

## EFFECTS OF EARLY CHILDHOOD POSTERIOR FOSSA TUMOURS ON IQ

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**Objective** IQ deficits have been reported amongst survivors of early childhood brain tumours, with iatrogenic causes commonly being associated with these deficits. In this study we examined IQ scores and their associations in adult survivors of an early childhood posterior fossa brain tumour (PFT).

**Method** 113 people who had brain tumours under the age of 5 years had their IQ assessed using the Wechsler Abbreviated Scale of Intelligence (WASI). They were assessed an average of 32 years (range 18–53) after their initial tumour diagnosis. 62 of their siblings were also assessed and used as a comparison group.

**Results** Overall, 16.1% of survivors had an FIQ below 70, indicating a learning disability, compared to none of the sibling control group. Mean FIQ in survivors was 89, compared to 107 in siblings. Post-hoc analysis of matched controls (n=62) were conducted. Using sibling IQ as a marker for the survivor's premorbid IQ, a significant decline in FIQ of an average of 19 points was seen as a result of PFT and its treatment. For those who received radiotherapy this increased to 24 points. For those who did not receive radiotherapy this decline was 10 points. In survivors, but not in siblings, FIQ was related to height. In survivors, there was a significant gender difference between men and women on FIQ ( $t=2.47$ ;  $df=110$ ;  $p=0.015$ ), VIQ ( $t=1.99$ ;  $df=111$ ;  $p=0.049$ ) and PIQ ( $t=3.12$ ;  $df=109$ ;  $p=0.002$ ), with females having lower scores. In siblings there was no significant gender difference on any IQ scale. In survivors, radiotherapy was associated with a significant reduction in FIQ, VIQ and PIQ. There was no significant difference on IQ of having received or not received chemotherapy. There was a significant interaction between gender and radiotherapy on FIQ, with females who had radiotherapy having lower IQ than males who had radiotherapy ( $F=4.05$ ;  $p=0.049$ ).

**Conclusion** Results suggested that early childhood PFT can result in significant decline in IQ, and that this decline is increased by use of radiotherapy, and may be more marked in females who had radiotherapy compared to males who had radiotherapy. Other factors, including growth hormone deficiency may influence the relationship between PFT and IQ, as suggested by the significant relationship between height and IQ.