Giant congenital melanocytic nevus

Giant congenital melanocytic nevus is a skin condition characterized by an abnormally dark, noncancerous skin patch (nevus) that is composed of pigment-producing cells called melanocytes. It is present from birth (congenital) or is noticeable soon after birth. The nevus may be small in infants, but it will usually grow at the same rate the body grows and will eventually be at least 40 cm (15.75 inches) across. The nevus can appear anywhere on the body, but it is more often found on the trunk or limbs. The color ranges from tan to black and can become darker or lighter over time. The surface of a nevus can be flat, rough, raised, thickened, or bumpy; the surface can vary in different regions of the nevus, and it can change over time. The skin of the nevus is often dry and prone to irritation and itching (dermatitis). Excessive hair growth (hypertrichosis) can occur within the nevus. There is often less fat tissue under the skin of the nevus; the skin may appear thinner there than over other areas of the body.

People with giant congenital melanocytic nevus may have more than one nevus (plural: nevi). The other nevi are often smaller than the giant nevus. Affected individuals may have one or two additional nevi or multiple small nevi that are scattered over the skin; these are known as satellite or disseminated nevi.

Affected individuals may feel anxiety or emotional stress due to the impact the nevus may have on their appearance and their health. Children with giant congenital melanocytic nevus can develop emotional or behavior problems.

Some people with giant congenital melanocytic nevus develop a condition called neurocutaneous melanosis, which is the presence of pigment-producing skin cells (melanocytes) in the tissue that covers the brain and spinal cord. These melanocytes may be spread out or grouped together in clusters. Their growth can cause increased pressure in the brain, leading to headache, vomiting, irritability, seizures, and movement problems. Tumors in the brain may also develop.

Individuals with giant congenital melanocytic nevus have an increased risk of developing an aggressive form of cancer called melanoma, which arises from melanocytes. Estimates vary, but it is generally thought that people with giant congenital melanocytic nevus have a 5 to 10 percent lifetime risk of developing melanoma. Melanoma commonly begins in the nevus, but it can develop when melanocytes that invade other tissues, such as those in the brain and spinal cord, become cancerous. When melanoma occurs in people with giant congenital melanocytic nevus, the survival rate is low.

Other types of tumors can also develop in individuals with giant congenital melanocytic nevus, including soft tissue tumors (sarcomas), fatty tumors (lipomas), and tumors of the nerve cells (schwannomas).
Frequency
Giant congenital melanocytic nevus occurs in approximately 1 in 20,000 newborns worldwide.

Causes
NRAS gene mutations cause most cases of giant congenital melanocytic nevus. Rarely, mutations in the BRAF gene are responsible for this condition.

The proteins produced from these genes are involved in a process known as signal transduction by which signals are relayed from outside the cell to the cell's nucleus. Signals relayed by the N-Ras and BRAF proteins instruct the cell to grow and divide (proliferate) or to mature and take on specialized functions (differentiate). To transmit signals, these proteins must be turned on; when the proteins are turned off, they do not relay signals to the cell's nucleus.

The NRAS or BRAF gene mutations responsible for giant congenital melanocytic nevus are somatic, meaning that they are acquired during a person's lifetime and are present only in certain cells. These mutations occur early in embryonic development during the growth and division (proliferation) of cells that develop into melanocytes. Somatic NRAS or BRAF gene mutations cause the altered protein in affected cells to be constantly turned on (constitutively active) and relaying signals. The overactive protein may contribute to the development of giant congenital melanocytic nevus by allowing cells that develop into melanocytes to grow and divide uncontrollably, starting before birth.

Inheritance Pattern
This condition is generally not inherited but arises from a mutation in the body's cells that occurs after conception. This alteration is called a somatic mutation. A somatic mutation in one copy of the NRAS or BRAF gene is sufficient to cause this disorder.

Other Names for This Condition
- congenital giant pigmented nevus of skin
- congenital melanocytic nevus syndrome
- giant congenital melanocytic nevi
- giant congenital pigmented nevus
- giant pigmented hairy nevus
- GMN
- GPHN
Diagnosis & Management

Genetic Testing Information
• What is genetic testing? /primer/testing/genetictesting
• Genetic Testing Registry: Congenital giant melanocytic nevus

Other Diagnosis and Management Resources
• MedlinePlus Encyclopedia: Giant Congenital Nevus
  https://medlineplus.gov/ency/article/001453.htm
• Nevus Outreach: Treatment Options
  https://www.nevus.org/treatment-options
• Primary Care Dermatology Society
  http://www.pcds.org.uk/clinical-guidance/congenital-melanocytic-naevus

Additional Information & Resources

Health Information from MedlinePlus
• Encyclopedia: Congenital Nevus on the Abdomen (image)
  https://medlineplus.gov/ency/imagepages/2901.htm
• Encyclopedia: Giant Congenital Nevus
  https://medlineplus.gov/ency/article/001453.htm
• Health Topic: Birthmarks
  https://medlineplus.gov/birthmarks.html
• Health Topic: Melanoma
  https://medlineplus.gov/melanoma.html

Genetic and Rare Diseases Information Center
• Giant congenital nevus

Additional NIH Resources
• National Cancer Institute: What is Melanoma
  https://www.cancer.gov/types/skin/moles-fact-sheet#q8

Educational Resources
• Children's Hospital of Philadelphia: Birthmarks
  https://www.chop.edu/conditions-diseases/birthmarks
• KidsHealth from Nemours: Birthmarks
• KidsHealth from Nemours: Melanoma

• MalaCards: giant congenital nevus
https://www.malacards.org/card/giant_congenitalnevus

• Merck Manual Consumer Version: Melanoma
https://www.merckmanuals.com/home/skin-disorders/skin-cancers/melanoma

• Orphanet: Large congenital melanocytic nevus
https://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=626

• Seattle Children's Hospital: Birthmarks
https://www.seattlechildrens.org/conditions/common-childhood-conditions/birthmarks/

• What is a Large/Giant Congenital Melanocytic Nevus?
https://www.nevus.org/what-is-a-large-cmn

Patient Support and Advocacy Resources

• Impact Melanoma
https://impactmelanoma.org/

• National Organization for Rare Disorders (NORD)
https://rarediseases.org/rare-diseases/giant-congenital-melanocytic-nevus/

• Nevus Outreach
https://www.nevus.org/

• Resource List from the University of Kansas Medical Center: Dermatology and Genetics
http://www.kumc.edu/gec/support/derm.html

Scientific Articles on PubMed

• PubMed
https://www.ncbi.nlm.nih.gov/pubmed?term=%28Nevus,+Pigmented%5BMAJR%5D%29+AND+%28giant+congenital+melanocytic+nevus%5BTIAB%5D%29+OR+%28giant+congenital+pigmented+hairy+nevus%5BTIAB%5D%29+OR+%28giant+congenital+pigmented+hairy+nevus%5BTIAB%5D%29+AND+human%5Bm%5D+AND+english%5Bla%5D+AND+2018+days%22%5Bd%5D

Catalog of Genes and Diseases from OMIM

• MELANOCYTIC NEVUS SYNDROME, CONGENITAL
http://omim.org/entry/137550
Sources for This Summary


Reprinted from Genetics Home Reference:

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Lister Hill National Center for Biomedical Communications
U.S. National Library of Medicine
National Institutes of Health
Department of Health & Human Services