Neurofibromatosis

Neurofibromatosis is a relatively common AD hereditary disease (1:2,500–4,000 newborns) based on cells derived from the neural bar. It is manifested by abnormal growth of CNS and PNS support cells (Schwann's bb. etc.) with a pronounced predisposition to the formation of benign and malignant tumors[1].

The disease belongs to hereditary tumor syndromes, it occurs in two forms. Familial forms of these syndromes arise as a result of a congenital mutation of tumor-suppressor genes. A certain percentage of these syndromes arise as a result of new mutations[2]. Molecular-genetic analysis is available for definitive confirmation of this diagnosis.

Forms

There are two basic forms of this disease, which differ both in the cause (mutation of different genes) and in the consequences (different clinical picture).

Neurofibromatosis – Type 1

Neurofibromatosis – type 1 (NF-1, also called *morbus von Recklinghausen* or peripheral type of neurofibromatosis) is conditioned by a mutation of the NF1 gene on chromosome 17 (17q11.2)[3]. It is a tumor-suppressor gene whose product (neurofibromin) is part of the intracellular signaling cascade associated with THE RAS-kinase.

⚠ **It is necessary to distinguish *morbus Recklinghausen*, which is synonymous with primary hyperparathyroidism.**

Clinical manifestations of this form include:

- So-called "***café-au-lait spots***" (spots of the color of "white coffee", in 90% appear up to 5 years of age).[2]
- **Neurofibromas** (multiple tumorous nodules; cutaneous, subcutaneous and plexiform; mainly in the axillae and groin).
- **Lisch nodules** (hamartomy iris).[2][3]
- Increased **risk** of developing various cancers: CNS gliomas (optics gliomas), neurofibrosarcoma, rhabdomyosarcoma, pheochromocytoma, leukemia, etc.[2]
- **Involvement of the musculoskeletal system** (subperiosteal neurofibromas – causing hypertrophy of the bone, its thinning and pathological fractures, scoliosis, congenital dysplasia of the tibia)[1].
- Intellectual impairment, epilepsy or stenosis of the renal artery.[2][3]

Neurofibromatosis – Type 2

Neurofibromatosis – **type 2** (NF-2, also called **MISME syndrome** or **central type neurofibromatosis**) is conditioned by mutation of the NF2 gene on chromosome 22 (22q12.2)[3]. It is also a tumor-suppressor gene whose product (neurofibromin 2, also called merlin or schwannomine) affects intercellular contacts. Central neurofibromatosis is generally rarer than the peripheral type, but overall it is associated with higher morbidity and mortality of affected individuals.[2] About half of NF-2 cases are caused by a new mutation.[3]

Clinical manifestations of this form include:

- CNS tumors: meningeomas, astrocytomas, ependymomas, spinal root schwanoms, retinal hamartoms (MISME syndrome = *Multiple Inherited Schwannomas, Meningiomas, and Ependymomas*).
- Bilateral vestibular schwannoma is particularly typical.
- Also in this form we find "*café-au-lait*" spots, but not Lisch's nodules.[2]

Therapy

- Causal therapy does not exist.
- Dispensary of patients with a proven diagnosis of neurofibromatosis is suitable.
- Surgical interventions indicated in case of nerve oppression / obstruction in the GIT form, possibly from a cosmetic point of view.[1]
- Neurosurgical interventions in CNS involvement; possible use of stereotactic neurosurgery (Leksell's gamma knife).

Links

Related articles

- Hereditary tumor syndromes
- Tumor-suppressor genes
- Congenital multiple exostoses
- Enchondromatosis (Ollier's disease)
- Fibrous bone dysplasia (Jaffé-Lichtenstein disease)
- Osteogenesis imperfecta (osteopsatyrhosis, fragilitas ossium)
- Morbus Albers-Schönberg (marble bone, osteosclerosis, osteopetrosis)
- Osteopoiculosis (osteopoicle)

External links

- Neurofibromatosis – Type 1 (eMedicine) (https://emedicine.medscape.com/article/1177266-overview)
- Neurofibromatosis – Type 2 (eMedicine) (https://emedicine.medscape.com/article/1178283-overview)
- The Children's Tumor Foundation (http://www.ctf.org/)

Reference

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2. KLEIBL, Zdeněk a Jan NOVOTNÝ. *Hereditární nádorové syndromy.* 1. vydání. Praha : Triton, 2003. 31 s. ISBN 80-7254-357-1.
3. FIRTH, Helen V., Jane A. HURST a Judith G. HALL. *Oxford desk reference: clinical genetics.* 1. vydání. Oxford : Oxford University Press, 2005. 708 s. ISBN 9780192628961.