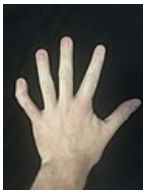
Silver-Russell syndrome

Silver-Russell syndrome (SRS) is a clinical syndrome with a relatively good prognosis, characterized by intrauterine and postnatal growth retardation, feeding difficulties, short stature, body asymmetry, and a typical triangular face with a prominent forehead and other anomalies. It is an epigenetic disease that has a diverse genetic and clinical picture. SRS can be confirmed by molecular genetic testing in some cases, but a negative molecular genetic test does not rule out this diagnosis.

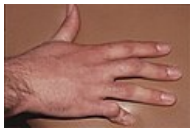
Clinical picture

- **intrauterine growth retardation**
- typical facial dysmorphia: small triangular face, normal head circumference (but due to the small length, the head appears disproportionately large - **relative macrocephaly at birth**) - these features are less noticeable in adulthood than in small children; blue sclerae, **high protruding forehead**, small jaw (micrognathia), corners of mouth turned down;
- **asymmetry of the limbs**, hemihypertrophy, camptodactyly (fixed flexion of the fingers) or clinodactyly of the 5th finger, syndactyly of the 2nd and 3rd toes, late closure of the large fontanel;
- **feeding difficulties**, failure to thrive, **postnatal growth retardation**;
- intestinal motility disorders (gastroesophageal reflux, delayed gastric emptying, constipation);
- fasting hypoglycemia;
- tendency to increased sweating in childhood, especially on the head and upper torso;
- developmental delay;
- difficulty holding the head due to a relatively large head compared to a small body;
- disorder of motor development due to lack of muscle mass and strength;
- normal intelligence or learning disabilities;
- growth hormone (GH) deficiency, abnormalities of spontaneous GH secretion, subnormal response to GH stimulation test;
- short stature in adulthood;
- delayed bone age;
- hypospadias, posterior urethral valve;
- heart defects;
- malignancies (craniopharyngeoma, testicular seminoma, hepatocellular carcinoma, Wilms tumor).

Typická faciální dysmorfie



Klinodaktylie



Kamptodaktylie

Etiology

Příčina onemocnění může být na **chromosomu 7** a to zhruba u 1 z 10 dětí. U většiny se objevuje vada na **11. chromosomu**. Zde dojde k hypometylaci IGF2/H19 lokusu blízko imprinting centra, konkrétně na 11p15. Velmi často jsou postiženy děti rodin, kde se onemocnění dříve neobjevilo. V počtu postižených žen a mužů není rozdíl. Počet lidí s tímto syndromem stále stoupá.[1]

The cause of the disease can be on **chromosome 7**, in roughly 1 in 10 children. Most defects occur on the **11th chromosome.** Here, hypomethylation of the IGF2/H19 locus occurs near the imprinting center, specifically at 11p15. Very often, children from families where the disease has not appeared before are affected. There is no difference in the number of affected women and men. The number of people with this syndrome continues to rise.

Diagnostics

- clinical
- molecular genetic examination (a negative examination does not rule out the diagnosis).

Care/treatment

- optimization of nutrition (in case of excessive intake, the risk of metabolic complications increases; a low volume of muscle mass is typical);
- in case of serious problems with food intake or gastroesophageal reflux - enteral nutrition via gastrostomy

(with or without fundoplication)
- prevention of hypoglycemia (watch for clinical signs of hypoglycemia, measure ketones in the urine, establish a "safe fasting period", administer complex carbohydrates to prevent hypoglycemia)
- physiotherapy
- treatment with recombinant growth hormone (rhGH) to improve growth (daily subcutaneous injection);
- watch for signs of precocious puberty (early onset of adrenarche) and insulin resistance;
- with signs of myoclonic dystonia, verbal or oromotor dyspraxia and/or symptoms of an autism spectrum disorder (usually with maternal uniparental disomy of chromosome 7), follow-up by a pediatric neurologist;
- examination for the presence of scoliosis
- monitoring by a clinical geneticist, gastroenterologist, nutritional therapist, endocrinologist, speech therapist and orthopedist.

Links

Related articles

- Beckwith-Wiedemann syndrome
- Gene imprinting and human pathologies • Gene imprinting
- Epigenetics and human diseases

External links

- Russell-Silver syndrome (Genetics Home Reference) (https://ghr.nlm.nih.gov/condition/russell-silver-syndrome#genes%7C)
- Russell Silver Syndrome (National Organization for Rare Disorders) (https://rarediseases.org/rare-diseases/russell-silver-syndrome/)

Used literature

1. MedlinePlus: *Russell-Silver syndrome*. [Online]. Citováno 15.06.2016. Dostupné na: https://medlineplus.gov/ency/article/001209.htm

Category: Genetics Category: Pediatrics