The roles of oligomenorrhoea and fetal chromosomal abnormalities in spontaneous abortions

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The pathogenesis of spontaneous abortions, other than fetal chromosomal abnormalities, is not fully understood. We examined the incidence of oligomenorrhoea in relation to fetal chromosomal analyses and ultrasonographic examination in women who aborted spontaneously. The data demonstrated that the incidence of oligomenorrhoea was higher in women with normal fetal karyotyped abortions, especially normal karyotyped anembryonic pregnancies, than in those with abnormal karyotyped abortions (34.0 versus 12.5%, \( P < 0.01 \)). Furthermore, the incidence of oligomenorrhoea was inversely correlated with fetal size exclusively in abortions with normal fetal karyotypes. It is suggested that oligomenorrhoea, i.e. delayed ovulation, itself may be closely associated with sporadic spontaneous abortion.

Key words: chromosome/oligomenorrhoea/spontaneous abortion

Introduction

Spontaneous abortion, with an incidence of up to 10-15% (Holman et al., 1984), is the most common complication of pregnancy. It is generally accepted that more than half of all early (within 11 complete gestational weeks) spontaneous abortions are due to fetal chromosomal abnormalities (Guerneri et al., 1987). Conversely, a substantial number of spontaneous abortions are due to causes other than fetal chromosomal abnormality. We noticed that the incidence of oligomenorrhoea was higher in women who aborted normal karyotyped fetuses than in those who aborted abnormal fetuses. The role of oligomenorrhoea in spontaneous abortions is discussed.

Results

Of the 119 women, 47 (39.5%) showed normal fetal karyotypes (46,XX: 26 cases and 46,XY: 21) and in the remaining 72 (60.5%) the karyotypes were abnormal (trisomies, 47; X-monosomy, nine; polyploidy, 12; structural or other abnormalities, four).

The relationships between fetal karyotype and fetal size, determined by measuring the maximum CRL ultrasonographically, are shown in Table I. Women who suffered abortion without a visible fetal pole (i.e. anembryonic pregnancy) showed the highest incidence of fetal chromosomal abnormalities, and the incidence decreased as the fetal size (CRL) increased. The incidence of oligomenorrhoea in women with normal fetal karyotypes was significantly higher than in those with abnormal ones (34.0 versus 12.5%, \( P < 0.01 \)). Furthermore, it was noted that in the former, smaller fetal size was associated with a higher incidence of oligomenorrhoea. The women with anembryonic pregnancies with normal fetal karyotypes showed the highest incidence of oligomenorrhoea (57.1%). No such relationship was observed in women with abnormal fetal karyotypes

Discussion

This study suggests that oligomenorrhoea itself is associated with sporadic spontaneous abortion, because the incidence of oligomenorrhoea was significantly higher in women whose abortions could not be explained by fetal chromosomal abnormalities than in those whose abortions were attributable to such abnormalities. In particular, oligomenorrhoea was associated with abortions of small fetuses and with anembryonic pregnancies. This association probably reflects the notion that patients with oligomenorrhoea abort at an earlier gestational age than...
women with normal cycles. Hence, nearly 90% (40/46) of the anembryonic pregnancies could be explained either by fetal chromosomal abnormalities or oligomenorrhoea.

In contrast, only half of the (14/28) abortions with fetuses with CRL of 15 mm or more were attributable to these two causes. In a previous study, we found that when recurrent aborters aborted, the prevalence of fetal cardiac activity was greater (i.e. the fetuses were larger) than in women who suffered sporadic spontaneous abortions (Goto et al., 1993). It is possible that abortions with relatively large fetuses may be due to other causes, such as immunological mechanisms (Hill, 1992). Concerning the CRL in abortions, Bessho et al. (1995), in contrast to our results, reported that CRL of the fetus did not discriminate abnormal karyotypes from normal ones. This discrepancy may be derived from the higher frequency of monosomy X and the relatively small sample size of their series.

There are several mechanisms whereby oligomenorrhoea may cause spontaneous abortions. The inadequate corpus luteum function, which frequently accompanies oligomenorrhoea, is one possible mechanism. Quenby and Farquharson (1994) reported that the miscarriage rate in women with oligomenorrhoea was decreased by human chorionic gonadotropin (HCG) administered to support the corpus luteum. In addition, polycystic ovary syndrome (PCOS), the prevalence of which has been estimated to be 22% in normal women of reproductive age, is the most common cause of oligomenorrhoea (Polson et al., 1988). The high luteinizing hormone (LH) concentration which characterizes PCOS may result in impaired oocyte quality due to a mechanism other than chromosomal aberrations either by androgenic milieu within follicles (Regan et al., 1990) or by premature oocyte maturation (Abdulwahid et al., 1985). Hyperprolactinaemia, another common cause of oligomenorrhoea, has also been reported to be associated with spontaneous abortion (Ben-David and Schenker, 1983). Although we did not obtain hormonal data [LH, follicle stimulating hormone (FSH), prolactin] from these women because they were not seen in an infertility clinic, it is likely that PCOS and hyperprolactinaemia, considering their high frequency as mentioned above, may be involved in these abortions.

Quenby and Farquharson (1993) indicated that menstrual irregularity (menstrual cycles lasting longer 35 days), as well as ageing and the number of previous abortions, were high risk factors for any subsequent new pregnancy. Therefore, clinical endocrinological assessment, as well as evaluation for known causes of abortion such as uterine factor (Goldenberg et al., 1995), infectious factor and immunological factor (Berry et al., 1995) should be included for women who abort spontaneously, especially those who suffer recurrent abortions.

### References


Received on April 9, 1996, accepted on August 2, 1996.

### Table I. Incidence of oligomenorrhoea in women who conceived spontaneously but subsequently spontaneously aborted, in relation to fetal karyotype and size. Figures in parentheses are percentages

<table>
<thead>
<tr>
<th>Fetal size</th>
<th>No cases</th>
<th>Percentage with abnormal karyotype</th>
<th>Incidence of oligomenorrhoea</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Normal karyotype</td>
</tr>
<tr>
<td>Anembryonic</td>
<td>46</td>
<td>32/46 (69.6)</td>
<td>8/14 (57.1)*</td>
</tr>
<tr>
<td>CRL &lt; 5 mm</td>
<td>10</td>
<td>12/19 (63.2)</td>
<td>3/7 (42.9)</td>
</tr>
<tr>
<td>CRL ≥ 15 mm</td>
<td>26</td>
<td>16/26 (61.5)</td>
<td>3/10 (30.0)</td>
</tr>
<tr>
<td>Total</td>
<td>119</td>
<td>72/119 (60.5)</td>
<td>16/47 (34.0)</td>
</tr>
</tbody>
</table>

CRL = crown-rump length of the aborted fetuses

*P < 0.05 compared with embryonic pregnancy

^P < 0.01 normal compared with abnormal karyotype.