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volume 2

G. Siest, editor

DRUG EFFECTS ON LABORATORY TEST RESULTS

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Proceedings of a Workshop on 'The Use of Laboratory Test Results. Variations due to Drug Intake' sponsored by the Commission of the European Communities, as advised by the Committee on Medical and Public Health Research and held at the Abbaye des Prémontrés, Pont-à-Mousson (France), December 17-19, 1979

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PREFACE

This book constitutes the Proceedings of a Workshop held at Pont-à-Mousson under the aegis of the Committee of Medical Research and Public Health (CRM) of the Commission of European Communities.

After some introductory presentations, the different papers on drug effects concern four main themes:

- *analytical interferences*
- *drug effect on specific laboratory tests*
- *physiological or toxical effects*
- *general pharmacological effects*

Drugs and xenobiotics can increase or decrease the level of certain blood constituents. This effect may be desirable or not. It can be due to an analytical or to a pharmacological effect. It is necessary after such workshop to prepare detailed technical protocols for the two types of effects on laboratory tests.

The "in vitro" effects, called analytical interferences, have to be systematically checked, especially for chemical tests. There are likely to disappear with further progress in analytical methods towards specificity.

The "in vivo" pharmacological effects of drugs must be measured and calculated for every new drug or new laboratory method. The knowledge of these effects in terms of percentages will permit a better interpretation of laboratory results by physicians and clinical biochemists.

A consensus was established between the different participants of the workshop to emphasize the necessity of having a data bank on drug interferences and drug effects in clinical chemistry. This bank should also enclose information concerning the influence of other biological variation factors. Contrarily to the existing data banks, the new one should be filled up with validated information from the literature. It would be open for general practitioners, clinical chemists, pathologists, pharmaceutical industries... to better interpret laboratory results and diminish the incorrect diagnoses and mistreatment of patients.

We thank all those individuals who contributed to the efficiency and success of the meeting, as chairmen or secretaries of the scientific sessions. We wish also to thank Chantal Thirion for the general secretariat organisation of the meeting and the proceedings.

Gérard SIEST

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DRUG EFFECTS ON LABORATORY TESTS

PHYSIOLOGIC OR TOXIC EFFECTS

BASIC PROBLEMS

INTRODUCTORY CONSIDERATIONS ON DRUG EFFECTS IN CLINICAL BIOCHEMISTRY

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ABSTRACT

Drugs and xenobiotics can increase or decrease the level of certain blood constituents. This effect may be desirable or not. It can be due to an analytical or to a pharmacological effect.

The "in vitro" effect, called analytical interference, has to be systematically checked, especially for chemical tests. It is likely to disappear with further progress in analytical methods towards specificity.

The "in vivo" pharmacological effects of drugs must be measured and calculated for every new drug or new laboratory method. The knowledge of these effects in terms of percentages will permit a better interpretation of laboratory results by clinical chemists and physicians.

Laboratory tests can be used, in addition, to monitor drug effects. The authors rapidly describe the usefulness of laboratory tests in this field. The general introduction clearly shows that it is now necessary to prepare technical protocols for analytical interferences and pharmacological effects. It is obvious that international recommendations must be writen in order to collect information. All this work will be grouped in the next future into a data bank on drug effects. Clinical chemists, physicians... will improve the interpretation of laboratory test results in treated people by consulting this bank.

INTRODUCTION

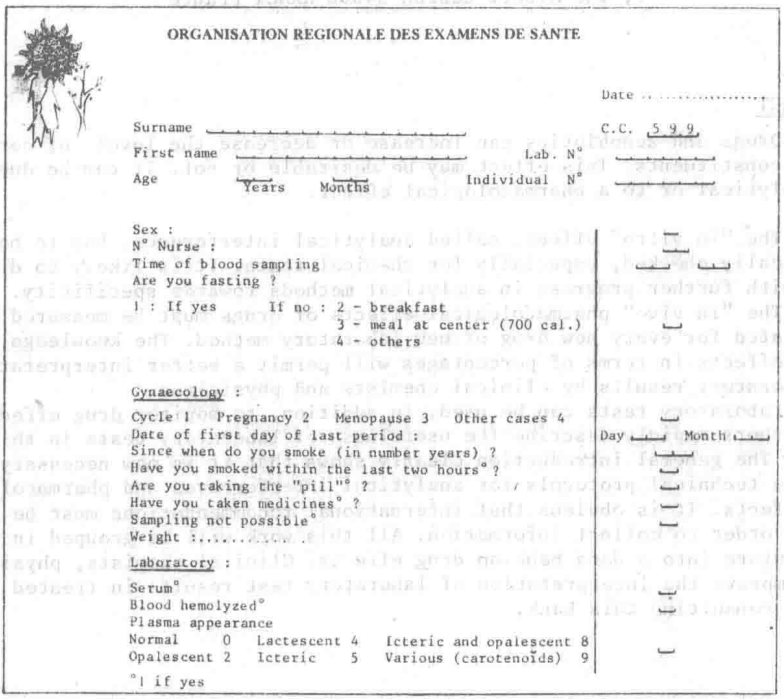
Clinical chemists, clinicians and drug manufacturers are increasingly aware of the problems related to the effects of drugs on laboratory tests (Siest et al., 1980). These effects can assume several aspects :

- a purely analytical aspect, in which the drug and/or its metabolites can perturb the assay of a constituent at any stage ; in clinical chemistry, the term "interference" can be reserved for this "in vitro" effect ;

- a biological aspect, in which the drug provokes a change in a biological parameter by a physiological, pharmacological or toxicological mechanism. This second aspect constitutes what can be called the unexpected secondary effects of drug, desirable or not.

Laboratory tests exploring the liver, the kidney, etc, may be carried

out for a person who, without the knowledge of the physician ordering the tests, takes tranquillizers, hypnotics, or oral contraceptives... So it is very important to know exactly the sort of drug taken by a patient and the exact conditions of administration. It is hopeful to get a precise questionnaire which can be filled at the same time the blood is drawn. The figure 1 presents an example of sampling form.



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Date .....

Surname ..... C.C. 5 9 9

First name ..... Lab. N° .....

Age ... Years ... Months Individual N° .....

Sex :
N° Nurse :
Time of blood sampling
Are you fasting ?
1 : If yes If no : 2 - breakfast
3 - meal at center (700 cal.)
4 - others

Gynaecology :

Cycle 1 Pregnancy 2 Menopause 3 Other cases 4
Date of first day of last period : Day ... Month ...
Since when do you smoke (in number years) ?
Have you smoked within the last two hours° ?
Are you taking the "pill"° ?
Have you taken medicines° ?
Sampling not possible°
Weight :.....

Laboratory :

Serum°
Blood hemolyzed°
Plasma appearance
Normal 0 Lactescent 4 Icteric and opalescent 8
Opalescent 2 Icteric 5 Various (carotenoïds) 9

°1 if yes

Fig. 1 : Sampling sheet

The drug intake questionnaire (Fig. 2) is used only if the patient has answered "yes" to one of the questions about drugs on the sample sheet.

Laboratory tests are also playing an increasingly important part in the monitoring of drug treatments. So far such tests have mainly been used only to evaluate the efficiency of treatments (with hypoglycemic agents, hypolipemic agents, anticoagulants, etc.). More recently, biological tests for such substances as triacylglycerols (triglycerides) have been more and more commonly used in the surveillance of patient taking oral contraceptives. Now a new chapter is beginning i.e. laboratory tests are used as indices of the activity of drug-metabolizing enzymes, particularly for their

ORGANISATION REGIONALE DES EXAMENS DE SANTE

Date .....

C.C. 6 1 1

Surname .....

First name .....

Lab. N° .....

Individual N° .....

I - Are you taking medecines as part of a long-term treatment 1:YES 2:NO —

If yes, which ?

Names	Names

II - Have you taken medicines in exceptional circumstances (during the last 48 hours) 1:YES 2:NO —

If yes, which ?

Names	Names

III - Have you undergone a long-term treatment (more than 3 months) which you have since stopped ?

1 - less than 1 month
2 - 1 week to 1 month —
3 - 1 to 6 months
4 - more than 6 months

IV - Have you already taken the "pill" ?

1:YES 2:NO —

If no, you are not concerned by the following

V - You take contraceptive pills:

. Since when ? Year ... Month ...

. Which pill are you using now ?

01 Anovlar	10 Ovariostat	24 Trentovlane
02 Gynophase	11 Ovulene 50	31 Norquentiel
03 Gynostat	12 Ov 28	32 Ovanon
04 Gynovlane	13 Planor	33 Physiostat
05 Lyndiol	14 Relovis	41 Exluton
06 Metrulene	15 Stediril	42 Microval
07 Millianovlar	21 Adepal	43 Milligynon
08 Noracycline	22 Minidril	
09 Nov 50	23 Minipnase	

. Have you changed the kind of pill ? 1:YES 2:NO —

- Old pill : ...
  Length of time taken (in months) : ...
- New pill : ...
  Length of time taken (in months) : ...

VI - Have you stopped taking the pill ? 1:YES 2:NO —

If yes, since when (in months) : ...

Name of pill which you took : ...

Fig. 2 : Questionnaire on the intake of drugs