Congenital afibrinogenemia

Congenital afibrinogenemia is a bleeding disorder caused by impairment of the blood clotting process. Normally, blood clots protect the body after an injury by sealing off damaged blood vessels and preventing further blood loss. However, bleeding is uncontrolled in people with congenital afibrinogenemia. Newborns with this condition often experience prolonged bleeding from the umbilical cord stump after birth. Nosebleeds (epistaxis) and bleeding from the gums or tongue are common and can occur after minor trauma or in the absence of injury (spontaneous bleeding). Some affected individuals experience bleeding into the spaces between joints (hemarthrosis) or the muscles (hematoma). Rarely, bleeding in the brain or other internal organs occurs, which can be fatal. Women with congenital afibrinogenemia can have abnormally heavy menstrual bleeding (menorrhagia). Without proper treatment, women with this disorder may have difficulty carrying a pregnancy to term, resulting in repeated miscarriages.

Frequency

Congenital afibrinogenemia is a rare condition that occurs in approximately 1 in 1 million newborns.

Causes

Congenital afibrinogenemia results from mutations in one of three genes, \textit{FGA}, \textit{FGB}, or \textit{FGG}. Each of these genes provides instructions for making one part (subunit) of a protein called fibrinogen. This protein is important for blood clot formation (coagulation), which is needed to stop excessive bleeding after injury. In response to injury, fibrinogen is converted to fibrin, the main protein in blood clots. Fibrin proteins attach to each other, forming a stable network that makes up the blood clot.

Congenital afibrinogenemia is caused by a complete absence of fibrinogen protein. Most \textit{FGA}, \textit{FGB}, and \textit{FGG} gene mutations that cause this condition result in a premature stop signal in the instructions for making the respective protein. If any protein is made, it is nonfunctional. When any one subunit is missing, the fibrinogen protein is not assembled, which results in the absence of fibrin. Consequently, blood clots do not form in response to injury, leading to the excessive bleeding seen in people with congenital afibrinogenemia.

Inheritance Pattern

Congenital afibrinogenemia is inherited in an autosomal recessive pattern, which means both copies of the gene in each cell have mutations. The parents of an individual with an autosomal recessive condition each carry one copy of the mutated gene. The
parents have about half the normal level of fibrinogen in their blood but typically do not show signs and symptoms of the condition.

Other Names for This Condition
- afibrinogenemia
- familial afibrinogenemia

Diagnosis & Management

Genetic Testing Information
- What is genetic testing?
  /primer/testing/genetesting
- Genetic Testing Registry: Hereditary factor I deficiency disease

Research Studies from ClinicalTrials.gov
- ClinicalTrials.gov
  https://clinicaltrials.gov/ct2/results?cond=%22afibrinogenemia%22

Additional Information & Resources

Health Information from MedlinePlus
- Encyclopedia: Congenital Afibrinogenemia
  https://medlineplus.gov/ency/article/001313.htm
- Encyclopedia: Fibrinogen
  https://medlineplus.gov/ency/article/003650.htm
- Health Topic: Bleeding Disorders
  https://medlineplus.gov/bleedingdisorders.html

Genetic and Rare Diseases Information Center
- Afibrinogenemia
  https://rarediseases.info.nih.gov/diseases/5761/afibrinogenemia

Educational Resources
- MalaCards: afibrinogenemia, congenital
  https://www.malacards.org/card/afibrinogenemia_congenital
  https://www.merckmanuals.com/home/blood-disorders/blood-clotting-process/how-blood-clots
• Orphanet: Familial afibrinogenemia
  https://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=98880

• World Federation of Hematology: Rare Clotting Factor Deficiencies
  https://elearning.wfh.org/elearning-centres/rare-clotting-factor-deficiencies/

Patient Support and Advocacy Resources

• National Hemophilia Foundation: Factor I Deficiency
  https://www.hemophilia.org/Bleeding-Disorders/Types-of-Bleeding-Disorders/Other-Factor-Deficiencies/Factor-I

• National Organization for Rare Disorders (NORD): Congenital Afibrinogenemia
  https://rarediseases.org/rare-diseases/afibrinogenemia-congenital/

• World Federation of Hematology: Rare Clotting Factor Deficiencies
  https://elearning.wfh.org/elearning-centres/rare-clotting-factor-deficiencies/

Scientific Articles on PubMed

• PubMed
  https://www.ncbi.nlm.nih.gov/pubmed?term=%28Afibrinogenemia%5BMAJR%5D%29+AND+%28afibrinogenemia%5BTIAB%5D%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+1800+days%22%5Bdp%5D

Catalog of Genes and Diseases from OMIM

• AFIBRINOGENEMIA, CONGENITAL
  http://omim.org/entry/202400

Sources for This Summary


  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/11354637

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/16855369

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/15837518

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/23852822

Reprinted from Genetics Home Reference: 

Reviewed: September 2014
Published: June 9, 2020

Lister Hill National Center for Biomedical Communications
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