

New study examines the validity of epo testing

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Recombinant human erythropoietin (rHuEpo) is a genetically engineered hormone sometimes misused by high-performance athletes such as cyclists and marathon runners to boost their endurance. The potential misuse of the drug is detected in urine collected from athletes. Since the test was introduced in 2000, 33 labs around the world have been accredited by the World Anti-Doping Agency (WADA) to administer the procedure.

During the last few years, the testing procedure has been criticized by some. Accordingly, a team of researchers investigated the quality of the test results at two WADA labs. They found that the detection power of the test at the two labs was poor.

The Study

The study is entitled, "Testing for Recombinant Human Erythropoietin in Urine: Problems Associated with Current Anti-Doping Testing," and was conducted by Carsten Lundby, Niels J. Achman-Andersen, Jonas J. Thomsen, Anne M. Norgaard and Paul Robach, all of the Copenhagen Muscle Research Center, Copenhagen, Denmark. The findings appear in the online edition of the Journal of Applied Physiology, published by the American Physiological Society.

The researchers conducted the study using eight male volunteers (nonathletes). Following baseline measurements, the volunteers were injected



every second day for 14 days with 5,000 IU rHuEpo (the "boosting period"). For the next two weeks, the volunteers received one injection every seven days (the "maintenance" period). Blood samples were drawn before the injections and on eight additional occasions. Urine samples were collected before the blood draws and on six additional days. Exercise tests using a bicycle ergometer were conducted prior to injection and on three other occasions.

Findings and Implications

The rHuEpo administration regimen was effective in increasing the oxygen carrying capacity of all the volunteer subjects, and at the same time, their performance increased. Additionally:

-- Using the samples collected during the boosting phase, Lab A concluded that all the samples were positive for rHuEpo. Lab B determined that none of the samples, despite being identical to Lab A's samples, were positive.

-- For samples collected during the maintenance period, Lab A determined that six of 16 samples were positive and two samples were suspicious. By contrast, Lab B found no positive samples.

-- For samples collected during the post-treatment phase, Lab A concluded that two of 24 samples were positive and three were suspicious. Lab B determined that all 24 samples were negative.

The implication– if applied to athletes – is that there is only a small "risk" of being tested positive for rHuEpo doping while athletic performance is greatly enhanced. If the samples are analyzed by Lab B, the risk of doping detection is non-existent. It should be noted that in this study, the "maintenance" period was only two weeks – but according to the authors, this can be sustained for an entire sporting season.



Results in Perspective

The results demonstrate that the detection power of the WADA test is poor and that agreement in analytical results from two WADAaccredited laboratories is very poor. Given these and other findings, the researchers conclude that improvements in the current rHuEpo test are necessary, or that alternative tests should be developed. This however, seems unlikely to occur before major events scheduled for 2008 like the Tour de France or the Olympic Games in Beijing.

Source: American Physiological Society

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