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## Editorial

### ENHANCING PHYSICAL PERFORMANCE: A POTENTIAL MEDICAL TIME BOMB

Over the last decade physical exercise sessions and sporting activities have been actively promoted through all strata of society not only as a way for maintaining health and avoiding disease, but also as an opportunity to acquire personal qualities and build character. The accompanying sense of well-being, the cultivation of a team spirit, the nurturing of altruistic care and the dissipation of stress and tedium are further commendable rewards for regular exercise. The dividing line between 'taking part' and 'competing' is, however, fine and participants in amateur sporting activities often find that taking part and 'working out' are not quite enough. There is the wish to excel and to be as good as and, if at all possible, better than their partners. The *multi-gym* has become a temple to be visited and worshipped in regularly and frequently. A hagiology of both male and female, successful, highly paid, professional sports personalities has been created by the media and advertising agencies, a panoply of role models for the young. The young executive on the way up the promotion ladder is expected to curb his stress and anxieties by 'pumping iron' on penitential racks, treadmills and static bicycles. The fashionable image for both genders is of a body bursting forth with well developed and tensed muscles—dying to be big.<sup>1</sup> Sport has also been advocated as a means of reducing the use of drugs by young adolescents, by removing boredom and inertia that may be partly to blame for the drug culture.

Personal and peer group pressures to do well in sport have induced many young sportsmen, professional or otherwise, to resort to performance enhancing drugs, the objectives being first to improve body image and increase muscle mass and secondly to increase performance and strength when these muscles are called into play.<sup>2</sup> Because these drugs also facilitate longer and harder training sessions they are often referred to as training drugs.<sup>3</sup>

The use of extraneous agents to improve sporting performance goes back into antiquity. The Berserkers of Norse mythology ate *Amanita muscaria*, a mushroom with psychoactive properties, to enhance their predatory prowess. Professional athletes of ancient Greece also used hallucinogenic mushrooms, and Galen in the third century writes of the use of stimulants by athletes; gladiators in the Circus Maximus used stimulants mixed with alcohol to overcome fatigue and the effects of injury.<sup>4</sup>

The performance-enhancing agents most used by youngsters today are not controlled stimulants such as amphetamines, but synthetic androgenic steroids. In 1992 in a survey in Scotland approximately 5 per cent of gymnasium users had experience of such steroids and a similar proportion of students in a technical college.<sup>5</sup> Korkia and Stimson found that 9 per cent of men and 2 per cent of women had used steroids and 6 per cent of men and 1.4 per cent of women were current users;<sup>6</sup> Perry *et al.* estimate that about 40 per cent of gymnasium attenders have used these drugs.<sup>1</sup> There is some evidence that coaches and supervisors of sporting establishments encourage youngsters to use these agents

and may surreptitiously provide them.<sup>7,8</sup> Those occupations where it is an asset to exhibit muscle bulk also make regular use of these drugs; these include soldiers, police officers, 'bouncers' and security men.

This experience is not limited to the UK; indeed in North America the problem is much larger and more pervading. Ryan, twenty-five years ago, wrote a monograph *Anabolic steroids are fools' gold*<sup>9</sup> and three years later Goldman wrote *Death in the locker room: steroids and sport*.<sup>10</sup> This problem has not gone away since and has reached epidemic proportions among American high school and college students with an estimated one million adolescents regularly taking drugs.<sup>11-13</sup> The trend in Europe is moving in the same direction.

Over one hundred preparations are on the market either in tablet form or for intramuscular injection including Boldenone, Mesterolone, Methandienone, Stanozolol and Nandrolone. Often, to enhance their effects and to avoid detection in competitive sport, the drugs are 'stacked' i.e. several different drugs are taken simultaneously; they may also be 'cycled', i.e. different anabolic drugs are alternated and taken in doses in excess of the therapeutically recommended amount, sometimes up to fifty times the standard dose.<sup>13,14</sup> Their effectiveness in enhancing muscular strength is still a matter of debate though the consensus is that in normal men doses leading to steroid levels well in excess of physiological do increase muscular strength.<sup>13,15,16</sup>

The side-effects of these drugs reflect the amounts taken, the variety and route of administration and the length of time over which they are used, but as a general rule it is not possible to predict individual patterns of reactions to them. Physical as well as behavioural effects have been reported;<sup>1,8</sup> their water retaining properties (which account for some of the increased muscular bulk) may lead to hypertension and renal problems. Lipid alterations may result in premature atherosclerosis and arterial occlusive problems. Liver damage with jaundice, the formation of *peliosis hepatis*, and hyperplastic and sometimes neoplastic nodules, both benign and malignant, are well documented. Men suffer from acne, reduced libido, testicular atrophy, impotence and gynaecomastia which although reversible may take several months to disappear after ceasing to use the drug. The hypogonadotropic azoospermia induced by androgenic steroids may be difficult to reverse.<sup>17-20</sup> Premature onset of prostatic adenocarcinoma has also been reported.<sup>21</sup> Females may experience masculinising effects with development of facial hair, alopecia and deepening of the voice; menstrual irregularities are common and during pregnancy these drugs may lead to miscarriages, fetal abnormalities and stillbirths. In peri-pubescent children growth is affected and stunting may result from premature epiphyseal closure.

Perhaps more insidious and potentially more sinister are the behavioural effects in some steroid-taking individuals. There may be mood swings with heightened aggression known colloquially as 'roid rage',<sup>22</sup> surfacing of bizarre personality<sup>23</sup> and psychiatric problems. The result may be violent crime, and even homicide. Many become addicted to these drugs.

In 1995 there were some moves in the UK to make the supplying of anabolic steroids illegal, but the well rehearsed argument for driving the practice further underground and into the shadier realms of the black market won the day. The emphasis so far has been on surveillance and education. Those young people who may be considering engaging in this practice should be provided with full and accurate information about steroid use and its risks. Hence there is a need for

education of parents and teachers. The health implications particularly in the long-term are difficult to assess and workers in primary medical care and community pediatrics need to keep steroid abuse well in their sights. Physical education teachers and other teachers at schools also have to be on the alert.

One of the consequences of the saturated coverage by television and newspapers of the performance of athletes in the Olympiad in Atlanta, USA, is an acute resurgence and recrudescence of interest in physical sport coupled with a nationalistic feeling of the need to acquire more medals for one's own country in four years time. This may add to the pressure on youngsters, especially those already engaged in sport, and imbue them with an added desire to excel. Then temptation may ignite the fuse of a medical time bomb.

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