Heart defects are among the most common congenital anomalies, occurring in approximately 1% of newborn populations. Conotruncal heart defects (CTHD), which account for 50-60% of all congenital heart malformations, are known to have a strong genetic component. They occur either as an isolated malformation or in association with extracardiac anomalies. In particular, CTHD constitute a cardinal component of branchial arch syndromes, such as DiGeorge syndrome (DGS), velocardiofacial syndrome (VCFS), and conotruncal anomaly-face syndrome (CTAFS). The wide phenotypic spectrum includes cardiac defects, abnormal facies, thymic hypoplasia or aplasia, cleft palate, and hypoparathyroidism. The presence of a characteristic 3 Mb microdeletion on chromosome 22q11 in 70-90% of these patients indicates a common genetic aetiology. Haploinsufficiency for the Tbx1 transcription factor in the critical region appears to be responsible for the aortic arch defects in these disorders. The 22q deletions also occur in a high percentage (10-40%) of syndromic cases (CTHD associated with at least one extracardiac anomaly) and in non-syndromic familial cases. Although 22q11 microdeletions in a few patients with isolated CTHD have been reported, their exact prevalence remains unknown. In most studies, no 22q11 deletions were found in isolated cases. One possible explanation may be that variant deletions occur in >10% of 22q11 deletion patients and the detection rate of different probes used for microdeletion screening may vary. On the other hand, 22q11 deletion patients who were originally diagnosed as isolated may have been classified retrospectively as syndromic, because of subtle (facial and other) dysmorphism upon re-examination. A second critical region for CTHD exists on chromosome 10p13-14. However, the incidence of 10p13-14 deletions in DGS/VCFS patients is much lower than that of the classical 22q11 deletion. The few patients with 10p13-14 deletions described so far were all severely affected, so they are likely to represent a special subset. A 10p13-14 deletion in the 100 patients studied. We did not find 10p13-14 deletions in 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 size and clinical phenotype are variable. There is no correlation between the severity of the phenotype and the size of the deletion.

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 size and clinical phenotype are variable. There is no correlation between the severity of the phenotype and the size of the deletion. 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; CTA FS, conotruncal anomaly-face syndrome; TOF, tetralogy of Fallot

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**Table 1**

<table>
<thead>
<tr>
<th>Primary diagnosis</th>
<th>Isolated conotruncal defects</th>
<th>Syndromic conotruncal defects</th>
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<tr>
<td></td>
<td>Number non-deleted</td>
<td>Deleted</td>
</tr>
<tr>
<td>TA</td>
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<td>0</td>
</tr>
<tr>
<td>DORV</td>
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<td>0</td>
</tr>
<tr>
<td>TGA</td>
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<td>0</td>
</tr>
<tr>
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</tr>
<tr>
<td>PS</td>
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<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
<td>2 (2.5%)</td>
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