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The necessity of supervising the health of children engaged in sports activities – ethical aspects

ABSTRACT:

Children, especially those participating in sports competition, sometimes become objects and/or tools for adults, with excuse that it is necessary for accomplishment of some 'higher' goals (victory, record, acknowledgement, reputation, trophy, medal...). Very often, with this activities, children's health is endangered and/or violated. It happens often when the children are in the period of intensive growth and development, their health is more vulnerable and is a subject to disease, but in sports competitions, insufficient attention is brought to this fact.

Because of that, we recommend medical follow-ups for all children involved in sport (physical and mental development, personal development, their personalities and individual characteristics on the one hand and sport characteristics on the other) as an imperative. Health must be basic, irreplaceable, permanent and unbreakable connection within every athlete, from his/her first sports step to the (possible) Olympic medal.

Key words: bioethics, sport, child, medical follow-up

Children are a special part of the society protected by different legal, societal and social measures. Despite this fact, everyday practice shows that those measure are not sufficient. The most frequent reason are the adults who do not respect basic bioethical settings of protection of a child-person and neglect their (child's!) dignity. Children are frequently, particularly in sports competitions, an object and/or a tool that the adults use in order to achieve "higher" aims (victories, record, acknowledgement, reputation, trophy, medal…).This often damages the health of a child's or-

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ganism which is growing and developing. This is the period in which a child's organism is particularly vulnerable and susceptible to illnesses, physical damages and injuries. This paper has the purpose to give a draft of the need for the systematic supervision of children engaged in sports activities and which are the components of this issue.

First, this paper should answer the question of who is, apart from the sports workers, medically responsible for children, i.e. who 'deals with' children-athletes. Children are usually medically followed by pediatricians, primary care physicians, school medicine physicians, orthopaedists, children surgeons, physiologists, sports medicine physicians (!?), physiotherapists, and periodically other specialists (otolaryngologists, neurosurgeons).[1,2]

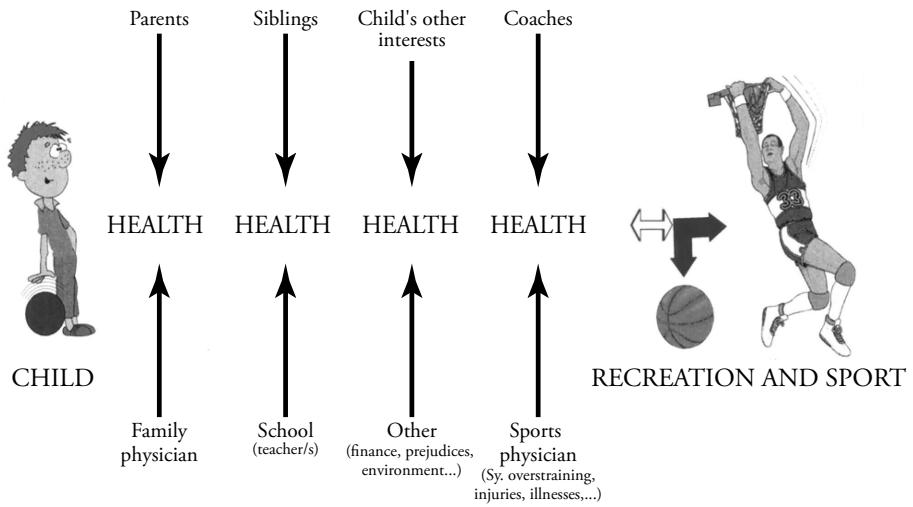
However, the question that remains is who is obligated to promote the sports values and encourage children to engage in sports activities. The possible answer might be: parents, all those who are in any way professionally connected with children and media.

There are numerous beneficial influences of sport on child's growth and development: strengthening of the organism, preserving child's health, richer discovering of the world through the perception system, gaining richer experience about themselves and others, contribution to the development of awareness of one's own body and space/time, development of understanding one's own capacity for movement, feeling of satisfaction and enthusiasm related to their bodies and human movement, contribution to the knowledge and experience of one's physical self, possibility of various social interactions, feeling of success for each child which leads to the feeling of competence and contribution to a positive image of oneself, gaining self-respect, learning to cooperate, developing skills to compete (basis for the adulthood) and learning to follow the rules, awareness and respect of differences, learning of appropriate responses to both victory and defeat, development of skills to deal with conflicts and difficulties, practicing persistence, gaining work habits, contribution to "emotional literacy", development of moral responsibility (fairness towards co-players and opponents), learning to actively participate in one's own success, taking responsibility, investing maximum into "here and now" and be the best possible, development of the ability to consciously regulate one's behavior and many more… It should not be neglected that a child is in sports surroundings usually protected from unwanted influences of the environment, particularly drugs and laziness.

Picture 1 shows the most important influences on children athletes during their development and growing up until they become adult, top athletes. It is obvious that there are many influences which may both positively and negatively shape a child-

athlete, where ethical principles in particular moment of child's sports career can also have a large influence. During his "mature" sports career, an athlete usually "stands against" only a coach and sports physician who, if working in synergy, can be of very positive aid to an athletes in achieving sports results.

Picture 1



Now follows the overview of organ systems of children in the period of growth and development[3], and which is frequently forgotten during the training process and taken into consideration if a child for unknown reasons start achieving poorer sports results.

Changes related to heart: during the growth and development the **frequency of heart** rate varies widely (depending on day/night, season, sex, constitution, emotional states, illnesses, level of shape). **Tachycardia is very frequent** (in cases of high temperature, infections) and **bradycardia is very rare** (but dangerous!).

Is it bioethically and medically justified to remove a child with a benevolent heard condition **instantly** and sometimes permanently remove from sports activities? Who is responsible for such a decision? Such decision should be made by a (sports) physician in cooperation with a pediatric cardiologist, but this is not always the case in practice, i.e. their cooperation is doubtful in such cases.

Heart rhythm changes are also important: newborns often have irregular heart rhythm, which later normalizes. Arrhythmias is present in the early phases of breathing, and in can also be present at vagotonic children passed the age of 6. The changes in heart rhythm depend on mental relaxation, sleep, convalescence, and medica-

tion which effect the vagus nerve tonus. Arrhythmia usually disappears during a deep concentration, mental tension and during work, sport and/or after taking medication which block the activity of the vagus nerve. They are very rare at children with tachycardia. Puberty often brings harmless extrasystolias which differ from the organic (pathological) ones because they disappear during the smallest effort or after a short exercise, and the heart rhythm completely normalizes (⇒ ergometric tests should be used during medical examinations!)

Changes in thorax at child's age: It is soft, gentle, flexible and easily deformed in the age of development. In the process of growing up it becomes firmer so the possibilities of deformities disappears.

The shape of thorax changes, so immediately after birth it is rounded (sagittal AP diameter is 90% of the transversal – LL). Starting from the age of 10 it becomes more oval and more like the thorax of an adult person (sagittal AP diameter is 70% of the transversal – LL)…

Lung changes at child's age: vital capacity of lungs increases over the year, **suddenly around the age of 14** for boys, and apart from the physiological, there are also differences between trained and non-trained children. At birth, respiratory rate at birth is 30-60 breaths per minute. Between the ages of 1 and 2 it is 25-35 breaths per minute, between the ages of 3 and 7 it is 20-30 breaths per minute, between the ages of 8 and 14 it is 18-24 breaths per minute and an average rate in adults is approximately 15 breaths per minute.

Ratio: **Pulse frequency : respiratory frequency = 4:1** (this ratio is smaller in cases of pulmonary diseases, and bigger in cases of heart diseases).

Vegetative system in children: it is functionally immature, unstable, less adaptable to stress and possible diseases result in more difficult (more dramatic) clinical picture.

Mental development of children: from birth until adulthood a child develops from a reflex, inactive being into a perfect organism with all its physical and mental qualities. Social skills, speech, intelligence, behavior, etc. develop. Children are easily susceptible to disturbances of the regular flow of development which may result from harmful external influences (bad upbringing, lack of parental care, various psychic traumas etc.). The younger the child, the more difficult and permanent damages resulting from brain injuries or diseases are, compared to adults, because functional differentiation of brain areas is bigger in adults which leads to a decrease of danger.

Is there a bioethical and medical justification and responsibility for excluding the so called less stable children from sports activities?! Naturally, there is not, but sports

education of such children should be the responsibility of the entire sports staff, parents and they should have appropriate knowledge, skills, as well as enough understanding and patience.

Growth and development of locomotor system usually follows these three rules:

1. unequal intensity of growth of individual organs,
2. nonlinear growth (there are faster and slower periods) and
3. with growth mass increases and the structure of organs changes as well.

Growth is usually most intense in the first year and then at the age of 12 in girls, and the age of 13 in boys (7-8cm annually, but not more than 10!). Weight increase happens at the approximately same time, but it is the biggest towards the end of the completion of growth (!). There are also qualitative changes in the structure of the tissues and the organs which leads to changes in their function (more precisely, it is necessary to 'shape' it with time, adapt to a new shape of the effector (individual organ).

Frequently children with insufficiently shaped and balanced neuro-skeletal-muscular-ligament systems are because of the (legitimately) poorer results removed from sport.

In a few words, the main indicators of growth and development from birth to adulthood can be summarized as follows: respiratory volume increases tenfold, weight increases twenty times, height increases 3.5-4 times, and basal metabolism is reduced by half (calculated per kg/body weight)

This (concise) overview clearly shows the amount and significance of changes of basic organ systems during the growth and development of children, which can change child's abilities in sport so all those who work with children athletes should have them in mind, and particularly coaches and physicians.

Instead of the conclusion: there are many changes occurring during the growth and development of children, which can change the sports success of each individual child.

This is why it is important to medically follow anatomic, morphological, physiological, mental and social changes in children during their growth and development. Also, together with the team of experts, each child athlete's behavior should be examined individually and thus help him or her to achieve given and expected results.

It is unjustified to neglect a child or remove him or her from sport with the excuse that he or she lack talent without prior taking into consideration all previously stated reasons for his or her current lack of success. There are times when in such a pe-

riod the role of a sports doctor or a physiotherapist is of utmost value (if a club has them and asks for consultation!).

The need for medical supervision of children involved in sports activities is an imperative in every, including the smallest, sports staff.

Development of the body and spirit of a person, his or her personality and individuality should be supervised, as well as his or her sports characteristics. That is the only way for the judgment of their abilities needed for sports competitions to be useful in recognizing the influences on their current sports result. In any type of (bio)ethical dilemma, the health must be the core, irreplaceable, permanent and unbreakable link and constant for every athlete from his first sports step to his possible Olympic medal.

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