LETTERS TO THE EDITOR

Association Between Birth Weight and Adult Disorders in Twins: Validity of Self-reported Birth Weight

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As was pointed out issue 4.5 of Twin Research, a growing number of studies have suggested that small size at birth, is associated with an increased propensity to a number of adverse health outcomes in adult life, including hypertension and cardiovascular disease (the fetal origins hypothesis) (Roseboom & Lambalk, 2001). These associations could, however, also be due to genetic or socioeconomic factors affecting both birth weight and health in later life (e.g., size of blood pressure). These confounders can, despite a number of methodological limitations and potential biases, to some extent be controlled for through studies of twin pairs (Leon, 2001).

One very important source of bias not adequately addressed in a number of twin studies concerning birth weight and later disease is the validity of self-reported birth weight data (Leon, 2001). In line with Leon (2001) we think that a measurement concerning individual birth sequences within all twin pairs when asking each twin separately. The degree of agreement between the two measures of birth weight can be estimated by using a simple plot of the difference between the two methods (self-reported minus measured birth weight) against their mean (self-reported + measured birth weight divided by 2) (Bland & Altman, 1986) (see Figure). From our data, the mean difference in birth weight (self-reported – measured) is 6.2 gram with a standard deviation of 340 gram, giving a 95% confidence interval of –660 to +672 gram. Thus, the self-reported birth weight may be 660 gram below or 672 gram above the measured birth weight, (see Figure).

In a similar way we estimated the validity of the intra-pair birth weight difference (birth weight of the first minus second born) when birth

![Figure 1](https://doi.org/10.1375/twin.5.4.308)

Figure 1

classification of the twins in a pair as the first- or second-born twin was based on information from the participating twins concerning the birth sequence. There was complete agreement concerning individual birth sequences within all twin pairs when asking each twin separately. The degree of agreement between the two measures of birth weight can be estimated by using a simple plot of the difference between the two methods (self-reported minus measured birth weight) against their mean (self-reported + measured birth weight divided by 2) (Bland & Altman, 1986) (see Figure). From our data, the mean difference in birth weight (self-reported – measured) is 6.2 gram with a standard deviation of 340 gram, giving a 95% confidence interval of –660 to +672 gram. Thus, the self-reported birth weight may be 660 gram below or 672 gram above the measured birth weight, (see Figure).

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Figure 1

Average birth weight by SBW and MBW.

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Birthweight in Dizygotic Twins

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Loos et al. (2001) reported that among a large sample (n = 1929) of Dutch dizygotic (DZ) twin pairs, mean length of gestation in MF pairs is similar to that in FF pairs, and significantly longer than in MM pairs. Mean birthweight of girls from MF pairs was similar to that of girls in FF pairs, but boys from MF pairs were significantly heavier than boys from MM pairs. These authors concluded that "these data show that in unlike-sex pairs, it is the girl that prolongs gestation for her brother". I responded (James, 2002) with the suggestion that differences in birthweight are consequent on competition for nutrient, and that males, being programmed to grow faster, are more successful in that competition. I acknowledged that my interpretation "would carry the expectation that females in MF pregnancies should weigh less than females in FF pregnancies" (a feature which was not evident in the data of Loos et al., 2001). Here I draw attention to some prior data which confirm that suggestion.

Orlebeke et al. (1993) reported on a larger sample of Belgian twins (n = 2277 DZ pairs). In this sample, considerable discrepancies between the two measurements of birth weights. We suggest that validated birth characteristics should be used for this type of study.

### Table 1

<table>
<thead>
<tr>
<th>Sex Combination of Pair</th>
<th>MM (n = 651)</th>
<th>MF (n = 542) and FM (n = 490)</th>
<th>FF (n = 594)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>2600</td>
<td>2622</td>
<td>2510</td>
</tr>
<tr>
<td>Female</td>
<td>2494</td>
<td>2510</td>
<td>2484</td>
</tr>
</tbody>
</table>

References


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