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Antidoping testing at the European Youth Olympic Winter Festival (EYOWF/FOTE), 17-23 February 2013, Poiana Brasov, Bucharest, Romania

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Abstract

The 2013 European Youth Olympic Winter Festival (2013 EYOWF) was held from 17-22 February 2013 in Poiana Brasov, Romania. The Romanian Doping Control Laboratory was asked by the organizer to be responsible for the doping analyses during the Festival. The laboratory was requested to analyze 51 urine samples in fast turnaround (48 hours reporting). Eight urine samples were also analyzed for EPO.
This poster describes doping control organization: staff organization, collection of samples and transport, procedures of analyses, equipments and results.

Introduction

Romania hosted the 2013 European Youth Olympic Winter Festival (EYOWF), held from 17-22 February 2013 in Poiana Brasov. The Festival is a multisport competition destined to junior athletes, held annually. At the 2013 edition of the Festival participated athletes aged 14 to 18 years old from 45 European countries. The Festival included competitions of Alpine Skiing, Ski Jumping, Cross Country, Biathlon, Snowboard, Figure Skating, Short-Track and Ice Hockey. The laboratory was requested that the samples should be analyzed in fast turnaround and the results should be available within 48 hours.

Experimental

The laboratory was staffed by 12 persons: 5 analysts responsible for instrumental analysis by chromatography techniques, 3 analysts responsible for peptide hormone analysis, 3 laboratory assistants responsible for sample preparation and cleaning and 1 laboratory assistant for sample reception.
The Romanian National Anti-Doping Agency was designated with organizing and coordinating the doping control testing. The organizing work started in September 2012; 5 doping control stations were organized on the future competition sites.
The doping control officers received specific training for this event during 2012. The team for sample collection was composed of: general anti-doping manager, 5 doping control station managers, 9 doping control officers and 5 chaperones.
Every evening the samples were driving by NADO personnel from Poiana Brasov to Bucharest (171 km) and delivered the same evening to the laboratory. Two laboratory assistants came in the evening for the sample reception; except for these two persons, no extra shifts were needed to run the laboratory.
The initial testing procedures the equipment employed in our laboratory are described in Table 1. The sample preparation for the combined steroid and corticosteroid screening was started immediately after sample receipt. For the other screenings, the sample preparation was started the next morning at 07:00. Confirmation or re-analysis of the suspicious A-samples was achieved the next day. Each batch of samples was analyzed together with positive and negative control urine samples [1]. For screening 4, screening 4.6 and screening 9 initial testing procedures, the sample preparation was performed from same aliquot [2]; the ethereal phase obtained after the LLE extraction was divided 2/3 for screening 4 and 1/3 for screening 9; the instrumental analysis for screening 4.6 was performed on the sample prepared for screening 4. For the rest of the procedures the sample preparation was performed, for each analysis, from a different aliquot.

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Procedure	Equipment
Screening 1. Analysis of volatile stimulants by GC/MS/NPD	GC-MS/NPD Agilent 6890N/5975N
Screening 4. Analysis of anabolic agents (free and conjugated) by GC/MS	GC-MS Agilent 6890N/5975N GC-MS Agilent 7890A/5975C
Screening 4.6. Analysis of anabolic agents (low concentration) by GC/HRMS	GC-HRMS Thermo MAT 95 XP
Screening 5. Analysis of diuretics and other compounds by SPE extraction and LC/MS/MS	
Screening 7. Analysis of beta-blockers by LC/MS/MS	LC-MSMS Agilent 1200/6410 LC-MSMS Agilent 1200SL/6410-2K
Screening 9. Analysis of corticosteroids and other compounds by LLE extraction and LC/MS/MS	
Analysis of plasma expanders in urine by GC/MS	GC-MS Agilent 7890A/5975C
Analysis of hCG in urine by electrochemiluminescence	Immunoassay System, Roche Hitachi, Elecsys 2010
Analysis of human rEPO and analogues in urine.	Electrophoresis System, GE Healthcare, Multiphor II Semi-dry Blot, Amersham, TE77PWR SDS-PAGE System, Biometra, ECO-MINI Luminescent Image Analyzer, GE Healthcare, ImageQuant LAS4000

Table 1: Procedures and equipment used for the analysis

Results and Discussion

The laboratory received 51 urine samples (30 from males and 21 from females) during the 6 days of the Festival. Table 2 reflects the number of samples analyzed each day as well as the distribution of samples between sport disciplines. Most samples received in a day were 23 samples on day 3 and 17 samples on day 6.

SPORT	18/2/2013	19/2/2013	20/2/2013	22/2/2013	23/2/2013	TOTAL
ALPINE SKIING		2	2	1		**5**
BIATHLON		4		5		**9**
CROSS COUNTRY		4		2		**6**
FIGURE SKATING				2		**2**
ICE HOCKEY				4	4	**8**
SHORT TRACK	4	10				**14**
SKI JUMPING		1	1	1		**3**
SNOWBOARD		2		2		**4**
TOTAL	**4**	**23**	**3**	**17**	**4**	**51**

Table 2: Number of samples analyzed distributed between sports and dates

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All samples were collected In-Competition and analyzed for the Full menu screen. Out of the 51 samples, 8 samples were also analyzed for EPO. Except for the EPO analyses, the test results were communicated to the Romanian National Anti-Doping Agency and submitted in ADAMS within 48h from sample receipt. No adverse or atypical analytical findings were detected.
In accord with our NADO, the laboratory carried-out a study to compare pH and specific gravity (SG) values measured with strips at the collection site with the pH and specific gravity values measured in the laboratory.
The purpose of this comparison was to asses the accuracy of the strip pH and SG measurement at the collection site vs. values measured upon reception by the laboratory and the resulting bias.

Figure 1 shows the correlation between differences in pH values (difference = pH strip value less pH pH-meter value) and pH values while Figure 2 shows the correlation between differences in SG values (difference = SG strip value less SG densitometer value) and SG values [3].
Most of the samples, approx. 78%, showed pH values between 5.0 and 6.0. The pH values measured with the strips are constantly lower. With some exceptions, the differences were bellow ± 1.0 pH units. These exceptions removed, no particular correlation trend is to be observed.
The specific gravity values ranged from 1.003 to 1.029; 33% of the samples had values lower than 1.010; 10% of the samples had values higher than 1.025. The specific gravity values measured with the strips are constantly higher. For most of the samples, the differences were within ± 0.010 SG units. No particular correlation trend is to be observed.

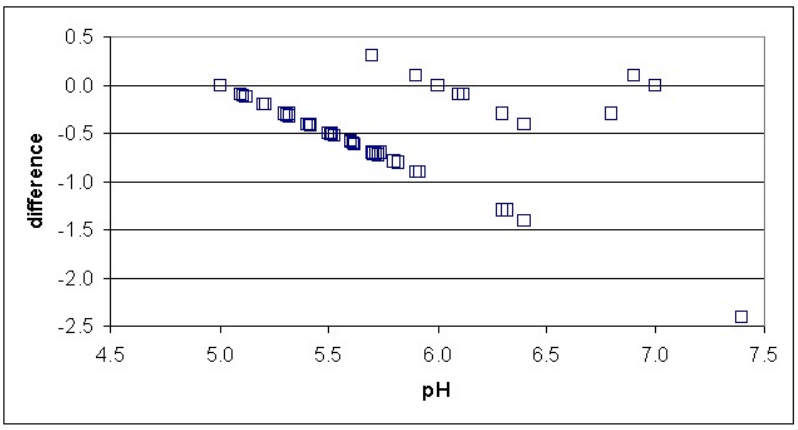

Figure 1: Correlation of (strip pH - pH-meter pH) difference versus strip pH value

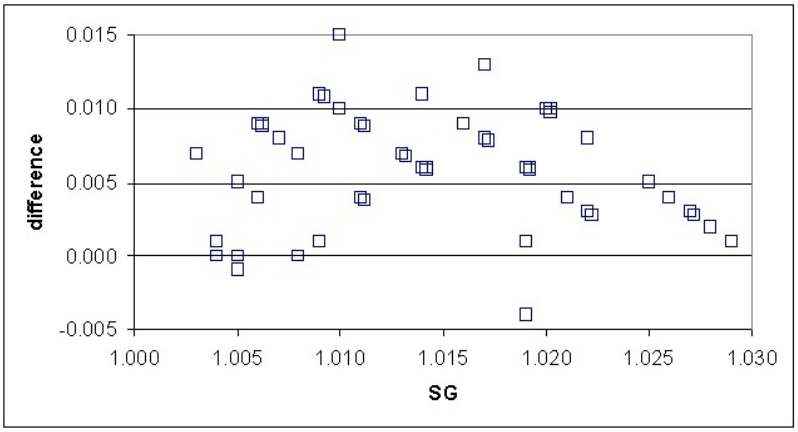

Figure 2: Correlation of (strip SG - densitometer SG) difference versus strip SG value

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Conclusions

During the 2013 European Youth Olympic Winter Festival, 51 urine samples were analyzed in 6 days from 8 different sport disciplines. The highest number of samples on one day was 23.
Out of the 51 samples, 8 samples were also analyzed for erythropoietin and analogues.
The results were reported within 48 hours after arrival of the samples in the laboratory.
No sample collected at the 2013 European Youth Olympic Winter Festival was found to be adverse or atypical.

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