Potentially detrimental lifestyle behaviours in adolescents with congenital heart disease in the transition to adulthood


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My declaration of interest:

I have nothing to declare
Introduction

Adolescence:

• developmental stage characterized by growing independence and experimenting behaviours
  smoking tobacco, use of drugs, drinking alcohol

• expectation to increasingly take responsibility over own health and health care

• crucial stage in life for teens to develop healthy lifestyle choices
Introduction (2)

Adolescents with congenital heart disease (CHD):
- have a chronic condition
- are susceptible for developing complications (e.g. arrhythmias, ventricular dysfunction, endocarditis)
- prevention of those complication: regular specialized follow-up and health-promoting lifestyle
  - moderate use of alcohol
  - avoidance of smoking cigarettes
  - no use of illicit drugs
  - excellent oral hygiene
  - adequate engagement in physical activities
  - good dietary habits
What is already known?

- **Substance use:**
  - rates of substance use (tobacco, illicit drugs or alcohol) in adolescents with CHD were lower than controls
  - 28% of adolescents and 54% of young adults performed significant substance use during last month

  (Uzark et al., 1989; Reid et al., 2008; Chen et al., 2007)

- **Dental care:**
  - only small proportion (15%) of patients with CHD have excellent oral hygiene

  (Reid et al., 2008; Chen et al., 2007)
Aim of the study

1. to investigate the **prevalence of health-compromising behaviours** in adolescents and young adults with CHD aged 14-19 years

2. to **compare** the prevalence of these behaviours with **matched controls** (1:1 matching)

3. to explore the **natural history** of lifestyle over a 9-month period
Methods

• Part of 4-wave longitudinal i-DETACH study
• Sample:
  – 429 adolescents and young adults aged 14-19y
  – 401 controls from general population matched (1:1) on age and gender
• Data on lifestyle collected using self-report Health Behaviour Scale-CHD:
  • consumption of alcohol (frequency, amount, frequency of binge drinking)
  • use of tobacco (frequency, number of cigarettes,…)
  • dental care last dental visit, frequency of brushing and flossing teeth
  • physical activities including school sports (levels of physical activity, time engaged in activity)
Calculation of composite scores:

1. **Substance use risk score**
   - binge drinking at least monthly (≥6 consumptions of alcohol at one occasion) + smoking cigarettes + illicit drug use once a month or less
   - score range: 0-3

2. **Dental hygiene risk score**
   - no annual dental visit + not brushing teeth daily + not flossing teeth
   - score range: 0-3

3. **Overall health risk score**
   - substance use risk score + dental hygiene risk score + absence of participation in physical activities
   - score range: 0-7

→ 3 risk scores transformed to scale 0-100
→ **higher** risk scores indicate **worse** health behaviour
Validity of HBS-CHD

Moderated posters area

Analysis of the validity of the Health Behaviour Scale -CHD in adolescents and young adults with congenital heart disease based on test content

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Background
- Adolescents are often amenable to experiment with (abuse of) alcohol, illicit drugs and cigarettes.
- These behaviours are potentially harmful for adolescents with congenital heart disease (CHD) and should be discouraged to optimize long-term health.
- Studies investigating health risk behaviour in adolescents and young adults with CHD are sparse.
- To date, no standardized comprehensive instrument exists to collect data on health behaviours in adolescents and young adults with CHD.
- Based on 4 existing questionnaires, we developed a Health Behaviour Scale -CHD to assess health-compromising behaviours such as smoking, consumption of alcohol, use of illicit drugs and non-participation in physical activities.

Methods
- Ten experts (7 cardiologists, 3 nurses) evaluated the relevance of all scale items using a 4-point rating scale (1=not relevant; 4=highly relevant).
- Calculation of item (IC-V) and averaged scale (SV-CV) level content validity indices was performed.
- The existence of the content validity was assessed using generally accepted cut-off values (0.50 IC-V; 0.50 SV-CV).
- To adjust for agreement by chance, the modified multi-rater Kappa ($\kappa^*$) was calculated.

Results
- What is validity based on test content?
  - "Validity" is the extent to which a test measures what it is claimed to measure. Important validity evidence can be obtained from an analysis of the relationship between test content and the construct (e.g., health behaviors) it is intended to measure.
  - "Test content" refers to the themes, wording and format of the scale items or questions on an instrument, as well as the guidelines for scoring the items.

Assessment of the reference of all scale items
- 14 out of 22 (63.6%) Health Behaviour Scale-CHD items were rated with excellent content validity.
- Two items (item 11 and 35) obtained an IC-V of 0.00 and a $\kappa^*$ of 0.50, representing a fair content validity.
- One item (item 11) was evaluated as having a poor content validity (IC-V=0.00, $\kappa^*$=0.34).

Assessment of the overall instrument:
- The S-CV was 0.81 and the overall instrument’s Kappa was 0.78, reflecting an adequate content validity.
- If the three items with poor or fair content validity (items 74, 11 and 35) were removed, the overall instrument’s S-CV increased to 0.85.

Conclusions
- The Health Behaviour Scale-CHD was developed as a brief and comprehensive questionnaire to evaluate the health risk behaviors of adolescents, young adults and adults with CHD.
- This study offered evidence that the Health Behaviour Scale-CHD is content valid for its use in research and clinical practice.
- Further assessment of the criterion properties such as the stability of the instrument is needed.
Results

Prevalence of health-compromising behaviours

- 56% uses alcohol on regular basis
- 11% performed binge drinking (≥6 consumptions of alcohol during one occasion)
- 7% smoked cigarettes regularly
- 3% used illicit drugs occasionally (XTC, speed, marijuana)
- 11% had no dental visit during past year
- 65% never flossed their teeth
- 8% brushes their teeth only occasionally
- 22% did not perform any kind of physical activities
Comparison health behaviours with matched controls (n=401)

- Substance use risk score and overall health risk score were **lower** in patients than controls (p<.001)
- Dental hygiene risk score was significantly **higher** in patients (p=0.04)

<table>
<thead>
<tr>
<th>Health behaviours</th>
<th>Pts with CHD</th>
<th>Matched controls</th>
<th>Test statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visit to dentist past year</td>
<td>359/401</td>
<td>337/397</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>(89.5%)</td>
<td>(84.9%)</td>
<td></td>
</tr>
<tr>
<td>Daily brushing of teeth</td>
<td>372/401</td>
<td>383/401</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>(92.8%)</td>
<td>(95.5%)</td>
<td></td>
</tr>
<tr>
<td>Flossing of teeth</td>
<td>147/401</td>
<td>214/401</td>
<td>p&lt;.001</td>
</tr>
<tr>
<td></td>
<td>(36.7%)</td>
<td>(53.4%)</td>
<td></td>
</tr>
</tbody>
</table>
## Results (3)

### Risk scores according to age group:

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Substance Use Score (mean ± SD)</th>
<th>Dental Hygiene Score (mean ± SD)</th>
<th>Overall Health Score (mean ± SD)</th>
<th>Test Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>14-14.9y</td>
<td>1 ± 8</td>
<td>26.5 ± 23.1</td>
<td>14.8 ± 12.9</td>
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<tr>
<td>15-15.9y</td>
<td>5.7 ± 18.8</td>
<td>26.5 ± 19.3</td>
<td>16.6 ± 13.4</td>
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<tr>
<td>16-16.9y</td>
<td>8.3 ± 20.3</td>
<td>31.7 ± 25.5</td>
<td>19.9 ± 16</td>
<td><em>Z</em> = -3.71, <em>p</em> &lt; 0.001</td>
</tr>
<tr>
<td>17-18.9y</td>
<td>8.7 ± 19.1</td>
<td>22.7 ± 20.9</td>
<td>17.6 ± 14.2</td>
<td><em>Z</em> = 1.37; NS</td>
</tr>
</tbody>
</table>

**Increasing Risk**
Results (4)

Exploration of natural history of health behaviours over 9 months:

- Substance use score ($Z=-2.83; p=.005$) and overall health risk score ($Z=-3.38; p=.001$) increased significantly over 9-month interval
- Dental hygiene risk scores remained relatively stable
Conclusions

• Prevalence of risky health behaviours increased significantly when patients grow older

• Compared to peers, substance use and overall health risk score were lower in patients

• Dental hygiene risk scores were higher in patients → susceptible for developing endocarditis
Conclusions (2)

• Health risk scores were highest in age cohort of 16-16.9 years
• Age of 16 years is crucial point for adolescents with CHD → transfer of care to ACHD clinic often occurs at age 16-18y
• Special attention and coaching needs to be given to this age group in order to develop a health-promoting lifestyle
• Education and coaching of patients is mandatory and can be part of transition program
For further information:

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