

Clinical Need for Analyses Nearer the Patient

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In my county, Kristianstad in southern Sweden, we have had regular contacts between the laboratory and primary care doctors since the 1960's. We have registered which laboratory investigations are performed locally or sent on to the central hospital laboratory (1). Even more important are our regular meetings and discussions with clinicians on choosing meaningful clinical chemical and hematological investigations in different clinical situations.

The doctors in primary health care have expressed three main wishes: They wanted

- 1) Instrument service for photometer, centrifuge and microscope. This service was badly needed. Some microscopes constantly showed the "same" urine sediment picture
- 2) Regular quality control for the local analyses, especially blood hemoglobin. Documented good quality was preferred to quick but sometimes unreliable results.
- 3) Information to the doctors about test strategies and education of the personnel performing the laboratory tests.

The recommendations concerning choice of relevant laboratory tests for detection and follow up of different diseases have also been discussed thoroughly during 19 five-days postgraduate courses at the Department of clinical chemistry, Central Hospital, Kristianstad. The suggestions have also been open for discussion in the Swedish Society for Clinical Chemistry. A continuous reevaluation is made. The present recommendations are summarized in the textbook *Klinisk kemi*, edited by Laurell et al (2).

During these postgraduate courses "Clinical chemistry in primary care" we have summarized the role of clinical chemistry especially as regards analyses closer to the patient (see Table I):

Table I Clinical chemistry in primary health care

1. Selection of analyses
 - a) Prevalence of disease
 - b) Sensitivity and specificity of the method
 - c) Reference and decision limits
 - d) Effect of therapy
2. Selection of analytical technique
3. Information and (re)education
4. Quality assessment
5. Instrument care
6. Presentation and evaluation of results
7. Responsibility according to law
8. Economical responsibility

A meaningful use of laboratory tests depends primarily on the prevalence of the suspected disease. Doctors must be aware of the fact that the prevalence of diseases in primary health care is relatively low as compared to the situation in specialised university wards, where the doctors were once educated. When the prevalence is low the correct decision might even be not to perform a test. This is still true when new techniques for analyses are introduced and available closer to the patient.

The clinical value of an analysis is also dependent on the sensitivity and specificity of the method used. Consequently, the clinical chemist must inform all users about these things as well as about the actual reference limits. Decision limits do not necessarily coincide with reference limits and should of course be related to each specific disease.

Some analyses are specially suited for follow-up of disease and control of the effect of therapy. As drugs are widely used we must also inform the users that drugs can alter laboratory test results not only because they have therapeutic effects. Drugs can also interfere with the analytical determination and they can have a great variety of biological effects. Literature references are collected and continuously evaluated. The information is available via public telecommunication from a central computer or from the book "Drug interference and effects in clinical chemistry " (3).

After discussions with doctors in primary care we have published a detailed list of which analyses to recommend in the most common clinical situations (2). With respect to the techniques available today we have suggested which analyses can be performed locally and which should be sent to the hospital laboratory. We always start the discussion with an evaluation of the clinical need for laboratory investigations. The decision whether the analysis is best

performed locally or at a central laboratory is still open to discussion. New technology must be evaluated locally. The performance is often highly dependent on the education and training of the local personnel. Regular quality assessment is necessary. The quality and economy of the analyses thus depend upon many factors: Training of laboratory personnel, number of analyses per day, communications etc.

Almost all primary health care centrals perform blood hemoglobin (B-Hb) determination for which we have a well-organized quality-control-system in Sweden (1). The second most common laboratory investigation, erythrocyte sedimentation rate, (B-ESR), has a long tradition. Patients do not feel they are thoroughly investigated unless B-ESR is performed. The new vacuum technique for ESR determination has several advantages but still takes 60 minutes to perform and there is no quality control. The clinical need for urine testing has been critically evaluated in Sweden (4). Routine investigation now only includes glucose and albumin determination. Other tests are performed only on suspicion of special diseases. In the published table (2) with recommendation of tests the most common diseases in primary care are included.

More tests can be made in primary health care if well-trained laboratory personnel perform the local routine work. However, quality assessment from the central laboratory is still necessary.

We have recently asked primary care doctors which laboratory tests they would like to have performed locally according to the clinical need. As seen from Table II the need for clinical chemistry analyses closer to the patient includes serum potassium and serum creatinine in addition to the tests already performed. In our county the distance to hospital laboratories is short. In other parts of Sweden where the distance is longer other tests might be added e.g. enzyme analyses for liver or heart diseases.

The new instruments are especially well suited for toxicological analyses and control of drug administration. The need for this type of analyses was discussed and summarized at a joint meeting between the Swedish Society for Clinical Chemistry and the Central for toxicological information, Stockholm (5).

In conclusion, continuous discussions with clinicians on choosing meaningful clinical chemical investigations in different clinical situations are necessary. We present here several examples of clinical needs for analyses nearer to the patient.

The clinical chemist must take the responsibility for the evaluation of the effects of the new techniques.

Table II Need for local analyses in primary health care

(Opinion of doctors in Kristianstad county and
doctors in a postgraduate course)

B-Hemoglobin

B-Erythrocyte sedimentation rate

U-Albumin,-glucose,-hemoglobin

B-Glucose

U-Sediment

U-Human Chorionic gonadotropin

B-Leucocytes

B-Cells, microscopy

B-Coagulation factors

S-Potassium

S-C-reactive protein

S-Creatinine

U-Density

F-Hemoglobin

B-Thrombocytes

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