

Medical and Ethical Concerns Regarding Women With Hyperandrogenism and Elite Sport

Peter Sonksen, Malcolm A. Ferguson-Smith, L. Dawn Bavington, Richard I. G. Holt, David A. Cowan, Don H. Catlin, Bruce Kidd, Georgiann Davis, Paul Davis, Lisa Edwards, and Anne Tamar-Mattis

Department of Endocrinology (P.S.), St Thomas' Hospital, King's College London, and Southampton University, Southampton SO32 1HP, United Kingdom; Department of Veterinary Medicine (M.A.F.-S.), University of Cambridge, Cambridge CB3 0ES, United Kingdom; School of Physical Education, Sport and Exercise Sciences (L.D.B.), University of Otago, Dunedin 9015, New Zealand; Human Development and Health Academic Unit (R.I.G.H.), Faculty of Medicine, University of Southampton, Southampton SO16 6YD, United Kingdom; Department of Pharmacy and Forensic Science (D.A.C.), King's College London, 2LS WC2R London, United Kingdom; Department of Molecular and Medical Pharmacology (D.H.C.), University of California, Los Angeles, Los Angeles, California 90095; Faculty of Kinesiology and Physical Education (B.K.), University of Toronto, Toronto, Ontario, Canada M5S 2W6; Department of Sociology (G.D.), University of Nevada, Las Vegas, Nevada 89154 and President of the AIS-DSD Support Group; Sport and Exercise Sciences (P.D.), University of Sunderland, Sunderland SR1 3SD, United Kingdom; Cardiff School of Sport (L.E.), Cardiff Metropolitan University, Cardiff CF5 2YB, United Kingdom; and Advocates for Informed Choice (A.T.-M.), Cotati, California 94931

In May 2011 and June 2012, respectively, the International Association of Athletics Federations (IAAF) (1) and the International Olympic Committee (IOC) (2) implemented new regulations governing the eligibility of female athletes with hyperandrogenism to compete in elite sport. The IAAF policy stipulates that a female athlete is eligible to compete in the women's category only if she has blood T levels below 10 nmol/L, the lower limit for men. Athletes found to have T levels above this lower limit, without an associated androgen insensitivity, are required to undergo medical intervention or risk being excluded from women's events. The move by the IAAF and IOC to use serum T as the sole biological variable to regulate eligibility in women's events has been met with controversy (3). Critics argue that this decision relies on the false assumption that T levels in blood determine athletic performance, which is not supported scientifically (4–7).

The IOC/IAAF policy is motivated by a misguided sense of “fairness.” The policymakers seem to believe that some natural qualities in women (like endogenous T) are so significantly associated with outstanding athletic perfor-

mance that, unlike other naturally occurring variations that may affect performance, they must be diagnosed by testing and reduced or eliminated by medical intervention to create fairness in athletic competition. Even if it can be shown that high levels of natural T predictably determine better athletic performance (which the research to date does not support), we do not accept that it would necessarily violate the ideals of sport. We must point out that for many years now, natural advantage among male athletes has not been policed and reduced in sports, but on the contrary has been admired and celebrated. These are important arguments; however, our primary concern here is with the medical and ethical issues these policies raise regarding the governance of elite sport.

This is evidenced in the article by Fénelon et al (8). Although of great interest, the reported medical decisions violate ethical standards of clinical practice. The authors present the results of a retrospective clinical study out of the Nice and Montpellier University Hospitals in France, which collaborate as specialist reference centers on behalf of sport's governing bodies to diagnose and treat athletes

ISSN Print 0021-972X ISSN Online 1945-7197
Printed in U.S.A.

Copyright © 2015 by the Endocrine Society

Received August 13, 2014. Accepted December 3, 2014.

First Published Online January 14, 2015;

Abbreviation: DSD, disorder of sex development; T, serum testosterone concentration.

For related article see page 828

who become subject to investigation under the new regulations. The stated aim of the study was to determine whether the detection of high T levels in elite young female athletes during hormonal screening programs would reveal an unsuspected XY disorder of sex development (DSD). Although of great interest, the reported medical decisions in this case violate ethical standards of clinical practice.

Certainly, it will be appreciated that this practice may have devastating effects on unsuspecting athletes (9). As in previous years, those who become subject to investigation express little doubt about their femininity and/or womanhood. The discovery and diagnosis of a DSD will likely come as a severe shock, and the potential for harm is not a trivial matter. It was this well-recognized harm that led the IAAF in 1991 and the IOC in 1999 to abandon their mandatory testing practices (10). The assumption that the high levels of endogenous T that have been found in elite female athletes with 46,XY DSD gives them an unfair advantage in competition is mistaken. This is shown by many such athletes who have nonfunctioning T or in whom T is absent due to previous gonadectomy (11). T cannot be the explanation of their success. Rather, evidence indicates that their success can be attributed to genes on the Y chromosome, particularly those controlling height and lean body mass (11).

The authors introduce a serious error by appealing to the claim that one of the purposes of the current regulations is to protect the health, private life, and integrity of athletes with 46,XY DSD hyperandrogenism. The unnecessary surgical and medical procedures in each case raise serious ethical concerns, given that they were deemed necessary for eligibility purposes. For despite receiving a diagnosis that their condition carried no health risk, each athlete underwent a partial clitoridectomy with a bilateral gonadectomy, followed by a deferred feminizing vaginoplasty and estrogen replacement therapy in order to continue competing in the women's category. Indeed, that all four athletes agreed to these procedures appears inconsistent with clinical practice whereby many women with 5 α -reductase deficiency choose to retain their gonads and decide against medical intervention. The additional feminizing procedures are particularly alarming. The removal of gonads and clitoral mutilation for the purposes of eligibility in the women's category is unethical. Furthermore, there are serious implications in both the short and long term in using hormonal screening programs—implemented for the purposes of antidoping—to identify and detect a previously undiagnosed DSD in young athletes with female phenotypes. The IAAF offers to pay for the gonadectomy and other medical procedures but not the aftercare, and the IOC bears no responsibility in this

regard. This situation is likely to have a potentially negative impact on athletes from regions that lack the appropriate resources and availability for long-term follow-up and/or where medical supervision and lifelong hormone replacement would be expensive.

The publication of the athletes' confidential medical results also contradicts existing protocols surrounding the procedures, despite changes in this area having been touted as significant improvements to the new policies. Ethical approval for this retrospective clinical study was not provided, and the decision to include detailed information relative to the participation of four young female athletes renders them additionally vulnerable and potentially identifiable in the context of elite women's competition. Given that their eligibility to compete was clearly dependent upon agreeing to the procedures, the line between consent and coercion is blurred in this instance. The reported medical decisions rendered violate ethical standards of clinical practice and constitute a biomedical violence against their persons.

Today, one of the “fundamental principles” of fairness in sport is nondiscrimination, namely that opportunities to participate and compete be open to all, regardless of economic, social, religious, racial/ethnic, and linguistic background or sexual orientation, as evidenced in Principle 6 of the Olympic Charter. We only ask that such a standard of fairness apply to all women; ie, a woman who has been living as a woman and has not been doping should be able to compete as a woman. We maintain that the regulations governing the eligibility of female athletes with hyperandrogenism should be rescinded and the unnecessary medical intervention and corrective treatment in otherwise healthy women should be discontinued immediately. Athleticism is determined by far more than either chromosomes or T concentration allow.

Eliminating the “hyperandrogenism” policy would have the double advantage of significantly reducing the probabilities of harm, given these policies that claim to be concerned with “fairness” have failed to achieve their stated aims.

Acknowledgments

Address all correspondence and requests for reprints to: Peter Sonksen, OBE, MD, FRCP, FFSEM(UK), East Wing Preshaw House, Southampton, Hampshire SO32 1HP, United Kingdom. E-mail: phsonksen@aol.com.

Disclosure Summary: The authors have nothing to disclose and no grants or funding were used.

References

1. **International Association of Athletics Federations.** IAAF Regulations Governing Eligibility of Females With Hyperandrogenism to Compete in Women's Competitions. www.iaaf.org/about-iaaf/documents/medical. Effective May 1, 2011. Updated December 11, 2012. Accessed December 17, 2014.
2. **International Olympic Committee.** IOC Regulations on Female Hyperandrogenism. www.olympic.org/Documents/Commissions_PDFfiles/Medical_commission/IOC-Regulations-on-Female-Hyperandrogenism.pdf. Accessed December 17, 2014.
3. **Karkazis K, Jordan-Young R, Davis G, Camporesi S.** Out of bounds? A critique of the new policies on hyperandrogenism in elite female athletes. *Am J Bioeth.* 2012;12(7):3–16.
4. **Healy ML, Gibney J, Pentecost C, Wheeler MJ, Sonksen PH.** Endocrine profiles in 693 elite athletes in the postcompetition setting. *Clin Endocrinol (Oxf).* 2014;81(2):294–305.
5. **Jordan-Young RM, Sonksen PH, Karkazis K.** Sex, health, and athletes. *BMJ.* 2014;348:g2926.
6. **Davis P, Edwards L.** The new IOC and IAAF policies on female eligibility: old emperor, new clothes? *Sport Ethics Philos.* 2014;8(1):44–56.
7. **Bermon S, Garnier PY, Hirschberg AL, et al.** Serum androgen levels in elite female athletes. *J Clin Endocrinol Metab.* 2014;99(11):4328–4335.
8. **Fénichel P, Paris F, Philibert P, et al.** Molecular diagnosis of 5 α -reductase deficiency in 4 elite young female athletes through hormonal screening for hyperandrogenism. *J Clin Endocrinol Metab.* 2013;98(6):E1055–E1059.
9. **Wiesemann C.** Is there a right not to know one's sex? The ethics of 'gender verification' in women's sports competition. *J Med Ethics.* 2011;37(4):216–220.
10. **Elsas LJ, Ljungqvist A, Ferguson-Smith MA, et al.** Gender verification of female athletes. *Genet Med.* 2000;2(4):249–254.
11. **Ferguson-Smith MA, Bavington LD.** Natural selection for genetic variants in sport: the role of Y chromosome genes in elite female athletes with 46,XY DSD. *Sports Med.* 2014;44(12):1629–1634.