Prevalence of Hearing Loss in Twin Population

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ABSTRACT

Aims: The primary aim of the study is to determine the prevalence of hearing loss in twin population and to compare the hearing levels of the first and second-born twins. We hypothesized that there is a higher degree of hearing loss among second-born twins. Methods: A retrospective review of twins born with hearing loss at KK Women’s and Children’s Hospital from January 1, 2005 to December 31, 2009 were included. Medical records were reviewed. Hearing test results were reviewed. Analysis was conducted using SAS statistical software version 9.2 (PROC TTEST (paired) and PROC REG, SAS Institute Inc., Cary North Carolina). Results: A total of 913 sets of twins were born from 2005 to 2009. Thirteen sets out of 913 (1.42%) have at least one member with hearing loss. Mean gestational age was 32.19 weeks (SD, ±4.36) and mean birth weight was 1.64 kg (SD, ±0.77). Out of 13 sets, 8 are male twins while 5 are female twins. Nine out of 13 pairs have twin members who both suffer from hearing loss, for the remaining 4 pairs only one member of the pair suffers from hearing loss. All twins with hearing loss have both ears affected. None of the twin members has unilateral hearing loss. Table 1 shows the right and left hearing levels of the first and second-born twins. Analysis of the hearing levels among twins showed no difference in the degree of hearing loss between the first and second-born twins in both the right and left ear. Maternal history was also reviewed which showed only 4 of the 13 sets were conceived through assisted reproductive techniques particularly in vitro fertilization (IVF). The rest are through natural means. In spite of this fact, to our knowledge, there has been no report of prevalence of hearing loss in twins or if twin gestation alone increases the risk of hearing loss. CONCLUSIONS: The aims of this study are to determine the prevalence of hearing loss in twin population and to compare the hearing levels of the first and second-born twins. There is no difference in the degree of hearing loss between the first and second-born twins in both the right and left ear. Risk factors identified that were associated with hearing loss in twins include maternal age and history of neonatal jaundice. A higher maternal age reduces the degree of hearing loss and the presence of neonatal jaundice increases the risk of hearing loss. There were no associations between hearing loss and other factors like method of conception, birth weight, duration of phototherapy and medications such as gentamicin and ampicillin. Discussion: Hearing loss is one of the most common congenital disabilities occurring in 6 to 10 per 1000 newborns.5 In Singapore, results of universal newborn hearing screening showed hearing loss in 4.7 per 1000 newborns.6 Congenital hearing loss may be due to a genetic cause in 50% of cases, acquired in 25% and unknown cause for the rest of the cases. In the study, we found out that hearing loss occurs in 1.4 per 1000 twins. It is lower compared to the reported prevalence in newborns.

CONCLUSIONS

Hearing loss is rare among twins occurring only in 1.4 per 1000 twins. The birth order of twins does not influence the degree of hearing loss. Maternal age is a risk factor that seems to be important risk factors associated with hearing loss in twins. A higher maternal age reduces the risk of hearing loss and the presence of neonatal jaundice increases the risk of hearing loss. However, a larger and well-controlled study is recommended to validate these results.

REFERENCES


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Table 2. Methods of Conception of Twins with Hearing Loss

<table>
<thead>
<tr>
<th>Method</th>
<th>Number of Pairs</th>
<th>Total No. of Twins</th>
<th>Total No. of Twins with Hearing Loss</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural</td>
<td>1204</td>
<td>1204</td>
<td>18</td>
<td>1.5</td>
</tr>
<tr>
<td>Assisted</td>
<td>109</td>
<td>109</td>
<td>5</td>
<td>4.6</td>
</tr>
</tbody>
</table>

Table 1. Hearing Levels of First and Second-born Twins

<table>
<thead>
<tr>
<th>Hearing Level</th>
<th>First-born (n=13)</th>
<th>Second-born (n=13)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>10 (77%)</td>
<td>10 (77%)</td>
</tr>
<tr>
<td>Mild</td>
<td>2 (15%)</td>
<td>3 (23%)</td>
</tr>
<tr>
<td>Moderate</td>
<td>1 (8%)</td>
<td>2 (15%)</td>
</tr>
<tr>
<td>Moderate to Severe</td>
<td>1 (8%)</td>
<td>3 (23%)</td>
</tr>
<tr>
<td>Severe</td>
<td>1 (8%)</td>
<td>3 (23%)</td>
</tr>
<tr>
<td>Total</td>
<td>13 (100%)</td>
<td>13 (100%)</td>
</tr>
</tbody>
</table>

CONCLUSIONS

A study by Pina RP concluded that second-born twin is at increased risk of unfavorable outcome like low birth weight, respiratory distress and lower APGAR score compared to its birth mate. In this study, we compared the hearing levels of the first and second-born twins to determine if the second-born twin is at higher risk of hearing loss. We found no significant difference in the degree or levels of hearing between the first and second-born in both the left and right ear.

CONCLUSIONS

A retrospective review of twins born with hearing loss at KK Women’s and Children’s Hospital from January 1, 2005 to December 31, 2009 was done. Their birth and medical history were reviewed. Hearing test results were recorded. Analysis was conducted using SAS statistical software version 9.2 (PROC TTEST (paired) and PROC REG, SAS Institute Inc., Cary North Carolina).

RESULTS

Twins or multiple pregnancies are no longer considered a rare occurrence due to the increase and widespread use of assisted reproductive techniques particularly in vitro fertilization (IVF). Twin gestation rates are 15-18 per 1000, 15.8 per 1000 and 7-9 per 1000 in western European countries, United States and Singapore respectively.12 Multiple gestation is associated with higher prematurity rate, low birth weight and higher incidence of congenital anomalies and neonatal morbidities such as cerebral palsy, patent ductus arteriosus and respiratory distress.13 In spite of this fact, to our knowledge, there has been no report of prevalence of hearing loss in twins or if twin gestation alone increases the risk of hearing loss.

Aims: The aims of the study are to determine the prevalence of hearing loss in twin population and to compare the hearing levels of the first and second-born twins. We hypothesized that there is a higher degree of hearing loss among second-born twins.

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