Chromosome 10p13-14 and 22q11 deletion screening in 100 patients with isolated and syndromic conotruncal heart defects

R Voigt, M Maier-Weidmann, P E Lange, T Haaf

SUBJECTS AND METHODS

Each patient admitted to the German Heart Centre in Berlin for conotruncal heart malformation was carefully examined by an experienced clinician before cardiac catheterisation. One hundred patients (age range 4 days to 58 years, mean 6.1 years), 81 with isolated CTHD and 19 syndromic cases, were included in this study (table 1). Of the syndromic patients, only one presented classical DGS, one VCFS, one Down syndrome, and two had a positive family history for cardiac defects. Peripheral blood lymphocyte chromosomes were analysed by fluorescence in situ hybridisation. Cosmids Sc11.1a (D22S427), 443 (D22S941/D22S942), 100c10 (COMT), and YAC 966a8 (TUPLE1) all map to the commonly deleted region on chromosome 22q11.18 19 PACs P14-323N1 (D10S585) and P104-204F19 (WI-2389) are from the DGS2 critical region on chromosome 10p13-14.18 19 To detect hemizygosity for 10p13-14 and 22q11, at least 20 metaphases were analysed with each probe for each patient.

RESULTS

Altogether, 22q11 deletions were found in two patients with isolated tetralogy of Fallot (TOF), one patient with TOF and congenital malformation of the thumb, and one patient with truncus arteriosus and thymus aplasia (table 1). In one isolated and the two syndromic cases, cosmids Sc11.1a and 443 were deleted, whereas cos110c10 was present (deletion of proximal DGS1 region). In the second isolated TOF case, cosSc11.1a was present and cos443 and cos100c10 were absent (distal deletion). This is consistent with earlier observations that both deletion size17 and clinical phenotype are variable.18 19 There is no correlation between the severity of the phenotype and the size of the deletion.17 18 19 We did not find a 10p13-14 deletion in the 100 patients studied.

CONCLUSION

Our results suggest that 22q11 microdeletions occur in approximately 2% of patients with isolated CTHD. The incidence of 10p13-14 deletions in patients with isolated and syndromic CTHD appears to be extremely low.

Abbreviations: CTHD: conotruncal heart defects; VCFS, velocardiofacial syndrome; DGS, DiGeorge syndrome; CTAFS, conotruncal anomaly-face syndrome; TOF, tetralogy of Fallot

Table 1 Frequency of 22q11 deletion in 100 CTHD patients

<table>
<thead>
<tr>
<th>Primary diagnosis</th>
<th>Isolated conotruncal defects</th>
<th>Syndromic conotruncal defects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number non-deleted</td>
<td>Number deleted</td>
</tr>
<tr>
<td>TA</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>DORV</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>TGA</td>
<td>22</td>
<td>0</td>
</tr>
<tr>
<td>TOF</td>
<td>28</td>
<td>2</td>
</tr>
<tr>
<td>PA</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td>PS</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
<td>2 (2.5%)</td>
</tr>
</tbody>
</table>

YAC 966a8 (TUPLE1) all map to the commonly deleted region on chromosome 22q11.18 19 PACs P14-323N1 (D10S585) and P104-204F19 (WI-2389) are from the DGS2 critical region on chromosome 10p13-14.18 19 To detect hemizygosity for 10p13-14 and 22q11, at least 20 metaphases were analysed with each probe for each patient.
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