

SUDDEN INFANT DEATH SYNDROME

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Abstract: The review presents the definition of the concept of sudden (and sudden) death syndrome in children (including infants), its prevalence, probable causes and mechanisms of development, presents diagnostic criteria for some diseases that may not have any symptoms for a long time, but in this case, a sudden fatal outcome is possible, methods for the prevention of SIDS in children (including infants) and optimal emergency care in the case of premorbid SIDS or a life-threatening condition are proposed.

Keywords: Sudden infant death syndrome (SIDS), sudden death, sudden cardiac death (SCD), unexpected death.

INTRODUCTION

The US National Institute of Child Health and Human Development (NICHD) Consensus Panel in 1989 gave the following definition: “SIDS is defined as the sudden death of an infant less than one year of age that remains unexplained after a complete postmortem examination, including autopsy, death scene investigations, and medical records review. Cases not meeting this standard definition, including those in which postmortem examination was not performed, should not be diagnosed as SIDS. Cases that do not meet this definition and that remain unclear after careful post-mortem examination should be classified as uncertain, unexplained, etc.” [1].

MATERIALS AND METHODS

PREVALENCE OF SIDS

This clinical syndrome is common throughout the world. In a number of countries, SIDS occupies a leading position in the structure of child mortality. Sudden death in children (without sudden cardiac death syndrome - SCD) accounts for 5–10% of all child deaths; 1.3–10 per 100,000 population [1]. The incidence of SIDS cases ranges from 0.6 to 7 cases per 1000 children born alive [2]. For example, the mortality rate from SIDS per 1000 births (2018–2022) in Japan averages 0.25; Netherlands – 0.3; Russia – 0.6; Great Britain – 2.3; Germany – 1.6; Austria – 1.0; Italy – 0.5; USA – 2.8.

RESULTS AND DISCUSSION

PREMORBID SIDS

Often, an apparently healthy child falls asleep calmly in his crib, only to be found dead a few hours later. In some cases, the child might even have signs of one or another disease; however, based on the history and assessment of the severity of the condition, it was impossible to imagine that this could lead to death [1]. For example, the following syndromes and symptoms preceding SIDS appear most often [5]: sudden onset of deterioration of the condition; loss of consciousness; convulsive contraction of skeletal muscles of a tonic nature - generalized tonic paroxysm; dilated pupils; absence of pulse in the carotid and brachial arteries; a little later - respiratory failure to complete apnea.

ANTE- AND POST-NATAL FACTORS ASSOCIATED WITH THE ONset of SIDS

The etiology of SIDS (SIDS) remains unclear, but, unlike adults, in children in 80% of cases the cause of sudden cardiac arrest is asystole against the background of increasing hypoxic syndrome [2].

The connection between SIDS and a number of medical, social and congenital factors has been determined, and, above all, those related to the health of the mother and immediate blood relatives [1]. These factors include the unhealthy lifestyle of mothers (smoking, alcohol, drugs, lack of acceptable hygiene, culture and responsibility); frequent pregnancies and a short interval between them; gestosis; illnesses during pregnancy; taking medications, etc.; multiple pregnancy; relatives with a history of sleep apnea, etc.

Serious risk factors include the young age of the mother (15–11 years) and illegitimacy. More often, this syndrome is observed in families with a low educational and material level of parents, if the child lives in unfavorable living conditions [2].

MORPHOLOGICAL FINDINGS IN SIDS

Morphological findings are quite similar and characteristic of “acute death.” At autopsy, sufficient physical development of the child is noted, cyanosis of the lips and nails, bloody fluid in the nasal passages, pulmonary edema, petechial hemorrhages in the thymic capsule, epicardium, under the visceral pleura, large thymus, often occupying the entire anterior mediastinum ; the adrenal glands are reduced in volume or correspond to the norm; edema and swelling of the brain. Some authors point to the normal size of the thymus and lymphoid organs (the latter can be hyperplastic) [2].

THE MAIN SUGGESTED CAUSES OF SIDS CAN BE DIVIDED INTO 2 LARGE GROUPS: ENDOGENOUS AND EXOGENOUS

Endogenous causes of the development of SIDS include: pathology of the central nervous system, primarily the brain stem (ischemia, trauma, abnormalities of serotonergic structures); apnea (central, obstructive, mixed), sleep apnea and abdominal paradox; cardiac mechanisms of SIDS; lymphatism (lymphatic-hypoplastic anomaly of the constitution); metabolic disorders (one of the significant examples is neonatal hypoglycemia); tissue – new hypoxia.

Exogenous causes include: infection; overheating of the newborn; sleeping position of a newborn and young child; the presence of soft toys in the crib; sports factor; electric shock to the heart; rapid intravenous administration of certain medications, for example cardiac glycosides, novocainamide; criminal death.

Acute myocarditis, as a cause of SIDS, is most often associated with infancy. In the vast majority of cases, this process is clinically recognizable, because has a fairly clear clinical picture. This is a cyclical course of the process in the heart, a syndrome of cardiovascular failure and cardiomegaly of varying severity, the appearance in the blood serum of “cardiospecific enzymes” (CPK MB, troponin I, lactate dehyde-hydrogenase 1 and 2 cathodic fractions, etc.), “humoral activity”. The exception is clinical forms, where damage to the conduction system of the heart predominates, manifested by various variants of rhythm disturbances, including fatal ones. However, some “cardiovascular” symptoms are present and death, as a rule, can rarely be unexpected. At older ages and in children of athletes, hypertrophic cardiomyopathy (HCM), incl. caused by heavy physical exertion.

CONCLUSION

SIDS is in most cases observed in children from the sociobiological risk group. The most significant causes and consequences of this risk are: unhealthy lifestyle of mothers (smoking, alcohol, drugs, lack of acceptable hygiene, culture and responsibility); not always high-quality medical examination of a pregnant woman; immaturity and low birth weight of children (IUGR or prematurity); insufficiency of pre- and postnatal medical and preventive care; insufficient awareness of parents about the fatal relevance of this syndrome in society, possible causes, its causes, and practical actions; insufficient organization of full investigative measures (including forensic medical examination) in case of unexpected death of children.

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