PLENARY SESSION 3: Local Problems

Chairman: Mr. M. S. MOSS

RACING PROBLEMS IN THE U.S.A.

G. JAGGARD, B.Sc.

Dalare Associates, Inc, 2300 Locust Street, Philadelphia, PA 19103

ABSTRACT

The major problems of racing in the United States at the present time are caused by too much racing. This has led to too few horses and small fields. Consequently many owners and trainers are trying to enter their horses too frequently and to race them when they are not really fit to run.

The desire to race horses as frequently as possible has led to constant pressure from horsemen through their organizations for so called "permissive medication". Started in the state of Colorado approximately ten years ago this has grown until finally there are only a few states, notably New York and New Jersey that have resisted the pressure.

The drug that gave the opening wedge to permissive medication was phenylbutazone, but this in many states has led to the inclusion of other drugs including analgesics and drugs that veterinarians claim are needed for therapeutic purposes.

Some states have endeavoured to control phenylbutazone medication by quantitation and while lower limits cause little difficulty, maximum allowable limits have caused problems and are not practical.

While there has been no publicity to my knowledge about frusemide (furosemide, lasix) the abuse of this drug for so called "bleeders" is an example that may seriously interfere with drug detection in urine and its use should be confined to proven "bleeders" (i.e. horses suffering from epistaxis).

Pre-race blood testing began roughly ten years ago at the harness tracks and has been resisted by our flat tracks rather successfully up to the present time. The blood testing methods and those used by the same laboratories in post-race urine testing is inadequate and will not detect many illegal drugs.

Introduction

The major problems of racing in the United States at the present time are conceded by most interested persons to be caused by too much racing. This has led to too few horses, small fields, and increasing pressure of groups sometimes with interests, which are not always for the good of racing as a whole. Some of the results produced by these conditions, particularly relating to the use of drugs and their detection, are dealt with below.

Permissive Medication

The first introduction of permissive medication was about 10 years ago by the State of Colorado permitting primarily the use of phenylbutazone (Butazolidin) for therapeutic purposes. In 1962 the NASRC had after much controversy finally prohibited the use of phenylbutazone in the U.S.A. and Canada.

In May 1969 a revision of Colorado rules of May 2, 1966 issued information on allowable and prohibited drugs. Most important, however, was that phenyl-

butazone, oxyphenbutzone (tanderil) and indomethacin (indocid) also could be used up to approximately 24 hours before the race and when permitted would have to be used regularly until the horse was cured. This was controlled by the requirement that not more than 50 µg/ml of phenylbutazone and metabolites could be recovered from the urine sample.

The information that I received, however, was that not all horses on phenylbutazone and analgesics were "controlled", perhaps winners were. This is not "controlled medication" as I see it. The 50 µg/ml limit was also unworkable as was proved in California.

California

"Medication Procedures" effective December 26, 1970 in California states that "with very few exceptions all restorative, curative and therapeutic medications are permitted and may be administered up to midnight of the calendar day previous to the race."

Permitted medication included phenylbutazone, dextropropoxyphene (distalgesic, darvon), pentazocine

(fortral, talwin) and indomethacin. Phenylbutazone was not permitted the day of the race and this was to be controlled by quantitative urine analysis with a limit of 50 µg/ml. This limit was subsequently raised to 150 µg/ml plus or minus 10%.

**Not known in human medicine in Britain under these names – Ed.*

Ohio

I do not know the history of Permissive Medication in Ohio where pre-race blood testing has been used in harness racing for over ten years but in 1976 there are 16 drugs or drug classifications that are permitted.

Reports of "Controlled Medication" within 48 hours must be filed but the drugs can be administered up to 4 hours prior to post time. I noted no procedure for control testing or limitations on drug content.

We would not feel capable of properly testing post race urine from a horse that was administered dipyrone, one of the permitted drugs, administered 4 hours before the race. Dipyrone* "masks" for probably 48 hours in our procedure of testing.

So much for so called permissive or "Controlled Medication" which is not very well controlled in the U.S.A. in my opinion and which has broken down the barrier of not racing horses on drugs with an ever increasing list of medications.

Bleeders and Frusemide (Lasix)

A few years ago a prominent veterinarian recommended frusemide (lasix) to trainers as a treatment for "bleeders". Lasix is a powerful diuretic, used for treating high blood pressure and oedema in human medicine.

Since frusemide is best extracted only at around pH 2.0 to 4.0 it was not detected in routine post-race urine tests. Under these conditions the drug became very popular because some trainers felt that it benefitted the running of horses by removing some of the body fluids, particularly in regards to improving the respiratory function.

When we first tested the administration of frusemide in 1970 given simultaneously with several stimulants such as methylphenidate and amphetamines we found we could still detect the drugs if a small dose of frusemide was administered and if the first urine was collected for testing purposes.

Frusemide has been used quite frequently for obtaining urine from horses failing to urinate in the allowable time period in the U.S.A.; this use is justifiable. Frusemide became an ideal example of the abuse of a

good drug. From less than 5% "bleeders" at our tracks they started to include "potential bleeders" and we have encountered 30% to 75% of samples from some tracks containing this drug.

We realized that it was being used in doses and at times that would prevent the detection of illegal drugs if present. We conducted drugging experiments in 1973 showing that frusemide could be used to prevent the detection of phenylbutazone for up to approximately 5 hours if administered simultaneously, or completely if phenylbutazone was administered 18 hours before and Lasix given shortly before the horses went to post.

Obviously, frusemide can be administered so as to cause excessive urination before the official urine sample is taken and as a result there is no drug detectable in the official urine sample. We have tried to inform our officials and commissioners of these facts but have made too little progress.

Frusemide is specifically permitted in Ohio, Maryland and other states due to pressure from horsemen, and its use is tolerated in most other states. We are just beginning to make progress in its removal from the Permissive Medication List. Exceptions are New York State and the National Steeple-chase and Hunt Association which have never permitted the use of frusemide and New Jersey and American Horse Shows who are considering its exclusion.

A series of experiments designed to show the effect of frusemide on the excretion of phenylbutazone were carried out as follows.

Mares were given 2 or 4 grams of phenylbutazone by itself and 2 or 4 grams of phenylbutazone plus 5 ml of frusemide simultaneously and the recoveries of phenylbutazone and frusemide compared in urine and blood. Samples of urine were taken by catheter usually at ½, 1, 2, 5, 8, 24 and 32 hours when the diuretic was used. Samples of blood were taken at 1, 2, 5, 8 and 24 hours.

In brief the results of the use of frusemide simultaneously with phenylbutazone on post race urine is:

- 1) If you accept our standard that 5.0 mg or greater recovery from 200 ml of urine is a "positive" phenylbutazone then urine samples would usually be negative in ½, 1 and 2 hours and positive in 5 and 8 hours.
- 2) If phenylbutazone is administered 18 hours before the race and 5 ml of frusemide given just before post no phenylbutazone was found in blood or urine for a 48 hour period.

I think it is fair to conclude that frusemide can be

used effectively to prevent detection of other illegal drugs used in smaller dosage than phenylbutazone.

Brief History of Pre-Race Testing of Horses in the United States

There have been an almost continuous series of attempts to devise a method of pre-race testing of horses since saliva and urine testing was begun in the United States in 1937.

The methods that gained some recognition were as follows:

Pre-Race Testing in 1940s – Mouse Testing

This test was adopted to the best of my recollection by some half a dozen states but was shortly discontinued except in Maryland, where it persisted for a few years but was eventually discarded in favour of a more sophisticated testing in the original trailer designed for mouse testing.

The test consisted of the injection of 1 ml of saliva or urine from each horse into the intraperitoneal cavity of a mouse. The mouse's behaviour after injection indicated a "positive" or "negative".

The test was derived by Dr. Muench of Temple University and apparently had the approval of some individuals in the U.S. Narcotic Bureau. We demonstrated the Mouse Test to our New Jersey and Delaware Racing Commissions, commented unfavourably and the "Mouse Test" was never used in these jurisdictions.

Pre-Race Testing in the 1960s

1) Pre-race blood testing at Roosevelt Raceway in New York has been performed. Winston and Manning conducted experiments at the Roosevelt Raceway for several years which were reported in the literature at which time to the best of our knowledge the project was abandoned. The method used was gas chromatography of a blood extract and no outstanding results or recommendations were made to the best of my knowledge that the pre-race blood test could be used for official testing.

2) Pre-race testing Maryland. There have been numerous references to pre-race testing conducted by Herculson, and in more recent years Lomangino. These methods were merely variations of AORC procedures, such as UV absorption and the Maryland chemists we are sure would not recommend them as a satisfactory substitute for the post-race urine test.

3) In 1971 I was told a \$500,000 grant was made to Cornell University to conduct a pre-race blood test and to discontinue post-race urine testing by the New York

State AORC Laboratory. Cornell was also to conduct the post-race urine tests.

On my visit to New York in 1971 the pre-race test was conducted on a total of 10 ml of blood, 2 ml of plasma being used for the primary drugs, and the remainder for the phenylbutazone type. Much to our amazement the post-race urine test was performed on 2 ml of urine in contrast to 200 ml, which we use.

4) The Ohio State University received a grant of reputedly \$500,000 and have tried over a period of 10 years to use the best chemical methods on the testing of pre-race blood – reputedly continuing a post-race urine test.

This latest report from Ohio that I know of now claims that the pre-race blood test can now detect 26 drugs rather than 12 or 15 previously claimed, however not all 26 drugs can be covered in a single day.

There are 4 methods of drug coverage and there is only time enough for one method on any single day, so that drug detection or coverage must average 6 or 7 drugs only in any one day.

We were advised that one ml of plasma is used for the primary drug-testing and 10 ml of post race urine for the post race urine test.

To the best of my knowledge the pre-race blood testing has been confined to harness racing in the United States but a great deal of pressure is being used to include flat or thoroughbred racing. I would summarize my objections to the use of pre-race blood testing as an official procedure as outlined below.

Criticism of the Pre-Race Blood Test

1) The blood sample is too small. Some pre-race blood test laboratories use 1 ml of plasma, some perhaps 2 ml for the primary drugs. A horse contains about 38 litres of blood and even if all of the drug were present in the blood, many powerful drugs might be undetected by the screening methods used.

2) Many drugs leave the blood stream rapidly and very little remains in the blood 2 or 3 hours after administration. Drugs are usually detected in the urine up to 12 hours, sometimes 72 hours and longer in the case of phenylbutazone, procaine from procaine penicillin, dipyrone and others.

3) Too little time is available for applying 3, 4 or 5 screening tests which is desirable.

Chemists have agreed for years that no one test is "specific" for drug detection or identification.

We question if there is sufficient time for conducting hydrolysis procedures such as may be needed for apomorphine and other drugs in urine and for a separate extraction at low pH as is desirable for drugs such as Lasix and Motrin.*

4) The full value of gas chromatography cannot be utilized in the time available, because of the limit imposed by time and selection of conditions.

5) Urine samples generally contain much higher concentrations of drug, perhaps a thousand times more, than do blood samples.

6) Our 48 hour testing period permits full utilization of the urine sample, time for 3 to 5 screening or identification tests if needed, and the use of gas chromatography,

mass spectrometry if desired.

7) I also regard the Post Race urine testing as conducted by the Pre-Race Laboratories that I know of, as inadequate and no substitute for a proper Post Race Urine Test because they use an inadequate sample such as 2 ml to 30 ml and because they screen with only 1 or 2 test procedures.

These pressures and trends brought on by too much racing will, I fear, eventually destroy the good that has been accomplished in the last 30 odd years on preventing the drugging of horses.

Data on drug recovery from administration experiments to horses of four new analgesics is available from the author on request.

DISCUSSION

HAYWOOD: We sometimes encounter positive polyethylene glycol tests and whilst we do not encounter other substances, it is presumed that the glycol is used as a vehicle. We have a security system whereby an inspector will do a follow up at the stable and as a result of these enquiries they often come up with things like vitamin K, vitamin B₁₂ and other medicaments said to be useful in this context. Do you find this in the United States or does the permitted use of Lasix prevent use of these vitamins?

JAGGARD: Vitamins used to be used but do not show up on our procedure.

SMITH: Do you imply that the use of Lasix covers up another drug by speeding its rate of clearance?

JAGGARD: Lasix is a powerful diuretic and a horse may urinate 3 to 4 times on the racetrack before you get the official sample. Whatever drug is in the urine is expelled and lost.

BLAKE: I should like to make the point that at the University of Kentucky we are using the same techniques in our laboratory as is being used by the pre-race testing laboratories. We are finding 1 drug every 145 samples and 1 permitted drug every 1.66 samples and I think these techniques are very valid even under pre-race testing.

CHAIRMAN: I would attempt to crystallise what appears to be a difference here in two opinions. Would Blake accept the facts of what Jaggard has said that pre-race tests cover, say two dozen drugs but that the procedure used varies from time to time and each procedure in itself will not cover this number of drugs?

BLAKE: To a limited extent, it depends on the time available. One state has only 30 minutes, two others have 1.5 hours.

MAYNARD: We did a fairly complete feasibility study in Canada in 1971/72 and advised that the coverage of drugs at that time was completely inadequate for the costs involved. However techniques have improved and the Department of Agriculture has asked us to do another study. Three chemists plus myself will visit the pre-race laboratories in Ohio and New York to study in detail exactly what they are doing, and the degree of coverage they achieve. We will then do a laboratory study of sensitivities with the newer techniques such as GC using a nitrogen detector, and the feasibility of confirmation of any drug detected by GC/MS. This report will be handed to the Canadian Government and will be made available sometime in January 1977.

CLARKE: If you gave a large injection of thiamine would it interfere with the subsequent analysis?

JAGGARD: It does in our procedure because we use UV absorption as our first screen. You can feed as much as you want orally and it does not effect the procedure but if you inject, for instance, 1 gram of thiamine then you get some conjugate and UV obstruction which would prevent that particular screening test from being of any value in detecting a drug.