International Adoption, “Early” Puberty, and Underrecorded Age

Internationally adopted children appear to reach puberty at a relatively young age\(^1\) and to have a high risk of early puberty including very early or precocious puberty (PP), that is, pubertal development at \(<8\) years of age for girls and at \(<9\) years of age for boys.\(^2,3\) However, there can be uncertainty over the chronological age of adopted children, raising the possibility that the seemingly elevated risk of early puberty is due to some children having a significantly under-recorded age, perhaps of up to 2 years or more. If a child’s birth date is unregistered and relatives are uncertain, or if the child is abandoned, an age will need to be determined to complete adoption formalities. There is no certain method of determining a child’s age, which makes errors in either direction possible. However, it may be suspected that underestimates are more likely than overestimates, either to facilitate placement with adoptive parents, who tend to favor younger children, or because neglected and malnourished children will be less advanced and smaller than the typical child of their age.

Researchers into early puberty freely admit that there is an element of uncertainty over birth dates; 1 study reported that a child who entered the recipient state apparently aged 5 years and who later developed early puberty may have been 2 or 3 years older than his recorded age\(^4\); another classified 25.4\% of internationally adopted girls as having an uncertain date of birth.\(^1\) Nonetheless, most researchers have tended to discount underrecorded age as a systemic explanation of the elevated risk of early puberty in favor of theories that assume that, in most cases at least, they are dealing with a genuine diagnosis. However, I would argue that some of the puzzling findings uncovered by the research, on age at adoption, catch-up rates, final height, and height after treatment to delay puberty, can be explained by under-recorded age. Other findings have rendered other theories problematic so that, overall, underrecorded age provides a better explanation of the research evidence than do the alternatives.

It has been found that the older the recorded age at adoption the higher the risk of early puberty.\(^5\) Conversely, very young children at adoption are at little or no increased risk of early puberty. Children adopted into Denmark from Korea were found to have no increased risk of PP. Ninety-nine percent of these children were \(<2\) years or \(<1\) year of age on arrival in Denmark (both figures are given).\(^5\)
If underrecorded age explains early puberty, this finding is to be expected. The gap between the lowest age that could plausibly be assigned to a child and their true age increases as the child gets older. An infant is unmistakable, and it would be much more difficult to make a mistake or to otherwise maintain that a child with a true age of, say, 3 years was only 1 year than it would be to maintain that child whose true age was 5 years was only 3 years. Therefore, the older the recorded age of the child at adoption the greater the potential gap between their age on paper and their chronological age, and hence the greater the apparent risk of early puberty.

After adoption, children whose height has been adversely affected by malnutrition will catch up to their height potential for their age. Early puberty has been associated with children who show the fastest catch-up in height. This finding is consistent with underrecorded age because those who have the greatest gap between their recorded age and older chronological age will also tend to have the greatest gap between their height and their height potential.

Nonadopted children with PP are liable to have a reduced final height. However, the final heights of internationally adopted children with PP are similar to heights attained in their country of origin. In addition, when internationally adopted children have been treated with gonadotropin-releasing hormone agonists to delay puberty, it is uncertain whether this treatment has resulted in any increase in height; it may have made the children shorter than their expected height. Gonadotropin-releasing hormone agonist treatment has a limited impact on increasing the final height of children aged >8 years, but it can have an impact on children <8 years of age experiencing rapid puberty. If the age of the child has been significantly underrecorded, a lack of height gain is to be expected.

On the assumption that the high rate of early puberty is genuine, researchers have hypothesized that it is caused by nutritional deprivation before adoption followed by catch-up after adoption. This theory is said to gain support from a limited experiment on male rats, although there is no evidence that it extends to nonadopted children who have recovered from postnatal undernutrition. The theory has been made problematic by the finding, first reported in a Belgian study, that children not underweight or only slightly underweight at the time of their adoption have gone on to develop PP. The Belgian researchers proposed an alternative theory that early puberty is caused by endocrine disrupters and in particular by high levels of a pesticide found in both internationally adopted and nonadopted migrant children with PP. A high PP risk among children who migrate with their parents would invalidate the underrecorded age theory because there is little reason to doubt their age. However, a later Danish study revealed no increased risk of PP among migrant children, suggesting that environmental chemical exposure in the state of origin is not a factor.

A Spanish study cast additional doubt on both the pesticide and catch-up theories. It corroborated the Danish finding that migrant children are not at increased risk of PP, but it also corroborated the Belgian finding that children who have received sufficient nutrition before adoption can also be at risk of PP. Children adopted domestically in Spain, who were adequately nourished before adoption, had a PP risk 18 times higher than that in nonadopted children. In light of their findings, the Spanish researchers proposed that psychological factors influence PP. Childhood stressors have been linked to pubertal timing, so this factor remains a possible explanation of early puberty for older adopted children.

If birth records, for example, hospital records, could be shown to be accurate for a cohort of deprived children adopted at an older age, one could undertake a critical test of underrecorded age against both catch-up and childhood stressor explanations. Depending on the nature of the deprivation, either or both of these theories would predict a high incidence of PP, whereas underrecorded age would not. Nationality could possibly be used to define this cohort, because national variations in the accuracy of birth records may help to explain why adopted children from some states of origin, such as India, appear much more frequently than others in patient studies of early puberty. Given the potential for local variation in birth record accuracy, however, the underrecorded age theory could also be assessed by investigating the background of individual children with apparent early puberty alongside the age-determination practices of the agencies that placed them. Domestic adoption and PP in Spain could be similarly investigated.

All of these investigations require transdisciplinary research. The research to date, however, has been largely driven by the effort to come to a better understanding of the onset of puberty rather than the context of adoption, with a notable absence of curiosity over how either adoption practices or social, cultural, and bureaucratic norms in different states of origin may impinge on the reliability of birth dates. This reluctance to cross disciplines may help to explain why underrecorded age has received comparatively little attention despite the evidence in its favor and the questions that this raises over treatment.
REFERENCES


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Peter Hayes

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