

- 1 European Collaborative Study. Risk factors for mother-to-child of HIV-1. *Lancet* 1992;339:1007-12.
- 2 Dunn DT, Newell ML, Ades AE, Peckham CS. Risk of human immunodeficiency virus type 1 transmission through breast feeding. *Lancet* 1992;340:585-8.
- 3 Van de Perre P, Simonon A, Msellati P, Hitimana D-G, Vaira D, Bazubagira A, *et al*. Postnatal transmission of human immunodeficiency virus type 1 from mother to infant. A prospective cohort study in Kigali, Rwanda. *N Engl J Med* 1991;325:593-8.
- 4 Grant J. *State of the world's children* 1992. New York: UNICEF Oxford University Press, 1992.
- 5 Howie PW, Forsyth JS, Ogston SA, Clark A, Florey C du V. Protective effect of breast feeding against infection. *BMJ* 1990;300:11-6.
- 6 Cunningham AS. Morbidity in breast and artificially fed infants. *J Pediatr* 1979;95:685-9.
- 7 Scrimshaw NS, Taylor CE, Gordon JE. *Interactions of nutrition and infection*. Geneva: World Health Organisation, 1968. WHO Monograph 57.)

- 8 Victoria CG, Smith PG, Vaughan JP, Nobre LC, Lombardi C, Texeira AMB, *et al*. Evidence for protection by breast-feeding against infant deaths from infectious diseases in Brazil. *Lancet* 1987;iii:319-22.
- 9 Habicht J-P, DaVanzo J, Butz WP. Mother's milk and sewage: their interactive effects on infant mortality. *Pediatrics* 1988; 81:1305-9.
- 10 Heymann SJ. Modelling the impact of breast-feeding by HIV-infected women on child survival. *Am J Public Health* 1990;80:1305-9.
- 11 Hu DJ, Byers R, Nkowane BM, Heyman DL. A comprehensive decision analysis model to compare the mortality associated with HIV transmission from breast-feeding with the mortality from not breast-feeding in different populations [abstract]. *VIII International conference on AIDS, Amsterdam*, 1992; (in press).
- 12 Global Programme on AIDS. Consensus statement from the WHO/UNICEF consultation on HIV transmission and breast-feeding. *Weekly Epidemiol Rec* 1992;67:177-84.

## Towards a separate adolescent medicine

### *Do one billion teenagers worldwide deserve their own specialty?*

The first attempt to organise the clinical care of adolescents occurred in Britain with the establishment of the Medical Officers of Schools Association in 1884.<sup>1</sup> While Britain took the initiative, others carried the idea further. How much further is evident from this year's presidential address to the Society for Adolescent Medicine in Washington. "The scope of adolescent issues has been sketched out," said Dr Karen Hein. "Our discipline is now defined and is board certifiable. Our training programmes and continuing education courses are replete with the fundamentals of our specialty. Now it's time to put more of our efforts into speaking out for the youth we serve."<sup>2</sup>

Several arguments exist for a separate specialty for adolescents. Although paediatric mortality has fallen substantially and life expectancy increased among the geriatric population in North America, mortality among teenagers has remained virtually unchanged for 30 years. Motor vehicle accidents (usually alcohol related) are the main cause of death among adolescents, with more deaths per driver aged 18 than for any other age.<sup>3</sup> Suicide causes the second highest number of deaths, and the rate among teenagers and young adults has increased fourfold since 1960.<sup>4</sup> In England and Wales the rate of suicide among males aged 14 to 24 increased by 78% between 1980 and 1990.<sup>5</sup>

The number of teenage pregnancies increases: among western industrialised nations Britain is second to the United States in teenage pregnancy rates.<sup>6</sup> In all of these countries we are witnessing an epidemic of sexually transmitted disease, including AIDS. About one in five North American patients with AIDS is aged 20 to 30. If the latent period between infection and clinical disease averages seven to 10 years then many people must have been infected during their teens.<sup>7</sup> In 1988 AIDS was the sixth leading cause of death among 15 to 24 year olds in the United States.<sup>8</sup>

Experimentation with drugs such as marijuana, amphetamines, hallucinogens, and cocaine (chiefly as "crack") continues to be part of the rites of passage through adolescence for a substantial number of teenagers and a way of life for an appreciable minority. This use of drugs contributes substantially to fatal car accidents and suicide. The loss of inhibition and judgment that drugs induce increases sexual risk taking and furthers the spread of sexually transmitted diseases and AIDS.

When considering the scope of adolescent medicine it should not be forgotten that about three quarters of the world's billion teenagers live in developing countries.<sup>9</sup> Because of poverty and the hopelessness that it engenders about 100 million teenagers are living on the streets in these countries,<sup>10</sup> and they are at much greater risk of AIDS and violent death.

Chronic illnesses also affect increasing numbers of teenagers as medical science deals more effectively with illness that used to kill in utero, at birth, in infancy, and in childhood. Not only do conditions such as cystic fibrosis, haemophilia, or chronic renal disease present complex challenges to schooling and career development, but these teenagers must also deal with the burden chronic illness adds to the normal adolescent struggle for self esteem.

Work from North America has shown that the development of a specialty of adolescent medicine has augmented primary care efforts in this age group. Examples include the development of programmes to care for runaway youths, teenage prostitutes, and substance misusers.<sup>11</sup> Although these patients demand more commitment than most devoted general practitioners can give, primary care doctors working alongside adolescent specialists have contributed substantially to their care. Adolescent clinics held in schools and settings where homeless teenagers congregate are evolving in many North American cities. These efforts are meeting many teenagers' preference for treatment away from their usual family or community clinic.

A paper recently published by the *BMJ* showed how effectively general practitioners can perform in adolescent health care. Two encouraging outcomes emerged from a study of adolescent smokers by Townsend and colleagues.<sup>12</sup> These were that the participation rate among teenagers who were canvassed was 73%—higher than the group's experience with adults—and 60% of those who smoked regularly were willing to enter into a smoking cessation agreement with a doctor or nurse. Interestingly, many of the teenagers who had agreed to participate in the study had lost contact with the practice and both they and their doctors appreciated the reacquaintance.

Infants and children have their paediatric advocates, elderly patients have their geriatricians. Both of these groups of specialists have advanced primary care medicine with insights that have now become part of standard care. Similarly, adolescent specialists need continually to bring their clinical experience and research findings back to primary care doctors. Primary care doctors in Britain are clearly aware of adolescent health problems already. The North American experience strongly suggests that a specialty of adolescent medicine in Britain would help to further their efforts.

MICHAEL MALUS

Associate Professor of Family Medicine and Paediatrics,  
McGill University School of Medicine,  
Herzl Family Practice Centre,  
SMBD-Jewish General Hospital,  
Montreal H3T 1Z6,  
Canada

- 1 Heald F. Foreword. In: Friedman SR, Fisher M, Schonberg SK, eds. *Comprehensive adolescent health care*. St Louis, Missouri: Quality Medical Publishing, 1992:xv.
- 2 Hein K. Turning adolescent medicine inside out. *Journal of Adolescent Health* 1992;13:436-41.
- 3 Neinstein LS. *Adolescent health care. A practical guide*. Baltimore: Urban and Schwarzenberg, 1991:89.
- 4 Strasburger VC, Brown RT. *Adolescent medicine: a practical guide*. Boston: Little, Brown 1991:420.
- 5 Hawton K. By their own young hand. *BMJ* 1992;304:1000.
- 6 Guilbert E, Forget G. Teenage pregnancy in Canada and Quebec. *Canadian Family Physician* 1992;37:1184-91.
- 7 Futterman D, Hein K. AIDS and HIV infection. In: Friedman SR, Fisher M, Schonberg SK, eds. *Comprehensive adolescent health care*. St Louis, Missouri: Quality Medical Publishing, 1992:551.
- 8 Mackenzie RG, Kipke MD. Substance use and abuse. In: Friedman SR, Fisher M, Schonberg SK, eds. *Comprehensive adolescent health care*. St Louis, Missouri: Quality Medical Publishing, 1992:770.
- 9 Ransome-Kuti O. Keynote address at the fifth congress of the International Association for Adolescent Health. *Journal of Adolescent Health* 1992;13:342-4.
- 10 Cajetan Luna G. Street youth: adaption and survival in the AIDS decade. *Journal of Adolescent Health* 1991;12:511-4.
- 11 Yates GL, Pennbridge J, Swofford A, Mackenzie RG. The Los Angeles system of care for runaway/homeless youth. *Journal of Adolescent Health* 1991;12:555-60.
- 12 Townsend J, Wilkes H, Haines A, Jarvis M. Adolescent smokers seen in general practice: health, lifestyle, physical measurements and response to anti smoking advice. *BMJ* 1991;303:947-50.

# Delayed puberty

## Many good arguments to treat

Constitutional delay of puberty and growth occurs in otherwise normal adolescents with no underlying illness who have relatively short stature associated with delayed puberty, delayed epiphyseal maturation, and a height prognosis appropriate for their parental centiles.<sup>1</sup> Because it is a variant many doctors have been reluctant to treat it.

The diagnosis of constitutional delay of growth and puberty should be made on anthropometric grounds as biochemical assessment is often misleading in delayed puberty<sup>2</sup> and such patients require practical help rather than intensive investigations. When the diagnosis is in doubt, especially in the presence of extreme short stature and rapidly decelerating growth, the opinion of a paediatric endocrinologist should be sought.

Spinal growth is relatively delayed compared with leg length during the pubertal growth spurt, and normal boys experience a stage of development with relatively long legs before attaining normal adult proportions.<sup>3</sup> Whether children with untreated constitutional delay of growth and puberty attain their optimal height has recently been disputed.<sup>4,5</sup> Interestingly, adults who did not receive treatment for constitutional delay of growth and puberty had relatively short spinal length compared with leg length.<sup>4,5</sup> Indeed at presentation of constitutional delay this sign of segmental disproportion is so reliable that its absence points to an alternative diagnosis.

Psychological problems are common in children with delayed puberty and short stature, especially in boys.<sup>6</sup> So far these problems have been the only indication for therapeutic intervention. In clinical practice boys more commonly present with constitutional delay of growth and puberty than girls for social reasons and possibly because of the sensitivity of the gonadotroph to endogenous gonadotrophin releasing hormones.<sup>7</sup> Their symptoms may be particularly distressing; deviant behaviour and severe psychological problems may result. These may interfere with education at a time when academic achievement is of lifelong importance, and the deviant behaviour may be so severe that it causes problems with the law (such as shoplifting and vandalism) or even results in suicide.

Intervention with sex steroids<sup>8,9</sup> or anabolic steroids<sup>10,11</sup> is an effective and safe treatment which brings forward the timing of the growth spurt without decreasing the height potential. Much lower doses of these therapeutic agents should be used than were commonly used in the 1950s and 1960s.<sup>9,11</sup> High dose regimens may be counterproductive by inducing psychological disturbance and also causing rapid epiphyseal maturation and reduced final height.

Recent data, using bone densitometry, have now suggested the risk of osteoporosis as another important reason for treating substantially delayed puberty. Studies in men whose constitutional delay of growth and puberty was untreated showed significantly reduced mineral density of the spine<sup>12</sup>—putting them at greater risk of fractures at later life. Peak spinal bone density is achieved at a relatively young chronological age—15 years in girls and 17 years in boys.<sup>13</sup> Androgen treatment does not normalise spinal bone density in men with hypogonadotrophic hypogonadism,<sup>14</sup> which emphasises the importance of the timing of the secretion of sex steroids in the normal pubertal age range.<sup>14</sup>

Should constitutional delay of growth and puberty be regarded as a disorder rather than a normal variant? The prevention of osteoporosis and the attainment of appropriate skeletal proportions may be added to psychological disturbance as indications for the treatment of constitutional delay of growth and puberty. Perhaps the time has come to alter our attitudes towards treatment.

R STANHOPE

Senior Lecturer in Paediatric Endocrinology

A ALBANESE

Research Fellow in Paediatric Endocrinology

S SHALET

Consultant Endocrinologist

Medical Unit,  
Institute of Child Health,  
London WC1N 1EH

- 1 Prader A. Delayed adolescence. *Clin Endocrinol Metab* 1975;4:143-55.
- 2 Eastman CJ, Lasarus L, Stuart MC, Casey JH. The effect of puberty on growth hormone secretion in boys with short stature and delayed adolescence. *Aust NZ J Med* 1971;1:154-9.
- 3 Nielson CT, Skakkebaek NE, Darling JAB, Hunter WM, Richardson DW, Jorgensen M, et al. Longitudinal study of testosterone and luteinizing hormone (LH) in relation to spermatogenesis, pubic hair, height and sitting height in normal boys. *Acta Endocrinol* 1986;279(suppl):98-106.
- 4 Crowne EC, Shalet SM, Wallace WHB, Eminson DM, Price DA. Final height in boys with untreated constitutional delay of growth and puberty. *Arch Dis Child* 1990;65:1109-12.
- 5 Crowne EC, Shalet SM, Wallace WHB, Eminson DM, Price DA. Final height in girls with untreated constitutional delay of growth and puberty. *Eur J Pediatr* 1991;150:708-12.
- 6 Skuse D. The psychological consequences of being small. *J Child Psychol Psychiatry* 1987;28:641-50.
- 7 Stanhope R, Brook CGD, Pringle PJ, Adams J, Jacobs HS. Induction of puberty by pulsatile gonadotrophin-releasing hormone. *Lancet* 1987;ii:552-5.
- 8 Uruena M, Paniotou S, Preece MA, Stanhope R. Is testosterone therapy for boys with constitutional delay of growth and puberty associated with impaired final height and suppression of the hypothalamic-pituitary-gonadal axis? *Eur J Pediatr* 1992;151:15-8.
- 9 Wilson DM, Kei J, Hintz RL, Rosenfeld RG. Effects of testosterone therapy for pubertal delay. *Am J Dis Child* 1988;142:96-9.
- 10 Jos EE, Schmidt HA, Zuppinger ZA. Oxandrolone in constitutional delayed growth, a longitudinal study up to final height. *J Clin Endocrinol Metab* 1989;69:1109-15.
- 11 Stanhope R, Brook CGD. Oxandrolone in low-dose for constitutional delay of growth and puberty in boys. *Arch Dis Child* 1985;60:379-81.
- 12 Finkelstein JS, Neer RM, Beverley MD, Biller MK, Crawford JD, Klibanski A. Osteopenia in men with a history of delayed puberty. *N Engl J Med* 1992;326:600-4.
- 13 Bonjour J-P, Theintz G, Buchs B, Slosman D, Rizzoli R. Critical years and stages of puberty for spinal and femoral bone mass accumulation during adolescence. *J Clin Endocrinol Metab* 1991;73:555-63.
- 14 Finkelstein JS, Klibanski A, Neer RM, Doppelt SH, Rosenthal DI, Segre GV, et al. Increases in bone density during treatment of men with idiopathic hypogonadotrophic hypogonadism. *J Clin Endocrinol Metab* 1989;69:776-83.