PROJECT REVIEW

"An immediate Implementation of a Realistic Strategy Against rhEPO Doping; Two Indirect Blood Parameters Used for Screening and a Direct Detection of rfEPO in Urine for Confirmation"

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After regular injections of rhEPO, there is a feedback effect depleting the endogenous production of rhEPO (figure 1, lane f, almost no endogenous EPO can be detected).

The detection of a "positive case" has been based on the ratio between the sum of the areas of all bands appearing in the P1 range of an rhEPO standard analysed in parallel and the sum of the areas of all bands.

The determination of criteria for a positive sample has not yet been appreciated. It is proposed that independent experts produce a report of evaluation on the already existing data obtained in the Laboratory of Paris. Some validation process has already been set up in this laboratory in order to produce a publication including the whole description of the method and the results analyses of samples from double blind rhEPO treatment protocols.

The aim of this project is to have three IOC accredited laboratories capable of measuring the haematocrit and reficulocyte count before major competitions and also capable of detecting the presence of rhEPO in urine. The analysis of blood parameters has to be done, because it is a test sensitive, cheep, fast and selective enough to screen a maximum of athletes in a very short time. The doubtful samples will be selected and will be confirmed with the urinary test. As mentioned, this latter test is for the time being the only way to determine the presence or absence of rhEPO in urine, It is efficient, but it is expensive and time consuming.

Some sport federation (UCI, ISU, FIS, UIPMB) have introduced unannounced blood testing in order to evaluate the haematocrit and/or haemoglobin level before competitions. These tests have been going on for a few years and they have proved to be feasible at the beginning of any race/competition around the world. The possibility of measuring at the same time, in the same conditions, the reticulocyte count as well as the haematocrit level would be a very simple way to screen most of the athletes taking part to sport's events. In these conditions, both parameters can be measured immediately. Will be considered as suspicious the blood samples

with a haematocrit level > 47 % or with a reticulocyte count> 2.4 **%.** In such a case a urinary sample will have to be taken under the same regulation as an antidoping control and will have to be sent for analysis to one of the three lOG accredited laboratory. In cycling, UCI regulations will be applied every time the haematocrit is above 50 % (47 % for women).

The urinary test is still under evaluation by the lOG experts, but it was performed during the Olympic Games in Sydney. Two major sport federation, the UCI and the IAAF have accepted to introduce this test specially for the cycling season 2001 and the Athletics World Championship in Edmonton, as a pilot scheme. Due to technical and financial reasons it is compulsory to combine it with blood tests as mentioned above to avoid too many analysis (in case of acceptance, the detailed protocol will have to be set up, but at this time, one can presume that it will be inspired by the experience acquired in cycling).

This project has the advantage of being feasible in a short time period, because most of the analytical and pre analytical procedures have been tested for more than four years and they have proved to be robust. Moreover, the analysis of the reticulocyte count is nowadays something realisable thanks to entirely automatic analysers. These apparatus have become smaller and they can easily be transported and installed at the beginning of a stage of a major cycling event or an athletics' competition.

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Results and Conclusions

Part 1

In conclusion, we strongly recommend to the federations to have the blood samples analysed during or prior to the competitions with their own equipment to avoid any inter-technological variations, and especially to have a control of the entire process from blood sampling to blood analysis. Therefore, the confidentiality and the return of the results are optimal. Concerning the medical follow-up, parameters stable over time and temperature should be preferred to unstable parameters such as the haematocrit. Indeed, most of the time, the blood samples are not analysed right after venipuncture and travel from the medical surgery to the laboratory. The use of a SpyT during the sending off of biological samples (blood, urine) should be strongly required in order to identify strange results which notably come from an interruption of the refrigeration procedure. Furthermore, the follow-up of temperature is compulsory when using a transportable refrigerator, because it is necessary to cool down the temperature, but above all to avoid freezing of the samples (especially blood samples).

Part 2

In conclusion, the ideal way of performing blood analysis prior to competitions is to have first excellent pre-analytical conditions and have the analysis done as soon as possible. Then it is strongly recommended to have a unique type of technology for the determination of the blood parameters. In such a case the haematological/biological follow up gets really interesting and reliable, but for that, the federations still have to perform sufficient blood collections over the year and combine the data collected during the competitions with those compulsory for the haematological/biological passport for example. Otherwise, the lack of data does not enable the federations to focus on the athletes potentially manipulating their blood formulae. With experience and new technologies, it is now realistic with all the necessary precautions, to introduce the OFF-model in order to reduce the number of athletes abusing of rhEPO and/or blood transfusions. The health of the athletes and sport will certainly be the winner of such a strategy as it was the case with the haematocrit limitation introduced in 1997.

Publications

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