A review of biochemistry results

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The South-east London General Practitioners' Centre, by courtesy of the Southwark Borough Health Department, is a diagnostic and treatment centre for the use of general practitioners. It currently serves 300 family doctors and about 1,200 of their patients are sent to the centre each month.

We believe that those practitioners who use our centre regularly make use of it for most of the patients they are investigating. Practitioners have freedom to refer to other diagnostic services but access to some of these is more limited.

On average, each of these patients receive six-and-a-half items of service. They include x-rays, ECGs, nursing treatments and pathological investigations. About one third are served by the pathology department and are reported here.

Usually the patients present with a form of request from the doctor for a blood test, either haematology, biochemistry, or both, and since we have had access to a SMA 12 unit it has been possible to obtain a biochemistry profile on extra blood taken from these patients. With the help of the practitioners, by personal contact and questionnaires, it has been possible to make an organised guess at the help this kind of observation has been to them and what is felt to be clinically useful and economically possible.

TABLE 1
PROFILE UNDERTAKEN

Calcium
Inorganic phosphate
Glucose
Blood urea nitrogen
Uric acid
Cholesterol
Total proteins
Albumin
Total bilirubin
Alkaline phosphatase
Lactic dehydrogenase
Serum glutamic oxaloacetic transaminase

Figures are shown in percentages and the results have been classified into four groups:

1. Those in which all the items were normal;
2. Of those abnormal, the ones which the doctor suspected of being abnormal;
3. Those abnormal results which were not expected;
4. Those which appeared to be diagnostic;

TABLE 2
RESULTS

	Per cent
1. All items normal	*39*
2. Abnormal suspected by doctor	*26*
3. Abnormal not expected	*31*
4. Diagnostic	*4*

In each test an abnormal result was recorded only when it was two units outside the normal range, with the exception of glucose, where the range 50–120 mgm per 100 ml was taken as normal, and the upper level of the lactate dehydrogenase was taken as 300 mU/ml. The total abnormalities are shown in Table 3.

TABLE 3
TOTAL ABNORMALS

	Per cent
1. Lactic dehydrogenase	*24*
2. Serum glutamic oxaloacetic transaminase	*12*
3. Cholesterol	*11*
4. Uric acid	*11*
5. Glucose	*10*
6. Total bilirubin	*9*
7. Blood urea nitrogen	*8*
8. Alkaline phosphatase	*8*
9. Albumin	*5*
10. Inorganic phosphate	*4*
11. Total protein	*1*
12. Calcium	*1*

As stated they appear in order of frequency and it would seem to indicate that at least the first nine should be included in any routine survey. The number of patients having one or more abnormalities is notable.

TABLE 4

Number of specimens tested	*Number of abnormal results out of 12*
Per cent	
40	0
36	1
11	2
6	3
4	4
2	5
1	6

Discussion

The total number of abnormal results is 57 per cent, and by all standards this is a very high yield. Carmalt *et al.* (1970), in Birmingham showed 39 per cent abnormal (16·9 per cent new diagnoses), Scott and Robertson (1968) in Edinburgh showed 19 per cent abnormal cholesterols. Taylor (1970) found 2·2 per cent abnormal blood sugars and 4·6 per cent abnormal blood urea nitrogens. Probably the largest survey is being undertaken by Pincherle and Wright in London, where they are finding about 30 per cent abnormals in a much wider group of tests.

Our high figures are easily explained on the grounds that the patients screened were selected by general practitioners and of course the patients had elected to attend the doctor. This forms, therefore, a very different group from those taken in other screening surveys. Doctors who know something about the patients have some clinical reason for referral.

The fact that 26 per cent suspected abnormals by the doctors were accurate indicates a good level of clinical acumen; the 31 per cent of abnormals which were not expected appears to be consistent with routine services elsewhere. Of the four per cent diagnostic results, half were doctor expected, including diabetes, jaundice, gout, myxoedema, cardiovascular degeneration and bone abnormalities.

The wide area of difference in percentage abnormalities found suggests that at least LDH, SGOT, glucose, cholesterol, total bilirubin, urea, uric acid, alkaline phosphatase are the most profitable as they yield at least eight per cent. However, albumin, inorganic phosphate and total proteins have given only three per cent. The calcium result at one per cent is perhaps a little disappointing, but still diagnostically important. It might be worth substituting other tests for the inorganic phosphate.

General practitioners' views

General practitioners were asked by personal contact and questionnaire what they thought of the tests and results; about 50 per cent replied to the questionnaire.

TABLE 5
DOCTORS' OPINIONS

	Per cent
Worth continuing	*92*
Helpful	*89*
Guidance on significance requested	*38*
Complicated	*3*
Unhelpful	*2*
Other tests suggested:	
Potassium	*15*
Sodium	*3*
Serum acid phosphatase	*2*
Protein bound iodine	*1*

Several practitioners volunteered the comment that a telephoned report would save time and where results are grossly abnormal we now provide this service.

The problem of guidance on the significance of abnormal results which are requested by about 38 per cent of practitioners brings into discussion the range of accepted normals and must be influenced by the variations which can occur at every stage in the technical procedure.

Practitioners are aware of areas in which inaccuracy can occur such as wrongly or incompletely labelled specimens. They understand that technical errors can occur and are aware that day-by-day laboratory deviation can be a feature producing spurious results. It is therefore reasonable, at least to the practitioner, that reported results could sometimes be qualified by a comment from the pathologist on the possible clinical significance and where any particular result would best be repeated. It is realised that such comments from busy specialists are not easy to make, but they would help the clinician to evaluate the whole patient and at least 38 per cent of general practitioners would appreciate the effort.

Conclusion

The introduction of multiple analysis into a large teaching hospital group has greatly improved the quality of work performed, the speed with which results can be sent to wards and especially increased efficiency in the department. It has also provided great assistance to the general practitioner in the care of his patients and increased the scope of his interests. The general practitioner's patients show a yield of abnormal results higher than elsewhere. It is encouraging that nine out of twelve tests gave more than eight per cent abnormals. These groups of results helped clinical diagnosis and give good reason for backing the general practitioner's hunch.

REFERENCES

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