Incidence of retinoblastoma in the Bantu of South Africa

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There is no report on the incidence of retinoblastoma in the Bantu of South Africa. The incidence of any disease entity in a population often lends a clue to its aetiology and this forms an important part in the epidemiological study of the disease entity. This also applies to the study of neoplastic conditions and, as regards this report, to retinoblastoma in particular. The patients reported in this study all came from the Johannesburg area of South Africa and were seen mainly at the St John Eye Hospital, Baragwanath, during the 20-year-period from 1955 to 1976.

Clinical study

The patients were classified according to age, sex, and uniconal or binocular involvement.

Results

During the 20-year-period a total of 78 new cases of retinoblastoma were seen. This represents an average of just under four new cases each year. The birth rate derived from hospital clinic and census figures in the area from which the cases came is 40 000 live births a year. The incidence of retinoblastoma in the Bantu from this area is one per 10 000 live births.

The age and sex distribution of retinoblastoma were calculated for 71 patients (Table), but the ages of the remaining seven patients were unobtainable.

Nearly half of the children with retinoblastoma were in the two- to three-year age groups, while an equal number of children appeared in both the one- to two- and four-year age groups. Of the total number of patients (78), 64 had one eye involved and 14 had both eyes involved. The average age of the binocular cases at presentation was three years, and for the uniconal cases at presentation it was 3½ years. The ratio of boys to girls in the uniconal cases was 1:2:1 and in the binocular cases 3:1. In this series the ages of presentation were known in 71 cases. Of these, 80 per cent were diagnosed before the age of four years. The tumour had spread in 45 out of the 78 cases; in these it was poorly differentiated and had spread either well into the optic nerve, the orbit, the brain, or to bone. Only 13 per cent of these cases were binocular.

Table Age and sex distribution of 71 patients

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1-2</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>2-3</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>3-4</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>31</td>
</tr>
</tbody>
</table>

Discussion

In this series 80 per cent of cases were diagnosed before the age of four years. This corresponds with the findings of Taktikos (1966), and Tarkkanen and Tuovinen (1971). The series in the Bantu showed a moderate preponderance of males. This corresponds with the findings of Bech and Jensen (1961), Carabajal (1958), and Herm and Heath (1956). Tarkkanen and Tuovinen (1971) in their series demonstrated a slight preponderance of females (91 out of 71). The sexual incidence in the Bantu would therefore seem to coincide well with the incidence found in other series dealing mainly with Caucasoid populations. In a series (Sevel, Sealy, and Lawton, 1973) reported from Groote Schuur Hospital, South Africa, the sex ratio was similar to that of our series—that is, 40 males and 31 females—however, their race was not mentioned, but the comparison seems to imply that the numbers of patients seen in the Transvaal area are similar to those seen in the Cape area during a 20-year-period.

In our series 82 per cent had uniconal involvement and 18 per cent binocular. In other reported series, dealing mainly with Caucasoid populations, bilateral involvement varied from 30 to 50 per cent—for example, Carabajal (1958) 30 per cent, Jensen (1965) 30 per cent, Lommatzsch (1966) 59 per cent. Bilateral involvement was observed in 19·3 per cent of the 1760 cases on file in the Registry of Ophthalmic Pathology (Zimmerman, 1969). Thus it seems that binocular involvement in the Bantu is at the lower end of the scale of reported binocular incidence of the tumour. In a recent report dealing
with 61 cases of retinoblastoma (Devesa, 1975), 50 were uniocular with a slight female preponderance.

In this series, 65 per cent of the uniocular cases showed that the tumour had spread resulting in a poor survival rate. There appeared to be a direct relationship between the time of presentation and the histology of the tumour, late presentation being associated with more advanced anaplastic appearance of the tumour. Herm and Heath (1956) suggest that the longer the tumours are present before presentation the less differentiated they seem to be histologically. Carbajal (1958) showed that the fatality rate was less when the duration of symptoms before treatment was two weeks to six months than when duration was more prolonged.

These observations seem to apply to this series in the Bantu and the anaplastic appearance in most of the Bantu cases was due to the longer existence of the tumour before presentation. Tumours seen in the Bantu at a relatively early stage showed the presence of typical rosettes, thus the retinoblastomas do not appear to be more aggressive in the Bantu. No family history was obtained in any of the patients in this series, unlike other reported series in which family history varied from 11 to 44 per cent (Carbajal, 1958; Pieroni, Lashmet, and Helveston, 1969).

Conclusions

It would seem from this study that the incidence per live birth of retinoblastoma in the Bantu is higher than that reported in series dealing with Caucasoids or series not specifying race.

The sexual difference is not significantly marked but there is a slight preponderance of males in the Bantu.

The average age of presentation of 3 to 3½ years corresponds well with that reported in other series.

The severity of the tumour in the Bantu appears to be because of late presentation of the patient to the hospital.

No family history was obtainable in any of the 78 cases.

Thus retinoblastoma in the Bantu is not an infrequently occurring tumour as has been reported, but is, in fact, more common than retinoblastoma reported in other series. Apart from the incidence, the pathological behaviour of the tumour in Bantu is very similar to that of retinoblastoma reported in other series most of which are predominantly in Caucasian populations.

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References

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