EFFECT OF DIET AND SALT INTAKE ON DEVELOPMENT OF HYPERTENSION IN CHILDREN AND ADOLESCENTS

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CAUSES OF H IN CHILDREN

0 -1y
- Tromboembolic
- Kidney cong. ab.
- Aortic coarct.
- BPD
- Renovascular (parenchimal) d.
- Iatrogenic

1-10y
- Renal vascular d.
- Renal parenchimal d.
- Aortic coarct.
- Tumors
- Endocrine d.
- Iatrogenic
- Essential
CAUSES OF H IN ADOLESCENTS

Essential
Iatrogenic
Renal
Endocrine disease
PREVALENCE OF H IN CHILDREN AND ADOLESCENTS

ADULTS: 25(40)%
Croatia 37,5%

CHILDREN: 0,8 – 2(7-22)%
(Subhi MD.Saudi Med J.2006;27, Ramos E. Rev Port Card.2005;24)
TRACKING BP FROM CHILDHOOD TO ADULTHOOD

Circulation.2008;117:3171-80
TRAGET ORGAN INJURY

- HART
- POSTERIOR REVERSIBLE LEUCOENCEPHALOPATHY SYNDROMA
- RETINAL CHANGES
- KRI
THE RELATIONSHIP PH AND OW/OB

- Bogalusa Study: H: 2.4-4.5 x in obese chld
  *Freedman DS et al. Pediatrics 1999;103:1175-82*

- Rosner et al: 90c BMI-H

- Sorof et al: 3x više H in obese adolescents
  *Sorof JM. J Pediatr 2002;140:660-6*
<table>
<thead>
<tr>
<th>SEX</th>
<th>SAMPLE SIZE</th>
<th>% OVERWEIGHT) (BMI &gt;25 kg/ m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>2878</td>
<td>68.3</td>
</tr>
<tr>
<td>F</td>
<td>6162</td>
<td>58.2</td>
</tr>
<tr>
<td>TOTAL</td>
<td>9040</td>
<td>61.40</td>
</tr>
</tbody>
</table>
OW/OB IN CHILDREN

- USA: 21% ow/ob (2003y)
- EUROPE:
  - N. COUNTRIES: 10-20%
  - MEDITERIAN C: 20-40%
  - CROATIA: 16%
### Age and Gender in 113 Children with PH

<table>
<thead>
<tr>
<th>AGE (YEARS)</th>
<th>10-12,5</th>
<th>13-15,5</th>
<th>16-17,5</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>17</td>
<td>35</td>
<td>13</td>
</tr>
<tr>
<td>F</td>
<td>15</td>
<td>27</td>
<td>6</td>
</tr>
<tr>
<td>ALL</td>
<td>32 (28%)</td>
<td>62 (55%)</td>
<td>19 (17%)</td>
</tr>
<tr>
<td>GENDER</td>
<td>5-85c</td>
<td>&gt;85</td>
<td>All</td>
</tr>
<tr>
<td>--------</td>
<td>-------</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>M</td>
<td>25</td>
<td>40  (62%*)</td>
<td>65  (58%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( p = 0.06 )</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>27</td>
<td>21  (44%)</td>
<td>48  (42%)</td>
</tr>
<tr>
<td>ALL</td>
<td>52</td>
<td>61  (54%)</td>
<td>113 (100%)</td>
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</tbody>
</table>
## Grade of H in Overweight/Obesa Children

<table>
<thead>
<tr>
<th>Grade of H</th>
<th>BMI &gt;85c</th>
<th>BMI &lt;85c</th>
<th>ALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre H</td>
<td>0 (0 %)</td>
<td>10 (19%)</td>
<td>10</td>
</tr>
<tr>
<td>I grade</td>
<td>10 (15%)</td>
<td>20 (38%)</td>
<td>30</td>
</tr>
<tr>
<td>II grade</td>
<td>51 (85%)</td>
<td>22 (43%)</td>
<td>73</td>
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</tbody>
</table>

**p=0.000**
- 5% added while cooking
- 6% added while eating
- 12% from natural sources
- 77% from processed and prepared foods
THE RELATIONSHIP PH AND SALT INGESTION IN CHILDREN

Ingestion of 1g more salt (children 4-18 years): elevation of systolic BP 0.4 mmHg and pulse pressure 0.6 mmHg

He FJ, Marrero NM, MacGregor GA. J Hum Hypertens 2008;22(1):4-11
# Recommendations on Salt Intake in Children

<table>
<thead>
<tr>
<th>Age</th>
<th>&lt; 1g</th>
<th>1 g</th>
<th>2 g</th>
<th>3 g</th>
<th>5 g</th>
<th>6 g</th>
</tr>
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<tbody>
<tr>
<td>&lt; 6 mo</td>
<td></td>
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<tr>
<td>6-12 mo</td>
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<tr>
<td>1–3 y</td>
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<td>4-6 y</td>
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<td>7-10 y</td>
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<tr>
<td>11-14 y</td>
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</table>
HOW TO REDUCE SALT IN DIET

- FRESH FOOD; FRESH FROZEN FOOD
- CANNED FOOD without ADDED SALTS
- Avoid CHIPS and PRETZELS, canned SOUPS etc.
- REED FOOD LABELS
- SPICES AND HERBS instead of SALT
WHERE IS CROATIA TODAY?

- PROMOTION OF BREAST FEEDING
- NEW DIETARY APPROACH IN KINDERGARTEN
- “LESS SALT-MORE HEALTH”
TASKS FOR PEDIATRICIANS AND GP

- Prevention/treatment ow/ob
- Less salt ingestion
- Early diagnosis/therapy of PH
  (performing blood pressure measurements 1 x year in chldr. age ≥ 3)
TASKS FOR PEDIATRICIANS AND GP

- Support breastfeeding
- Do not overfeed infants and young children
- Introduce healthy foods with less salt
- Physical activity