Audit of a Battery of Blood Tests in General Medicine Patients

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Abstract

Objectives: To determine if the use of limited tests over a battery of tests would suffice for diagnosis to aid in financial savings. To determine in a population at their initial presentation whether a set of haematological and biochemical investigations enhance the diagnostic process over and above the information gained from clinical history and examination.

Material and Methods: One hundred male patients admitted in general medicine ward of tertiary care hospital formed the study sample. Inclusion criterion was hospital stay of minimum four days. Data like clinical history, laboratory investigations with their repetitions etc were recorded.

Results: CHG, LFT, RFT and serum electrolytes were carried out in 100% cases. Investigations for acute febrile illness (AFI) were done in 58% cases. Investigations were repeated less than or equal to 3 times in 100% AFI investigations, 93.5% for CHG, 89.29% for RFT, 87.93% for LFT. There was no change in clinical diagnosis. Secondary diagnosis was added in 28% cases. Treatment was modified accordingly. Considering the cost factor, it was not worth repeating so many investigations. CHG and blood glucose can be done in every patient irrespective of the clinical presentation as a baseline investigation.

Conclusion: Careful medical history evaluation and physical examination can avoid extensive investigations in patients and the latter should only be ordered if indicated. Thus by selecting specific parameters in laboratory blood tests, an attempt can be made in saving the resources of the institution.

Introduction

A physician aims at diagnosing the clinical condition of the patient with the aid of various biochemical and haematological tests. But only a few parameters are usually sufficient to support or make a correct diagnosis. Thus, a request for few essential specific parameters may help to reach an early diagnosis and reduce the expenses in the process. In a developing country like ours "resource saved is a resource earned", and it may be reallocated to serve a larger cause.

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for at least 4 days. Paediatric patients were excluded from the study. The data collected included age, clinical findings, physical examination, laboratory test, radiological investigations and treatment given to each patient. Informed consent was taken either from the patient or from his relative. Details of the nature, number and results of the laboratory tests were recorded and their reflection on diagnosis and treatment were studied.

The various tests that were studied were liver function test (LFT), renal function test (RFT), complete haemogram (CHG), ELISA for HIV detection, investigations for acute febrile illness (AFI) which include peripheral smear examination for malarial parasites, platelet count, serological tests like Widal, rapid tests for detection of antibodies against dengue and leptospira were studied.

Observations and Results

Maximum number of 62 patients belonged to the age group 16 – 42 years, whereas 4 patients were beyond 76 yrs of age. 77 patients had a ward stay of 4-8 days and only 10 patients had an extended stay of more than 14 days. 4 patients in the study expired while the rest were discharged.

Patients were classified based on the system involved. Table 1 depicts the system wise classification of the patients.

LFT, RFT, CHG, blood glucose, serum electrolytes were done for all the patients irrespective of the clinical diagnosis. While the tests for AFI were done in 58% patients, ELISA for HIV were done in 21 patients, 9 patients had a blood group done and serum amylase was done in 2 patients.

It was observed that RFT was repeated more than thrice in 10% of 84 patients followed by LFT repeated more than three times in 12% of 58 cases. CHG was repeated in 77 cases with 6.5% cases that underwent the test more than 3 times. Blood glucose was repeated only in 37% patients, which was essential. Tests for AFI were repeated in 32% patients. Tests for blood grouping, HIV and serum amylase were not repeated.

The most commonly repeated tests were studied for abnormal results 73% showed abnormal CHG report, whereas RFT, LFT and blood glucose was abnormal in 42%, 47% and 32% cases respectively.

Among the LFT subparameters, direct bilirubin was abnormal in 61% of 39 cases but other parameters showed variation in < 25% cases. Only a single case out of 16 showed an abnormal result for serum cholesterol.

36% had abnormal BUN levels with 16% cases with abnormal serum creatinine levels. Low values for haemoglobin were seen in 64% cases with raised total count and low platelets in 19% cases.

The effect of investigations did not alter the clinical diagnosis in 72% cases, but in 28% patients a secondary diagnosis was added. Table 2 shows the utility of tests in adding the secondary diagnosis.

Discussion

Medicine though an art, obtaining history
and clinical methods have their own limitations. Hence, the need for certain blood tests which may help the clinician to make an accurate diagnosis and evaluate the prognosis.

A study conducted by Szmuk et al in Israel evaluated the clinical significance and cost of routine preoperative laboratory screening in 300 young healthy patients in a public hospital. A new diagnosis due to the laboratory tests was added only in one case. The study revealed that a substantial amount of finances could have been saved, if the tests were tailor made for each patient.

Hesse et al in 1999 showed that there is no medico legal obligation to perform routine diagnostic test and suggested a more selective approach to order preoperative investigations.

487 children who were to undergo plastic surgery were studied by Ansermino et al in Chelmsford, UK. Abnormal results were obtained in 138 cases but were found to be clinically insignificant. Thus, selective discrimination is needed to reduce the cost.

A group of few anaesthetists led by Blery et al in France felt the need to assess abnormal results by their impact on patient and not simply on abnormality yield.

Johnson et al in 2006 found that not much change was made in the management of the cases due to extensive preoperative screening.

Patients in this study group predominantly belonged to 16 -30 yrs of age with a ward stay of 4 -8 days. Four patients who expired were due to aspiration in a case of COPD, cerebral oedema following infarction and two cases of alcoholic liver disease.

Respiratory system involvement was in the form of pneumonia, tuberculosis, COPD, etc. Other systemic involvement were acute gastroenteritis, rheumatic heart disease, congestive cardiac failure, hepatitis, alcoholic liver disease with cirrhosis, stroke, seizures, etc. leg cellulitis, tuberculous lymphadenopathy etc formed the miscellaneous group.

40 patients admitted for acute febrile illness (AFI) which was later confirmed as malaria (30 cases), dengue (1 case), leptospirosis (3 cases) or just pyrexia of unknown origin based on the investigations. In only one case Widal test was found positive indicating typhoid fever.

Our study on a sample size of 100 patients corroborated with the studies done by several authors, demanding patient clinical history and exhaustive clinical methods with discriminate use of laboratory test.

Thus, we conclude that judicious use of investigations which are tailor made for each patient may help to reduce the cost incurred by the patient and the institution at large. Thereby, reducing the expense and reallocation of funds.

**Conclusion**

Complete haemogram and blood glucose levels contributed significantly to a secondary diagnosis. Hence, both the investigations should be done routinely in every patient admitted irrespective of his or her clinical

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**Table 2: Utility of various tests in adding secondary diagnosis**

<table>
<thead>
<tr>
<th>Tests adding secondary diagnosis</th>
<th>No of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHG*</td>
<td>17</td>
</tr>
<tr>
<td>RFT**</td>
<td>5</td>
</tr>
<tr>
<td>LFT***</td>
<td>3</td>
</tr>
<tr>
<td>Tests for AFI</td>
<td>2</td>
</tr>
<tr>
<td>Blood Glucose</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
</tr>
</tbody>
</table>

(CHG – Complete haemogram, RFT – Renal function test, LFT – Liver function test, AFI – Acute febrile illness)
presentation as baseline investigation. LFT, RFT, serum electrolytes can be done only in patients with specific clinical presentation at the discretion of the treating physician.

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References

COMPARATIVE STUDY OF CATHETER DRAINAGE AND NEEDLE ASPIRATION IN MANAGEMENT OF LARGE LIVER ABScessES
To compare the effectiveness of percutaneous catheter drainage (PCD) and percutaneous needle aspiration (PNA) in the management of large (> 10 cm diameter) liver abscesses.
Seventy-two patients with liver abscess (amoebic 48, pyogenic 24) were randomly allocated to PCD or PNA (36 each), which were done within 24 hours of admission.
PNA was successful in 31 of 36 (86%) patients (one aspiration in 10, two in 18, and three in 3 patients), whereas PCD was successful in 35 (97%) patients (p=ns). Duration to attain clinical relief (10.2 [2.0] vs. 8.1 [2.7] days; p=0.02) and parenteral antibiotics needed (15.5 [1.1] vs. 10.9 [2.7] days; p=0.04) were significantly lower in PCD group. Duration of hospital stay was similar in the two groups. One patient with PNA had a subcapsular haematoma and one with PCD had continuous bile leakage which stopped spontaneously. One patient in PCD group died.