

Physical exercise during puberty

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Proper understanding of age and sex particularities in the growing generation is of the greatest importance for a correct physical education curriculum, both as regards training and scientific approach.

In our days, no pedagogue or scientist questions the value of physical education in the upbringing of our youth. Only a few people here and there talk of 'sparing the children, particularly at puberty. Their argument is a disproportion in the growth and development of certain internal organs, and above all the cardiovascular system. Many incorrectly compare adolescents with grown ups and come to the conclusion that the young function more uneconomically and that their organism is not yet adapted to stand greater physical load. But such differences exist even in grown up trained sportsmen depending on the functional condition of their organism (form at the time when the check is made, their particular sport or event, etc.), not to speak of the wide gap dividing trained and untrained people.

The development and perfection of habits in the motor system and improvement of the functional capacities of the organism should start at an early age and should continue through life. Unfortunately, this process is sharply interrupted when girls reach puberty.

Often because parents look upon physical exercise and sport as 'unbecoming', girls give up their games just when their influence can be most beneficial to their general development, and take up some other 'more serious' hobby or occupation.

The surveys by Mangurov and Shterev of the Higher Institute of Physical Education in Sofia have amply illustrated how much women lag in physical capacities (speed, strength and stamina) compared with men. This is particularly so during and after puberty. Our own research in this field (Hanne and Iliev) has shown that this inefficiency is not simply related to physical development, but that it is also functional. After the age of 12 or 13, girls absorb less and expend more oxygen during comparatively light physical load, than smaller girls.

Recently our survey covered several groups of girls and boys of different age and in a different stage of puberty. We found negative influence in the functional condition of the boys' organism. With the girls, however,

there was a marked deterioration in the functional condition after the appearance of the menses. Observations showed lower oxygen absorption, poorer running in and recuperation after physical exercises, fall of the oxygen rate, etc. This was generally indicative for a deterioration in the oxidizing-recuperative processes of their organism. It was interesting to note that in girls only 3-4 months younger (no menses but development of secondary sex characteristics showing evidence of hormonal transformation), similar phenomena were not apparent. The data showed very good and even excellent adaptation of the organism to physical strain, as observed in younger girls of 9 to 10 without the characteristic traits of puberty. The survey showed that menstruation caused a sharp interruption of play and games in the open air. While of the 12-13 old girls without menses only 7% did not play outside every day, after the appearance of the monthlies the percentage marked a sharp rise — reaching 73%. Even unorganized games in the backyards or in the streets have a favourable influence on the functional condition of the organism.

We should point out the favourable influence of systematic physical exercise on girls during puberty. Also, negative indicators relating to the functional condition of boys aged 10-11 (without the characteristics of puberty), indulging in excessive intellectual work and playing little in the open.

The development of puberty in the girls differs from that of the boys by the sharp and cyclic manifestation of certain phenomena. We do not deny certain differentiation in hormonal effect, which are probably the cause of the more striking morphological and functional deviations in the female organism. Our research has, however, led us to assume that the morphological, structural, functional and hormonal change taking place when girls reach puberty not the most important factor determining the functional condition of the organism as regards physical capacities.

Comparing the data for the boys and girls and their motor activities in everyday life, one comes to the conclusion that the hormonal transformation of the organism during puberty does not in itself have an unfavourable influence on the functional condition of the organism.

Nevertheless, many authors while accepting the necessity of light physical exercise, declare themselves against competitive sporting activities, pointing out that, at this-time of life, the cardio-vascular system is not yet fully developed and a tendency towards adaptational disturbances. In recent years devitiation from normal development and adaptational disturbances are not only witnessed during puberty, but also in result to the 'overcivilized' way of life. There is a growing opinion that sports are the best antidote for the prophylaxis and treatment of 'diseases of civilization'. Our data and that

of other authors show that growing youngsters have considerable functional potentialities as regards the running-in and recuperative processes of their organisms. Sports are best able to stimulate the development of the cardio-vascular and respiratory systems and to set right disturbances of the libalie at puberty nervous system.

But it should never be forgotten that sport can exercise a positive influence as a regulator and stimulator helping the harmonious physical development only following proper and versatile schedules.

Versatility of physical exercise forms many provisional links in the motory analyser and creates what we call motory culture. Early specialization should not pursue quick successes in a given sport or event, but should

be a process of detailed study and analysis of technique accompanied by all-round physical development. The organism will thus grow into a harmonious whole, with a well developed musculature and fully developed internal organs.

As regards load and strain here again, as with elder sportsmen, they are determined by the degree of training, fitness and functional condition of the organism. During puberty, and young people in general should carry out their training programmes under medical control. Observations on the functional condition of the organism and correct direction of the recuperative processes form the basis on which training can be counted upon to be at the required scientific level.