What determines drop out in prospective studies of coronary heart disease risk factors between youth and young adulthood: the Young Hearts Study

F J van Lenthe, C A Boreham, J W R Twisk, M J Savage, L Murray, G Davey Smith

The growing recognition of the importance of early life factors in the development of coronary heart disease (CHD) may increase prospective research in this period of life. From a methodological point of view, drop out of subjects, particularly when this is selective, is a major threat to the validity of the results. Specific information about determinants of drop out in current studies may therefore yield important information for future studies. We have analysed risk of drop out in the Young Hearts Project, a prospective study in Northern Ireland.1

Methods and Results

The Young Hearts Project is a prospective cohort study, which started in two cohorts of 12 year old boys (n=251) and girls (n=258) and 15 year old boys (n=252) and girls (n=254) in Northern Ireland (overall response rate 78%) in 1988. Its aim and design have been described elsewhere in detail.1 In 1992/93 these children were re-examined under identical conditions. In 1997 the third wave of data collection was carried out in participants mean age 21 years (cohort 1) and 24 years (cohort 2).

In cohort 1 and 2 data were obtained from 49.9% (boys: n=135; girls: n=119) and 46.4% (boys: n=116; girls: n=119) respectively of the subjects included at baseline. We created a dichotomous variable thereby distinguishing those at baseline who were still in the study nine years later from those who were in the study initially but who dropped out of the study. Logistic regression analysis was carried out to investigate if less then good perceived general health, sociodemographic (sex and socioeconomic position), biological (birth weight, body height, body weight, sum of four skinfolds, systolic and diastolic blood pressure, total serum cholesterol, high density lipoproteins and cardiorespiratory fitness (measured by the 20 metre shuttle run test) and behavioural (physical inactivity, total energy intake, and intake of fat, cholesterol, fruit and vegetable) risk indicators of coronary heart disease at baseline were associated with risk of drop out. Indicators univariately associated with risk of drop out (p< 0.20) were entered in a multivariate analyses; final models were derived using a backward elimination procedure.

Table 1 presents the univariate and multivariate associations for the final models. Consistent findings in both cohorts are the significantly increased odds ratio for those in the manual compared with the non-manual groups. Odds ratios of drop out increased by increasing sum of skinfolds (in cohort 1) and increasing systolic blood pressure (in cohort 2). In both cohorts risk of drop out was associated with birth weight; however, an increased odds ratio was found in subjects in the lower tertile of birth weight in cohort 1 and the upper tertile of body height in cohort 2.

Table 1 Determinants of drop out in the Young Hearts Project between the first (1988) and third (1997) wave of data collection in boys and girls 12 and 15 years of age at baseline

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cohort 1 (12 years at baseline)</th>
<th>Cohort 2 (15 years at baseline)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Univariate</td>
<td>Multivariate</td>
</tr>
<tr>
<td></td>
<td>Number</td>
<td>Odds ratio (95% CI)</td>
</tr>
<tr>
<td>Socioeconomic position</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Non-manual</td>
<td>280</td>
<td>1.00</td>
</tr>
<tr>
<td>Manual</td>
<td>178</td>
<td>1.97 (1.35, 2.88)</td>
</tr>
<tr>
<td>Missing</td>
<td>51</td>
<td>3.79 (1.96, 7.32)</td>
</tr>
<tr>
<td>Birth weight (100 g)</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Normal</td>
<td>156</td>
<td>1.00</td>
</tr>
<tr>
<td>Low (&lt;3118 g)*</td>
<td>155</td>
<td>1.22 (0.78, 1.90)</td>
</tr>
<tr>
<td>High (&gt;3540 g)</td>
<td>154</td>
<td>0.62 (0.40, 0.98)</td>
</tr>
<tr>
<td>Missing</td>
<td>44</td>
<td>1.51 (0.76, 2.99)</td>
</tr>
<tr>
<td>Sum of skinfolds (cm)</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>Normal</td>
<td>509</td>
<td>1.12 (1.02, 1.23)</td>
</tr>
<tr>
<td>Low (&lt;3180 g)*</td>
<td>155</td>
<td>1.22 (0.78, 1.90)</td>
</tr>
<tr>
<td>High (&gt;3629 g)</td>
<td>154</td>
<td>0.62 (0.40, 0.98)</td>
</tr>
<tr>
<td>Missing</td>
<td>44</td>
<td>1.51 (0.76, 2.99)</td>
</tr>
<tr>
<td>Socioeconomic position</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Non-manual</td>
<td>253</td>
<td>1.00</td>
</tr>
<tr>
<td>Manual</td>
<td>189</td>
<td>1.79 (1.22, 2.62)</td>
</tr>
<tr>
<td>Missing</td>
<td>64</td>
<td>1.45 (0.83, 2.51)</td>
</tr>
<tr>
<td>Birth weight (100 g)</td>
<td>0.06</td>
<td>0.06</td>
</tr>
<tr>
<td>Normal</td>
<td>155</td>
<td>1.00</td>
</tr>
<tr>
<td>Low (&lt;3180 g)*</td>
<td>157</td>
<td>1.33 (0.85, 2.07)</td>
</tr>
<tr>
<td>High (&gt;3629 g)</td>
<td>154</td>
<td>1.80 (1.15, 2.83)</td>
</tr>
<tr>
<td>Missing</td>
<td>40</td>
<td>1.77 (0.88, 3.60)</td>
</tr>
<tr>
<td>Body height (cm)</td>
<td>0.11</td>
<td>0.11</td>
</tr>
<tr>
<td>Normal</td>
<td>506</td>
<td>1.29 (1.11, 1.49)</td>
</tr>
<tr>
<td>Missing</td>
<td>44</td>
<td>1.45 (0.83, 2.51)</td>
</tr>
</tbody>
</table>

*Values based on tertiles, with missing values included as a separate group.

References

in cohort 2. There seemed to be no statistically
significantly associations between behavioural
risk indicators of coronary heart disease and
risk of drop out.

Comments
We described the profile of children at
increased risk of drop out. Clearly, there is no
information as to whether these children still
have the same risk profile in young adulthood.
Tracking studies however predict a relative sta-
bility in risk factors in age and sex specific
populations over time. Hence, there are
reasons to expect that those who dropped out
of the study are likely to show the same risk
profile in young adulthood as they did in child-
hood.

In non-response research refusal, illness and
having moved to another school were given as
main reasons for drop out between the first and
second period of measurement. Unfortunately, no such information is available be-
tween the second and third wave of data
collection.

In our study, socioeconomic position seemed
to be a main determinant of drop out. Interest-
ingly, there is increasing awareness of the need
to study socioeconomic inequalities in coron-
ary heart disease from a life course perspec-
tive. Our findings suggest that socioeconomic
inequalities in coronary heart disease risk indi-
cators in early life may be underestimated as a
consequence of selective drop out by socioeco-
nomic position (and some coronary heart
disease risk indicators). While further investi-
gating the life course perspective, researchers
need to pay particular attention to those in
lower socioeconomic groups with respect to
adherence to the study.

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Ireland Chest, Heart and Stroke Association, the British Heart
Foundation and Wellcome Trust.

Conflicts of interest: none.

1 Boreham C, Savage JM, Primrose D, et al. Coronary risk
2 Twisk JWR, Kemper HCG, Mechelen W van, et al. Tracking
of risk factors for coronary heart disease over a 14-year
period: a comparison between lifestyle and biologic risk
factors with data from the Amsterdam Growth and Health
3 Twisk JWR, Boreham C, Cran G, et al. Clustering of
biological risk factors for cardiovascular disease and the
longitudinal relationship with lifestyle of an adolescent
population: *The Northern Ireland Young Hearts Project.*
socioeconomic position and mortality: prospective obser-
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