Studies on fatty liver, blood glucose and related factors in simple obese children  

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Objective To study the prevalence of fatty liver, blood glucose and related factors in simple obese children. Methods Their liver was scanned with B-type ultrasound and fasting blood glucose with a microassay glucometer as well as other related morphological and functional indices were measured in 62 children aged 8 to 11 years, including 32 obese ones and 30 control ones. Results Prevalence of fatty liver in obese and control groups was 93.8% and 10% respectively with very statistically significant difference (P < 0.01). Blood glucose level in obese and control groups was 5.42 mmol/L and 4.54 mmol/L respectively with statistically significant difference (P < 0.05). Proportion of children with normal cardiac function was 62.5% and 93.3% respectively in obese and control groups with significant difference (P < 0.05). The prevalence of fatty liver correlated positively with skin-fold thickness, waist to hip ratio, WHR and body mass index, BMI with coefficients of correlation of 0.878 6, 0.625 6, 0.845 4 respectively (P < 0.01). Blood glucose correlated with skin-fold thickness and BMI positively with coefficients of correlation of 0.340 3 and 0.315 5 respectively (P < 0.05). Regression analysis showed that skin-fold thickness and WHR were major risk factor for fatty liver and skin-fold thickness was major risk factor for high blood glucose. Conclusions Simple obesity could cause damage to the liver, glucose metabolism and cardiac function in children forming the potential risk factors for cardiovascular diseases, diabetes and disturbance of lipid metabolism in adults.

Key words Obesity, Fatty liver, Blood glucose, Child
身体测量:采用统一标准仪器按常规正确测量受检儿童的身高、体重、腰围、臀围、皮褶厚度、血压和脉搏等。

肝脏超声检查:采用日本阿洛卡株式会社研制的阿洛卡超声诊断仪,由济南市中心医院超室协助检查。

血糖测定:采用美国研制的快速微量血糖仪和型血糖试纸。酒精消毒无名指,取末梢血滴,用快速微量血糖仪检测血糖浓度。空腹血糖正常值为4.4~6.7 mmol/L。

心功能良好率:将一次心功能试验结果按心功能状况判断标准计算,即负荷后收缩压在第278上升值小于22,舒张压在第278下降值小于22,心率在第278上升值小于安静时的-),且在后血压、脉搏基本恢复至安静时者为良好。

统计方法:采用检验、四格表确切概率法、相关与回归分析等。

结果:两组儿童脂肪肝患病率、血糖和心功能良好率的比较(表1):肥胖组脂肪肝患病率明显高于对照组,肥胖组血糖明显高于对照组,肥胖组心功能良好率明显低于对照组。

<table>
<thead>
<tr>
<th>组别</th>
<th>例数</th>
<th>脂肪肝患病率(%)</th>
<th>血糖(2234 5 6)</th>
<th>心功能良好率(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>对照组</td>
<td>30</td>
<td>3 10.0</td>
<td>4.54 ± 1.16</td>
<td>28 93.3</td>
</tr>
<tr>
<td>肥胖组</td>
<td>32</td>
<td>30 93.8**</td>
<td>5.42 ± 1.20</td>
<td>20 62.5**</td>
</tr>
</tbody>
</table>

**P < 0.05**  **P < 0.01**

讨论:单纯性肥胖对儿童肝脏的影响:脂肪肝在儿童期即可出现,儿童肥胖程度与脂肪肝患病率之间有直线关系,本研究结果与此结果一致,并得出皮褶厚度和WHR是脂肪肝的主要危险因素,即脂肪肝的患病率随着皮褶厚度增加而增加,随着WHR值的增高而增加,说明肥胖(尤其是向心性肥胖)更易发生脂肪肝。脂肪肝的形成是脂代谢紊乱的一种表现形式,是由于进入肝脏脂肪量超过了肝脏脂代谢能力,使脂肪颗粒在肝细胞内堆积而形成脂肪肝。如果肝内脂质长期堆积,并且脂质量逐渐增加,引起肝细胞变性,可能导致肝功能异常。

单纯性肥胖对儿童血糖浓度的影响:本研究表明,皮褶厚度是高血糖的主要危险因素,即随着皮褶厚度的增加,血糖浓度上升。肥胖者有糖代谢障碍,并且有胰岛素抵抗,而出现了高胰岛素血症,最终将导致胰岛细胞的衰竭,而发生糖尿病。

单纯性肥胖对儿童心功能的影响:本结果显示,肥胖组心功能良好率显著低于对照组。肥胖儿童血脂高,血浆黏度大,血流缓慢,血管弹性差,从而使心功能减低,并且肥胖儿童体脂增多后,相对内脏组织缺氧,神经功能传导障碍,窦房节功能不稳定,心脏收缩力和顺应性下降。这不仅影响了儿童期心脏功能,而且由于这种顺应性的降低,很难随体重的下降而恢复,而为成年后心脏疾患埋下了隐患。