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Editorials

Screening for neuroblastoma in children

Neuroblastoma is the third most common tumour among children after leukaemias and brain tumours.[1] The annual age standardised incidence rates have risen in Great Britain from 7·7 per million population in 1971–75 to 9·7 in 1986–90 (fig 1).[2] It is implausible that improved diagnosis could explain the increase in rates since 1971, though it may account for the decrease in recorded incidence at the age of 10–14. Survival rates for neuroblastoma in Britain have increased substantially during 1971–85, with five year actuarial survival rates being 15% in children diagnosed in 1971–73 rising to 43% in 1983–85.[3] Despite this increase in survival the age standardised mortalities have fallen only slightly from 6·2 per million population in 1971–75 to 5·3 in 1986–90 (fig 2),[2] owing to the increase in incidence.

Neuroblastoma in children is a tempting candidate for screening: children who present clinically with neuroblastoma before the age of 1 year have a much better prognosis than those presenting at a later age (fig 3).[4] Also, at any age children with advanced stage of disease have a much poorer prognosis than children with less advanced disease stage (fig 4).[4] Moreover, more than 90% of patients presenting clinically with this tumour excrete acid catecholamine metabolites in higher than normal amounts.[5] These metabolites can be easily measured in random urine samples obtained by blotting wet nappies (diapers) with filter paper and sending the filter paper to a laboratory for analysis. This method has been shown to be suitable for mass screening.[6] Thus it is possible to screen asymptomatic children under 1 year of

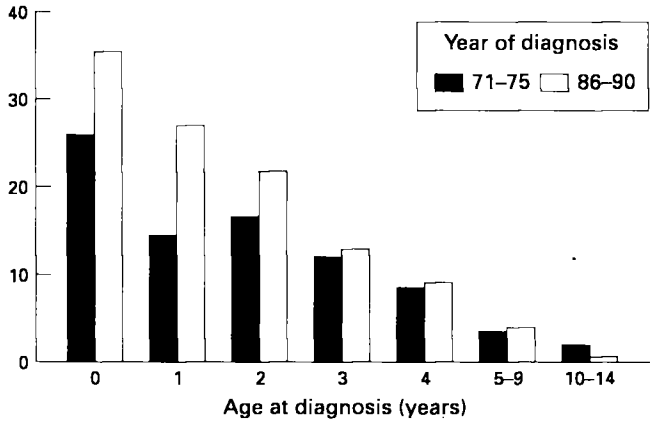

Figure 1 Incidence of neuroblastoma per million population in Great Britain, 1971–75 and 1986–90. Prepared using data from reference 2.

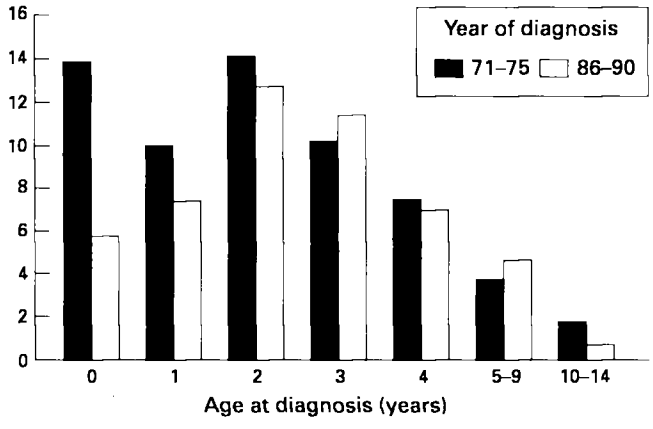

Figure 2 Mortality from neuroblastoma per million population in Great Britain, 1971–75 and 1986–90. Prepared using data from reference 2.

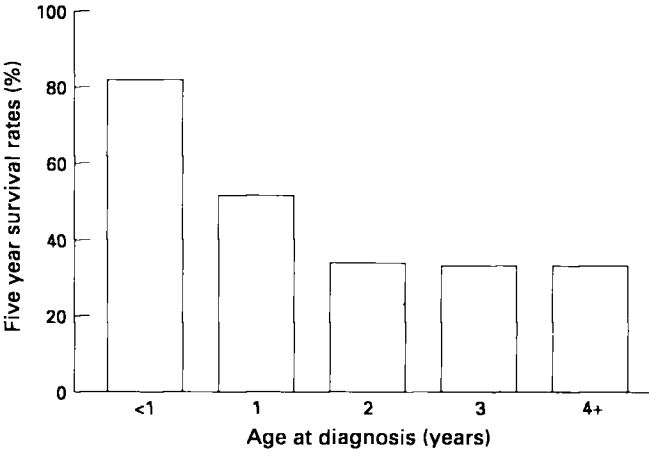

Figure 3 Survival of neuroblastoma by age at diagnosis (years). Prepared using data from reference 3.

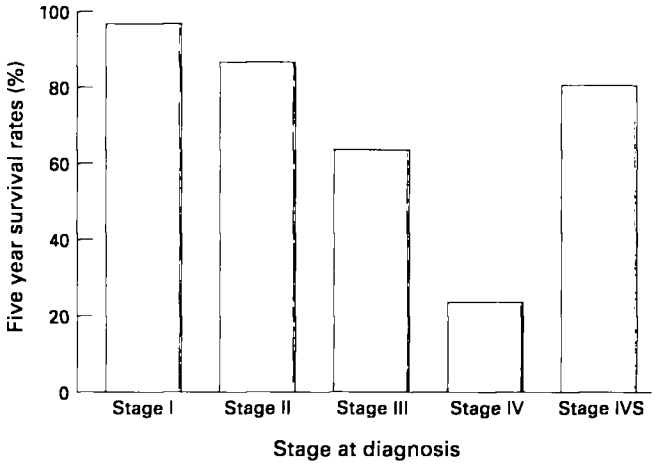

Figure 4 Survival of neuroblastoma by stage at diagnosis. Prepared using data from reference 3. Stage I: Unilateral localised tumour which has been completely excised: no nodal involvement. Stage II: Unilateral tumour, not completely excised: with or without nodal involvement. Stage III: Midline tumour with or without involved nodes; or unilateral tumour with contralateral nodal involvement. Stage IV: Disseminated tumour with metastases in various sites including bone. Stage IVS: Unilateral tumour as in stages I or II, with dissemination limited to liver, skin, or bone marrow, and excluding bone metastases.

age and detect early stage neuroblastoma with the hope of improving their prognosis.

There are problems, however. Early detection and potential benefits are not enough. It has been found that some neuroblastoma tumours may regress spontaneously.[7] Also reports from screening programmes in Japan have suggested an increased incidence of neuroblastoma after screening, indicating, possibly, the detection of regressing tumours.[8] The screening programme in Japan also suggests that the tumours detected at screening are those destined to have a favourable outcome regardless of early or late detection. The missed (interval) cases are those with poor prognostic features.

Feasibility studies of neuroblastoma screening are underway in France, Austria, Germany, Italy, Norway, the United States, and Australia. However, only in North America is any formal attempt at evaluating the efficacy of neuroblastoma screening being made by observation of mortality. Professor Chamberlain, in her paper "Screening for neuroblastoma" (page 169), reviews the evidence of potential benefits and hazards of screening for neuroblastoma in children. This paper establishes that there are insufficient data to recommend screening for neuroblastoma. More evidence is needed and the results from a large North American trial may be helpful, but it is not a randomised trial and there may be difficulties in interpretation.

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