

## Performance enhancing drugs in sport and children.

**Joe Brierley**

An initial document for discussion at the EAPS Ethics meeting

The recent Olympic controversies about both state-sponsored and individual use of illegal performance enhancing drugs reignited deliberation in this area. As Child health professionals we recognise that encouraging, and indeed demanding, the opportunity for children to participate in Sport is an essential part of physical, mental and psychosocial development. Sport should be for all children, yet we acknowledge that for many elite competitors the foundation of excellence is in childhood. (Reference to Liesbeth's document)

The pressures and drive to compete at high level must not compromise other crucial aspects of the child's overall rounded development into the adult. But to achieve excellence an environment that facilitates this whilst enabling elite training must be provided. However, peer and other social pressures around winning and physical appearance lead to a culture of normalisation of 'performance' and 'appearance' enhancing agents. (Yesalis C)

If elite competition/training to the persistent detriment of overall development or education occurs then child protection procedures become mandatory. (Savelescu J)

Many elite athletes, and indeed others, feel the need to optimise athletic performance by taking substances - whether by improving muscle function, overall muscular strength and mass, or more rapid recuperation from exercise. The use of such agents is widespread whenever surveys of suitable child-athlete groups are undertaken, yet little formal research is available to guide use. (Castillo E) Substances might be ingested as nutritional supplements or taken as medication by tablet or injection or occasionally by other methods. (Calfée R)

Non-athletic-related un-prescribed use in young people includes cosmetic attention to body habitus

The groups of agents and reasons for use are well described in the excellent American Academy of Pediatrics statement on this <http://pediatrics.aappublications.org/content/115/4/1103>, this enables us to focus on practical support for children, their parents and trainers and establish a European standard for practitioners.

### Commonly used agents include:

- **Creatine:** Sold as an over-the-counter supplement, this naturally occurring compound is used to improve performance during high-intensity activity and increases muscle mass & strength with widespread use in modern Rugby football/American football. Little long-term safety data exists –but creatine is possibly safe in adults if used at recommended doses by those without comorbidity. (U.S. Food and Drug Administration (FDA) physician consultation before creatine use)

BUT – no long-term safety data in children

- **Protein supplements:** Again over the counter. Proposed to increase lean muscle mass, strength and power & promote weight gain -but research suggests also need increased calorie and carbohydrate intake. Side effects: anecdotal reports of renal problems

- **Steroids:**

- (i) Anabolic steroids: Synthetic versions of testosterone used to build muscle and increase strength. Prescription only UK
- (ii) Steroid precursors: Converted in the body to anabolic steroids, also increase muscle mass. Prescription only UK

All freely (unlawfully) available via the internet. Mostly taken as injection directly into muscle, but some available in tablet form, creams or gels.

Whilst most investigations into anabolic steroids, and indeed all performance enhancing agents has focussed on young male athletes, use in female athletes is certainly an important consideration and side effects in both groups are considered below. (Matich A)

Side Effects in Teenage boys: Reduced sperm count & infertility; shrunken testicles and erectile dysfunction; breast development; severe acne

SE in Teenage girls: Facial and body hair growth or hair loss; loss of breasts; swelling of the clitoris; a deepened voice; an increased sex drive; problems with periods; severe acne

In both: Stunted growth; heart attack or stroke; liver/kidney tumours; hypertension; blood clots & psychological effects: aggressive behaviour; mood swings; mania; hallucinations & delusions

If injected and needles shared of course all the risk of transmittable infections

- **Ephedra:** Herbal name -ma huang, contains ephedrine. Sold as a fat burning sympathomimetic which acts on alpha and beta adrenergic receptors to allegedly burns fat, increase energy, decrease appetite whilst delaying workout fatigue, improve performance and concentration. Side effects are significant, and preclude safe use. (Desjardins M)
  - Not recommended in children by the FDA due to risk of toxicity and death!
- **Erythropoietin, human growth hormone, insulin like growth factor 1, insulin, diuretics, stimulants (ADHD agents), levothyroxine, and gamma-hydroxybutyrate and pain killers to enable more training through the pain barrier** have all been described as performance-enhancing agents for teenagers. (Albertson T)
  - None ought to be acceptable to child health professional, and if use is revealed it must lead to other actions such as dissuasion, counselling and ultimately child-protection

## **Role of child health professionals; A pragmatic approach**

Of the agents discussed use of creatine seems especially prevalent, (Wiens) though protein supplements also common in power-based sports. Therefore, working with children and their parents/family together with trainers to ensure use that is as safe as possible seems to be the most sensible approach. (Laos C) Young athletes need to understand the overall lack of safety data, and potential complications – especially given any co-morbidity that may increase this e.g. diabetes. Professional recommending ought to remain that children should not take creatine, but if they do remember it is not unlawful! Children ought to take the recommended amount for weight and have expert dietetic and paediatric advice.

It appears elite young athletes would like information provides by professionals in individual consultations, via club presentations and via accredited resources on the internet (Wiens) We recommend paediatric supervision of elite child-athletes to ensure safety, to optimise their physical, mental and emotional development into rounded adults who ideally can maintain high level physical activity throughout life.

## **References**

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## **BOX 1**

### **European Academy of Paediatrics Statements**

**Whilst different jurisdictions and sports deal with different agents in different manner we wish to highlight some general principles.**

- No child should be exposed to any medication or supplement which illegal
- No child should be exposed to any medication or supplement for which extensive safety data on toxicity and long-term effects is known
- Paediatricians should play no role in the use of anabolic steroids for athletic performance.
- Child protection thresholds may be reached either by elite competition/training to the detriment of overall development/education OR the use of banned substances
- Given the widespread use of creatine despite lack of long-term safety data paediatricians should counsel teenagers against use, however if use occurs it should ideally be supervised by a child health professional who must ensure no excessive dosing is used, and no co-morbidity exist
- Paediatric supervision of elite child-athletes into adulthood is recommended