since birth. He had no significant family history. He was delivered at home at term with delayed cry. His milestones of development were age appropriate except hearing as he never turned head to side from which sounds came. He was never breast fed due to difficulty in swallowing. He was not immunized. The patient was found ill looking, mildly pale, dyspneic. His anterior fontanelle was found open. There were multiple congenital anomalies with microcephaly. The child had bilateral microtia. There were multiple facial dysmorphism including downward-slanting eyes, malar hypoplasia, mandibular hypoplasia (micrognathia) and a large fishlike mouth. He also had pectus carinatum and chest indrawing. Breath sound was vesicular with prolong expiration. Crepitation and ronchi were present in both lungs. The abdomen was scaphoid. Liver and spleen were not palpable. He was severely under weight (Weight for age Z score - 4.1), severely wasted (Weight for hight Z score - 3.5) and severely stunted (Height for age Z score - 3.3). Peripheral blood count was essentially normal except moderate anemia (hemoglobin 8.45 gm/dl). Serum Electrolytes were within normal limit. X-ray chest showed consolidation at the mid zone of the right lung. Eye findings included coloboma and absent puncta on lower eye lids. There was constant epiphora due to atresia of lacrimal duct. Paediatric Otolaryngologists found total hearing loss.

1. Medical Officer, Dept. of Paediatric Gastroenterology & Nutrition, Bangabandhu Sheikh Mujib Medical University, Shahabag, Dhaka, Bangladesh
2. Chairman & Head, Dept. of Paediatric Gastroenterology & Nutrition, Bangabandhu Sheikh Mujib Medical University, Shahabag, Dhaka, Bangladesh
3. Assistant Professor, Dept. of Paediatric Gastroenterology & Nutrition, Bangabandhu Sheikh Mujib Medical University, Shahabag, Dhaka, Bangladesh
4. Assistant Professor, Dept. of Paediatric Gastroenterology & Nutrition, Sheikh Mujib Medical University, Shahabag, Dhaka, Bangladesh
5. Medical Officer, Dept. of Paediatric Gastroenterology & Nutrition, Sheikh Mujib Medical University, Shahabag, Dhaka, Bangladesh

Correspondence : Dr. Farzana Islam

The baby was diagnosed as a case of Treacher Collins Syndrome on the basis of clinical features as stated before.

The patient was managed with nutritional support through nago-gastric tube feeding, vitamins, micronutrients, parenteral antibiotics and eye drops. Nebulization with salbutamol solution was done. The patient started gaining weight after 5 days of nago-gastric tube feeding. On the 10th day of admission, oral feeding was attempted, but the baby aspirated. After resuscitations, nago-gastric feeding was restarted. Oral feeding was introduced simultaneously with each tube feeding which was also increased gradually. After 18 days of admission, the patient was totally on oral feed. His respiratory distress subsided and weight gain was found to be satisfactory. The patient was discharged after 34 days. During discharge, necessary counseling was done with an advise for a regular follow up for further treatment of hearing loss and reconstructive surgery of facial anomalies.

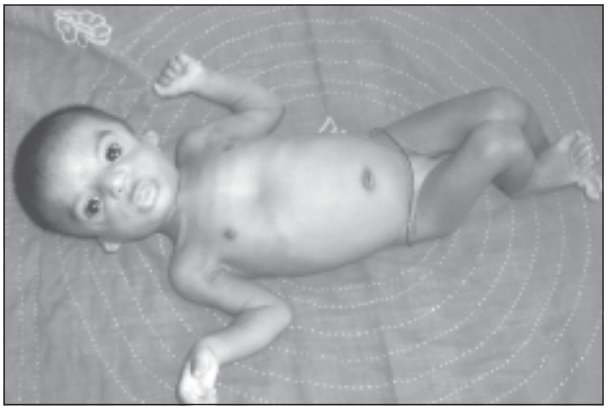

Fig.-1: *Microcephaly, pectus carinatum*

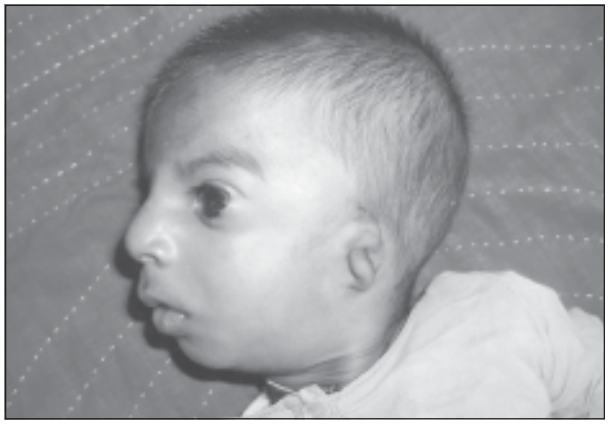

Fig.-2: *Microtia*

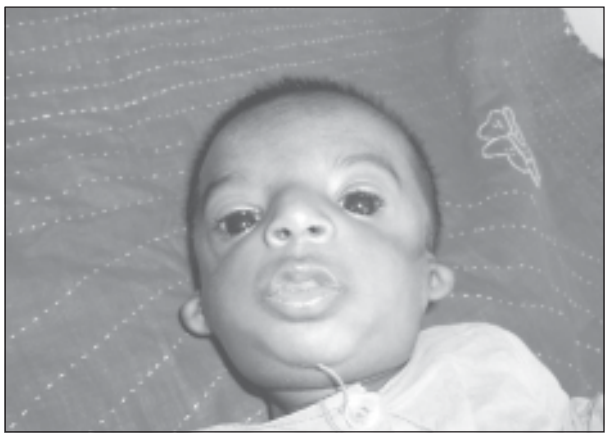

Fig.-3: *Downward-slanting eyes, malar hypoplasia, mandibular hypoplasia (micrognathia) and a large fishlike mouth*

Fig.-4: *Mother and her baby with Treacher Collins Syndrome*

Discussion

Treacher Collins Syndrome is a highly complex disease. It is characterized by hypoplasia of the facial bones, especially the zygoma and the mandible. Facial clefting causes this hypoplastic appearance, with possible deformities or deficiencies of the ear, orbital, midface, and lower jaw regions[11,12]. The clinical appearance is a result of the zygoma (malar bone) failing to fuse with the maxilla, frontal, and temporal bones. Highly variant degrees of involvement (complete, incomplete, and abortive forms) can be seen, but common facial features may include: hypoplastic cheeks, zygomatic arches and mandible; microtia with possible hearing loss; high arched or cleft palate; macrostomia (abnormally large mouth); anti-mongoloid slant to the eyes; colobomas; increased anterior facial height; malocclusion (anterior open bite); small oral cavity and airway with a normal-

sized tongue; pointed nasal prominence. People with Treacher Collins Syndrome usually have normal intelligence[12].

Treatment of this condition is lengthy and requires a multidisciplinary approach focused on treatment of symptoms. Patients with severe manifestations in which airway inadequacy is the prominent feature after birth, a tracheostomy is performed (and may remain for several years, until the lower jaw has sufficiently grown or until alveolar distraction is performed to enable passage of air through the oral cavity). Hearing aids are important for the development of the infant's communication skills and for the normal bonding process within the family. Surgical intervention for the patients of Treacher Collins Syndrome is based upon the anatomic deformities and corrected according to physiologic need and development [13].

The case reported here was certainly a severe variation of Treacher Collins Syndrome. There were multiple congenital anomalies. The child had bilateral microtia, multiple facial dysmorphism including downward-slanting eyes, malar hypoplasia, mandibular hypoplasia (micrognathia), a large fishlike mouth. Opthalmological findings included coloboma and absent puncta on lower eye lids. There was constant epiphora due to atresia of lacrimal duct. Similar finding have been reported by other investigators[14]. Paediatric Otolaryngologist found total hearing loss. Similar finding was also reported by Hertle RW[15].

As the patient had no history of such type of disorders in his family, the case can be taken as a new mutation. Therefore, it is unlikely that, the next siblings of the family would be affected.

Each and every case of Treacher Collins Syndrome is unique and needs to be assessed individually. Both the oral cavity (mouth) and the air passage (nose and throat) tend to be small in patients who have this syndrome. This may produce severe problems for the affected infants with breathing and feeding. Some children who have severe breathing difficulties require an operation to improve breathing and/or feeding. On the other hand, its psychological and social effects are devastating due to facial malformations. Therefore, it is imperative, that all dimensions of the syndrome must be given equal attention for appropriate treatment. In fact many features of the disease can be improved by surgery and other supportive treatments[15]. A well-planned treatment can produce excellent results for complete restoration of the forms and functions of the patient, enabling the individual to adapt to a "normal" way of life.

References

1. A Franceschetti, D Klein. The mandibulo-facial dysostosis. A new hereditary syndrome. Acta Ophthalmologica J Craniofacial Surg 1949; 27: 143-224.
2. Edwards SJ, Gladwin AJ, Dixon MJ. The mutational spectrum in Treacher Collins syndrome reveals a predominance of mutations that create a prematuretermination codon. Am J Hum Genet 1997; 60: 515-24.
3. Scriver CR. The metabolic & molecular bases of inherited disease. Am J Pathol 2008; 173: 301-10.
4. Dixon J, Jones NC, Sandell LL. Tcof1/Treacle is required for neural crest cell formation and proliferation deficiencies that cause craniofacial abnormalities. Proc Natl Acad Sci USA 2006; 103: 13403-08.
5. Valdez BC, Henning D, So RB, Dixon J, Dixon MJ. The Treacher Collins syndrome (TCOF1) gene product is involved in ribosomal DNA gene transcription by interacting with upstream binding factor. Proc Natl Acad Sci USA 101: 179-81.
6. Taber OA, Gillessen-Kaesbach G, Albert A. Genotyping in 46 patients with tentative diagnosis of Treacher Collins syndrome revealed unixpected phenotype varition. Eur J Hum Genet 2004; 12: 879-90.
7. Dixon MJ, Marres HA, Edwards SJ, Dixon J. Treacher Collins Syndrome: correlation between clinical and genetic linkage studies. J Formos Med Assoc 2006; 105: 518-21.
8. Cohen MM Jr, Rollnick BR, Kaye CI. Oculoauriculovertebral spectrum: an updated Critique on Cleft Palate. J Appl Genet 1989; 26: 276-86.
9. Berry GA. Note on a congenital defect (coloboma?) of the lower lid. Royal Lond Ophthalmol Hosp Rep 1889; 12: 255-57.

10. Collins ET. Cases with symmetrical congenital notches in the outer part of each lower lid and defective development of the malar bones. Arch Otolaryngol Head Neck Surg 1995; 121: 509-14.

11. Thomson A. Notice of several cases of malformation of the external ear, together with experiments on the state of hearing in such persons. London and Edinburgh Monthly Journal of Medical Science 1998; 7: 1846-47.

12. Posnick JC, Ruiz RL. Treacher Collins syndrome: current evaluation, treatment, and future directions. Cleft Palate Craniofac J 2000; 37: 434.

13. Moore MH, Guzman-Stein G, Proudman TW. Mandibular lengthening by distraction for airway obstruction in Treacher-Collins syndrome. J Craniofacial Surg 1994; 5: 22-25.

14. Marszalek B, Wojcicki P, Kobus K, Trzeciak WH. Clinical features, treatment and genetic background of Treacher Collins syndrome. J Appl Genet 2002; 43: 223-33.

15. Hertle RW, Ziylan S, Katowitz JA. Ophthalmic features and visual prognosis in the Treacher-Collins syndrome. Br J Ophthalmol 1993; 77: 642-45.