in children. The authors (1,2) argue that the increased incidence relates to improved diagnostic techniques. I believe that they overlooked two critical points. Malignant brain tumors of childhood are not silent diseases. If indeed there was an increased sensitivity to diagnosis made in 1984, certainly in the subsequent 10-year interval, those cases that may have been missed would have become clinically evident. This point was not made by either the editorial or the article. Secondly, there is a diminishing, albeit very slight, mortality, and this may be attributable to the considerable improvements that have been made in neurosurgical techniques during this period. The fact that the mortality has not diminished further argues for an increasing incidence.

The Journal highlighted the article by Smith et al. by having an editorial written that states that we should be better off not seeking reasons for this increasing incidence and rather that we should place our efforts elsewhere. This emphasis is all the more troubling to me, since this article appeared in the popular media, in both newspapers and television.

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REFERENCES


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RESPONSES

Dr. Forman believes that I overlooked two critical points in my editorial on the reported incidence of primary malignant tumors in children, the first point being that these tumors are not silent. However, even if this point is completely true and all magnetic resonance imaging (MRI)-detectable brain tumors would produce clinical manifestations within 10 years of detection, the reported incidence should increase with the use of MRI. As I pointed out in my editorial, there are published accounts of cerebral tumors being misdiagnosed as idiopathic epilepsy and brain stem tumors being misdiagnosed as aqueductal stenosis and even asthma. Such misdiagnoses are much less likely to occur in patients who have had a brain MRI, and a decrease in misdiagnosis is probably partially responsible for the reported increase in incidence.

In addition, Dr. Forman’s first point is not completely true. As I argued in my editorial, some of the smaller tumors detectable by MRI—particularly the focal low-grade lesions (1) in the brain stem—may remain asymptomatic throughout childhood and possibly even throughout a normal life span. This lack of symptoms should not be surprising. During the past few decades, advances in testing have led to a dramatic increase in the detection throughout the body of tumors that have a histologic appearance of malignancy. In general, “malignant” tumors detected incidentally or by screening are much less aggressive than their symptomatic counterparts (2–5). Although almost all children with a primary malignant brain tumor detected by MRI have some symptoms that prompted the examination, in some cases the symptoms and tumor may be unrelated.

Dr. Forman’s second point is that the slight decrease in the mortality from primary malignant tumors in children is evidence for an increase in its incidence. This reasoning, however, is based on the assumption that treatment has become more effective. While this is possible, it cannot be reliably inferred from historical comparisons of survival, precisely because of the dramatic advances in MRI (6).

Finally, I did not say that we should ignore the reported increase in incidence but rather that we “should not panic or be quick to point blame” at a suspected etiologic agent when the reported increase can be easily explained by increased detection. As I pointed out, a real, coincidental increase in incidence cannot be completely excluded, but neither can a real, coincidental decrease.

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We appreciate the opportunity to respond to Dr. Forman’s concerns. We agree with Dr. Forman that many childhood brain cancers manifest in a clinically significant manner within a short time after initial symptoms are noted. Medulloblastoma typifies the aggressive brain cancers in children, with relentless progression of symptoms over a relatively brief period. On the other hand, as described in our article (1), some of the low-grade gliomas of childhood can have a much more indolent course (2,3). Of note, the incidence of medulloblastoma remained essentially constant for the period from 1977 to 1994, while the incidence of low-grade gliomas increased.

Contrary to Dr. Forman’s letter, we offered four possible explanations for the increase in incidence of childhood brain cancer that occurred during the mid-1980s: 1) increased ability to detect brain cancers, particularly low-grade gliomas, as a result of diagnostic application of magnetic resonance imaging (MRI); 2) changes in histologic classification of brain tumors that occurred in the years around 1984–1985 (4); 3) changes in neurosurgical practices (e.g., stereotactic biopsies) in the mid-1980s that might have led to increased diagnosis and reporting of childhood brain tumors (5,6); and 4) a true increasing incidence in childhood primary malignant brain tumors that occurred over this brief period of time. We do believe that further research is warranted to better understand the relative contributions of each of these potential causes for the increase. Specifically, we suggested that work should be directed toward defining the characteristics of the tumors of the brain stem and cerebrum that appear to account for much of the increase in reported incidence in the mid-1980s.

Dr. Forman states that, given the considerable improvements in neurosurgical technique, the fact that brain cancer mortality rates have not diminished further argues for an increasing incidence. However, the mortality rate has decreased at a constant rate over the past 20 years with no evidence of any perturbation during the mid-1980s, which was the period during which childhood brain cancer incidence jumped to a higher level. Given the absence of remarkable advances in the treatment of childhood brain cancers in the mid-1980s, this pattern of a jump in incidence combined with constantly declining mortality supports the hypothesis that the observed increase somehow resulted from changes in detection and/or reporting of childhood primary malignant brain tumors during the mid-1980s.

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