VALUES OF MAIN SKIN FLAPS IN PRESCHOOL CHILDREN IN THE DISTRICT OF VARNA

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Key-words: skin flap — children — physical development — Varna district

Recently, the interest in overweight and particularly in obesity in childhood increases considerably. On the one hand, it is caused by the constant tendency to rising incidence rate of obesity in most developed countries, and on the other hand, it is stimulated by the lower mean life duration and the higher morbidity rate among obese people. It is of enormous importance predominantly as a prophylatic problem when children are concerned. According to literature data available, obesity in adulthood has begun in childhood in 30 per cent of the cases, and approximately 80 per cent of the adolescents with overweight remain in this state throughout their life (6, 10, 11, 16, 17). Obesity which begins in early childhood and at preschool age is particularly unfavorable. During this period of life it realizes not only on the account of adipocyte enlargement but also on their increasing number, i. e. a hyperplastic obesity type is formed.

Practically, the comparison of body mass with sex, age, and height of the child presents the most commonly used criterion for overweight and obesity evaluation. However, overweight is not always a reliable criterion for obesity. Determination of «passive» tissue and, especially, of thickness of skin flap measured by caliper is of essential importance in this respect (8, 13, 14). That is why practical public health requires caliperometry introduction and elaboration of standard rates for skin flap thickness particularized for any age-sex group.

In view of the fact that such standard rates in Bulgaria have been elaborated predominantly for Sofia children (1, 2, 7, 9) we decided to study the manifestation and distribution of subcutaneous adipose tissue and to elaborate standard rates for skin flap thickness of preschool children in the district of Varna.

Material and methods

We measured height and body weight by means of medical scale with accuracy degree of at least 0.5 cm and 100 g, respectively, of a total of 2317 preschool children reared in all day kindergartens in various towns and villages of the district of Varna. Children's physical development was estimated according to the body weight related to height and sex. We compared our measurements with a table published in Bulgaria (3). We performed caliperometry by means of caliper, type «Lange» exerting a pressure of 10 g/mm² with degree of accuracy up to 0.1 mm of all the children with body weight within ± 2 standard deviations.

We determined the thickness of four main skin flaps: suprailiac, subma
millar, triceps, and subscapular. Suprailiac flap was measured about 2 cm to
the left of the umbilicus at the umbilical horizontal line. Submamillar flap
was measured about 2 cm under the left mamilla, triceps one — on the middle
between acromion and right ulnar process, and subscapular one — immediately
below and laterally of the lower angle of right scapula.

Children were divided into 3 age-sex groups. Data were statistically proce­
sessed by using of variation analysis considering significant any difference at
p < 0.05.

Results and discussion

We established that only 30 children (1.29 per cent) of the whole number
of 2317 children studied had a body weight over 2 standard deviations, i. e.
demonstrated signs of obesity. They were excluded from the group of examina­
tions. We did not find children with body weight below 2 standard deviations,
i. e. with physical retardation. Therefore, a total of 2287 children (of the n., 1100
girls and 1187 boys) were profoundly examined. Their body mass was within
−2 standard deviations. On table 1 and table 2 the average values and the
standard deviations of main and summary skin flaps of these children are pre­
sentated. Caliperometric data show that in all children of the 3 age-sex groups
the abdominal skin flap is the greatest one followed by that on the back, chest,
and arm as distinguished from other authors’ results indicating that the flap
on the arm has been the greatest one (4,9).

The sum of single skin flap thickness (summary flap) characterizes most
completely the degree of deviation of the subcutaneous adipose tissue (5). The
quantity of single skin flap and of summary flap is higher in girls than that
in boys in all age-sex groups studied. Differences become more significant with
age reported by other Bulgarian authors (1, 2, 7, 9).

The differences between our data and those from other countries (12, 15, 16)
are not significant, too, and as far as they exist the probably result from dif­
fences concerning nutritional habits, lifestyles, living standards, climatic
conditions, etc. Just because of that, although usage of foreign standards is
permissible the elaboration of local ones is advisable. The great number of chil­
dren studied by us allowed us to recommend the values of the single skin flaps
established in the present investigation to be considered standard rates for the
corresponding age groups.

We can draw the following conclusions:

1. The values of the main skin flaps of children from all day \textsuperscript{a}kindergartens
in the district of Varna should be considered standard rates for the preschool
age.

2. The manifestation of subcutaneous adipose tissue at preschool age is
more outlined in girls.

3. The abdominal skin flap is the greatest one in all the preschool children.

4. The distribution of the subcutaneous adipose tissue does not demonstrate
any sexual dimorphism in preschool children.

5. The standard values of the thickness of main skin flaps established in
our study can be used in a more inclusive investigation of the obesity and sub­
cutaneous adipose tissue distribution in order to determine standard values
for skin flaps of Bulgarian children.
Table 1
Mean values of main and summary skin flaps in preschool girls in the Varna district

<table>
<thead>
<tr>
<th>Age in years</th>
<th>Children n</th>
<th>Suprailliac</th>
<th>Submamillar</th>
<th>Triceps</th>
<th>Subscapular</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>x</td>
<td>σ</td>
<td>x</td>
<td>σ</td>
<td>x</td>
</tr>
<tr>
<td>3 - 4</td>
<td>398</td>
<td>8.9</td>
<td>3.7</td>
<td>5.3</td>
<td>1.8</td>
<td>4.5</td>
</tr>
<tr>
<td>4 - 5</td>
<td>374</td>
<td>9.8</td>
<td>4.7</td>
<td>5.4</td>
<td>2.2</td>
<td>4.6</td>
</tr>
<tr>
<td>5 - 6</td>
<td>328</td>
<td>9.7</td>
<td>5.3</td>
<td>5.4</td>
<td>2.5</td>
<td>4.8</td>
</tr>
</tbody>
</table>

Table 2
Mean values of main and summary skin flaps in preschool boys in the Varna district

<table>
<thead>
<tr>
<th>Age in years</th>
<th>Children n</th>
<th>Suprailliac</th>
<th>Submamillar</th>
<th>Triceps</th>
<th>Subscapular</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>x</td>
<td>σ</td>
<td>x</td>
<td>σ</td>
<td>x</td>
</tr>
<tr>
<td>3 - 4</td>
<td>432</td>
<td>7.8</td>
<td>3.2</td>
<td>5.1</td>
<td>1.6</td>
<td>4.5</td>
</tr>
<tr>
<td>4 - 5</td>
<td>387</td>
<td>7.4</td>
<td>3.2</td>
<td>4.8</td>
<td>1.5</td>
<td>4.3</td>
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<tr>
<td>5 - 6</td>
<td>368</td>
<td>7.0</td>
<td>3.6</td>
<td>4.7</td>
<td>1.9</td>
<td>4.3</td>
</tr>
</tbody>
</table>
РАЗМЕРЫ ОСНОВНЫХ КОЖНЫХ СКЛАДОК У ДЕТЕЙ ДОШКОЛЬНОГО ВОЗРАСТА В ВАРНЕНСКОМ ОКРУГЕ

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РЕЗЮМЕ

Измерялась толщина кожной складки в области живота, груди, плеча и спины у 2287 детей школьного возраста. Дети были из детских садиков различных городов и сел Варненского округа с весом тела — отнесенным к росту — в рамках ± 2 стандартных отклонений. Дети были распределены в три группы в зависимости от возраста и пола. Полученные данные были обработаны статистически.

У всех детей наиболее крупная кожная складка установлена на животе. Она варьировала в отдельных группах от 7,0 ± 3,6 мм до 9,8 ± 4,7 мм. Вторая по величине была кожная складка на спине — от 5,6 ± 1,7 до 6,5 ± 2,7 мм. Третья по величине складка — на груди — от 4,7 ± 1,9 до 5,4 ± 2,5 мм, а четвертая — плечевая — от 4,3 ± 1,5 до 4,8 ± 2,0 мм.

Подкожная жировая ткань более выражена у девочек как половой дисморфизм в распределении.

На основании полученных результатов авторами предлагаются нормативы относительно толщины основных кожных складок у детей дошкольного возраста в Варненском округе.