Ehlers-Danlos Syndrome Type 1

Alternative Names
Ehlers-Danlos Syndrome, Severe Classic Type
EDS I
EDS1
Ehlers-Danlos Syndrome, Gravis Type

Record Category
Disease phenotype

WHO-ICD
Congenital malformations, deformations and chromosomal abnormalities > Congenital malformations and deformations of the musculoskeletal system

Incidence per 100,000 Live Births
2-5

OMIM Number
130000

Mode of Inheritance
Autosomal dominant

Gene Map Locus
2q32.2, 9q34.3, 17q21.33

Description
Ehlers-Danlos syndrome (EDS) is a group of more than 10 different hereditary disorders caused by disruptions in either the synthesis or processing of collagen. The disorders are, therefore, characterized by dislocation, pain and increased hypermobility of joints, stretched, soft and velvety skin that is susceptible to bruising, easy scarring and poor wound healing, and vision problems.

The most common types of EDS are EDS I and EDS II, the classical types; both types show an autosomal dominant pattern. EDS I (Gravis type) characterized by hyperextensibility, abnormal wound healing, atrophic scars, and complications of joint hypermobility such as: dislocations, subluxations and *pes planus*. Other features include muscular hypotonia and delayed motor development.

The diagnosis of EDS I is established by family history and clinical examination, hyperextensibility should be tested at a neutral site, also joint hypermobility should be assessed using the Beighton scale. Specific diagnostic tests are available for some types of EDS in which there is a known biochemical defect.

EDS I treatments vary depending on how EDS affects the patients. Physiotherapy may benefit the children with hypotonia and delayed motor development. Non-weight-bearing exercise promotes muscle strength and coordination. Anti-inflammatory drugs may alleviate joint pain. Wounds need to be closed without tension. To prevent the primary manifestations, children with skin fragility can wear pads, bandages, or ski stockings with shin padding over the forehead, knees, and shins to avoid skin tears. Taking ascorbic acid (vitamin C) may reduce bruising. Since patients have an increased risk for developing a mitral valve prolapse, a heart ultrasound is also recommended for patients.

EDS Type I is a fairly non-serious disorder. Most patients have a normal life span and intelligence. Pregnancy, however, may be complicated, due to the skin problems. The incidence rate for this syndrome is less than 1 in 20,000.

Molecular Genetics
About 50% of the cases of classical EDS are caused by mutations in the COL5A1 or COL5A2 genes. Few mutations in the COL4A1 gene have been reported in EDS I patients: A four base pair deletion +3 to +6 in intron 65 which causes a 234-bp deletion of exon 65 in the processed mRNA; A G>T transversion which results in a cysteine1181serine mutation; a splice mutation caused by deletion of exon 42 and resulting in loss of 100 bp; and a compound heterozygosity for a gly1489-to-glu (p.G1489E) mutation and a gly530-to-ser (p.G530S) mutation. Two mutations have been identified in the COL5A2 gene in EDS I patients, a 54-bp deletion resulted in removing 18

amino acids, gly430 to pro447, from the triple helical domain of the alpha-2(V) chain. And a +1 heterozygous deletion of 54 bp, removing 18 amino acids from the triple helical domain of the alpha-2(V) chain.

Collagen 1 is the most abundant collagen in the body, and is present in scar tissues, tendons, skin, artery walls, myofibrils, fibrocartilage, and bones and teeth, whereas collagen 5 is associated with collagen 1, but is mainly seen in the placenta. Thus, it is clear to see how mutations in these genes could lead to the clinical features noticed in EDS Type I.

Epidemiology in the Arab World

Madi et al. (2005) investigated 7739 live and still-born babies during the period from January 2000 to December 2001 in Al-Jahara Hospital in Kuwait. Of these, 97 babies suffered from major congenital abnormalities, suggesting an incidence of about 12.5 per 1000 birth. One of the babies was affected with Ehlers-Danlos syndrome type 1.

References

Madi SA, Al-Naggar RL, Al-Awadi SA, Bastaki LA. Profile of major congenital malformations in neonates in Al-Jahra region of Kuwait. East Mediterr Health J. 2005; 11(4):700-6. PMID: 16700386

Related CTGA Records

N/A

External Links

http://emedicine.medscape.com/article/1114004-overview
http://ghr.nlm.nih.gov/condition=ehlersdanlossyndrome
http://www.emedicine.com/PED/topic654.htm
http://www.mayoclinic.com/health/ehlers-danlos-syndrome/DS00706
http://www.medicinenet.com/ehlers-danlos_syndrome/article.htm
http://www.ncbi.nlm.nih.gov/books/NBK1244/
http://www.nlm.nih.gov/MEDLINEPLUS/ency/article/001468.htm

Contributors

Nada Assaf: 6.2.2013
Pratibha Nair: 18.6.2008