HEMOGLOBIN LEVEL EXPLORATION IN THE PATIENTS OF PULMONARY TUBERCULOSIS

BY

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ABSTRACT

The aim of study was to determine the variation in blood Hemoglobin concentration during acute stages of tuberculosis. Hemoglobin is indirect indicator of Tuberculosis. 10 Female patients were included in this study who reported illness in Fatima Jinnah Hospital Quetta. Their Haemoglobin recorded at their admission and after start of treatment at the end of 2nd or 3rd month. The results proved that the tuberculosis patient had decreased Hemoglobin level but their Haemoglobin level start rising when receive medicine and take diet.

Keywords: Pulmonary Tuberculosis, Haemoglobin level; Female patients

INTRODUCTION

Tuberculosis is an important health problem world wide. In industrialized countries, the number of reported cases leveled out in the mid to late 1980s and then starts increasing. The increase also occurred in countries across all continents, leading in 1993 the world Health Organization declare Tuberculosis a global emergency (Rogar and Clive Adward 2003).

Tuberculosis is a communicable chronic granulomatous disease caused by Mycobacterium tuberculosis (Robbins, 1971). Mycobacterium Tuberculosis is the most common cause of Pulmonary Tuberculosis. The disease is highly contagious. Un pasteurized milk from tuberculosis cows has been responsible for much human Tuberculosis (Fair Brothers 1985). Mycobacterium Tuberculosis is transmitted from person to person through respiratory route. The extent of pulmonary disease correlates with the number of organisms in expectorated sputum (Sir Jhon Crofton 1981).

Beside regular tests, Haemoglobin is indirect indicator of tuberculosis. Haemoglobin, a red oxygen carrying pigment is present in red blood cells. It contains non-specific prosthetic group an iron containing pigment called Haem and specific protein part is globulin (Guyton 1981). Haemoglobin molecule has its ability to combine with oxygen. 1g of Haemoglobin combines at normal temperature and pressure with 1.34ml of oxygen. This combination takes place in the lungs and then releases this oxygen in the tissue capillaries where gases tension of O2 much lower in lungs (Walter and Isreal 1996).

The normal Haemoglobin concentration in adult Female is 11.5 to 16 Gram% but in the tuberculosis patient has the low Haemoglobin level. When the level Haemoglobin is lowered then normal condition is known as anemic. The anemia is common complication of pulmonary tuberculosis. It is extremely difficult to distinguish anemia of iron deficiency from anemia of inflammation with the Haemoglobin indication used routinely (Uma Davi 2003). The low Haemoglobin level start rising to receive recommended medicine and take iron containing food.
MATERIAL AND METHODS

Haemoglobin Estimation Test

Haemoglobin Estimation test was observed in Fatima Jinnah Chest Hospital Quetta on blood chemistry analyzer (Micro lab 200). The standard Haemoglobin Kits from human Germany were used for this study. All the precautionary and testing protocol in practice was followed. Photometric Colorimetric Test determination of Haemoglobin in blood is the Cyanmethemoglobin Method (Van Kampen and Zijlstra, 1961).

The Cyanmethemoglobin Method

The method is based on the determination of Cyanmethemolobin, which has been adopted as a standard method. Haemoglobin from a whole blood sample is released from the erythrocytes and is oxidized by ferric anide to methemoglobin. The methemoglobin is further converted by cyanide to the stable cyanmethemoglobin. The absorbance of cyanmethemoglobin is measured at 540 nm and is directly proportional to the Haemoglobin concentration in the sample.

Contents

Reagent A
- 10 x 25 ml Reagent concentrate A
- Potassium hexacyanoferrate (III) 12 mmol/I
- Potassium bicarbonate 230 mmol/I

Reagent B
- 10 x 25 ml Reagent concentration B
- Potassium Cyanide 14 mmol/I
- Potassium bicarbonate 230 mmol/I

Preparation of working reagent

Prepare working Reagent by mixing the contents of one bottle Reagent A and one bottle Reagent B and add 450 ml deionised water. Store Working reagent in a closed dark glass container or bottle and label properly.

Reagent Stability

Regent A and Reagent B are stable up to the stated expiry date when stored in the dark at 15-20 Degree Centigrade. Working Reagent is stable for 12 months at 15…20 Degree Centigrade in the dark, but not longer than the stated expiry of the test Kit. Contamination must be avoided.

Specimen

Capillary blood, EDTA-venous blood are stable for 6 months when stored at 20 Degree Centigrade or for 7 days when stored at 2…25 Degree Centigrade.

Experiment

Pipetting Scheme

<table>
<thead>
<tr>
<th>Pipetting in the tubes</th>
<th>Macro</th>
<th>Semi Micro</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working Reagent</td>
<td>5 ml</td>
<td>1 ml</td>
</tr>
<tr>
<td>Blood</td>
<td>20 micro liter</td>
<td>5 micro liter</td>
</tr>
</tbody>
</table>

Rinse the piptte (Sahl or capillary pipette) several times with working Reagent, mix the reaction solution and read the absorbance after 3 minute at the earliest against reagent blank. The colour of the complex remains stable for about 2 hours when protected from light.

RESULTS AND DISCUSSION

The aim of study was to see the level in Haemoglobin Concentration during the acute stages of Tuberculosis. It is believed that many patients suffering from tuberculosis have decreased blood Haemoglobin level. The low Haemoglobin level is due to the deficiency of iron in diet. And afterward when Anti tuberculosis treatment was started, patients gradually started improving. This diet specially contains iron like milk, eggs and meat. Lots of different fruits contain iron, and the iron in some foods is better absorbed than in others. The iron from meat sources is the best absorbed form.

Haemoglobin Status in Patients under study
10 female patients were included in the study who reported illness at Fatima Jinnah Chest Hospital Quetta. Their Haemoglobin was recorded at the time of admission and then after start of treatment at the end of second and third month. All patients smear positive.

**Table-1:** Ten female patients showing Haemoglobin level before and after TB therapy

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name</th>
<th>Age</th>
<th>Admission date</th>
<th>Hb% at admission</th>
<th>After 2/3 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Lal Khatoon</td>
<td>40</td>
<td>10.2.05</td>
<td>8.7</td>
<td>10.0</td>
</tr>
<tr>
<td>2.</td>
<td>Mah Gul</td>
<td>32</td>
<td>21.10.04</td>
<td>9.2</td>
<td>11.0</td>
</tr>
<tr>
<td>3.</td>
<td>Hajra</td>
<td>40</td>
<td>17.3.05</td>
<td>14.8</td>
<td>15.0</td>
</tr>
<tr>
<td>4.</td>
<td>Bibi Noor</td>
<td>30</td>
<td>14.3.05</td>
<td>13.2</td>
<td>13.7</td>
</tr>
<tr>
<td>5.</td>
<td>Fatima</td>
<td>50</td>
<td>24.2.05</td>
<td>18.2</td>
<td>10.2</td>
</tr>
<tr>
<td>6.</td>
<td>Bibi Aisha</td>
<td>20</td>
<td>1.4.05</td>
<td>10.2</td>
<td>10.9</td>
</tr>
<tr>
<td>7.</td>
<td>Mangori</td>
<td>40</td>
<td>4.4.05</td>
<td>10.2</td>
<td>11.0</td>
</tr>
<tr>
<td>8.</td>
<td>Tamam</td>
<td>15</td>
<td>21.3.05</td>
<td>9.2</td>
<td>12.0</td>
</tr>
<tr>
<td>9.</td>
<td>Zarqa</td>
<td>25</td>
<td>14.3.05</td>
<td>9.3</td>
<td>11.6</td>
</tr>
<tr>
<td>10.</td>
<td>Jan Bakht</td>
<td>60</td>
<td>14.3.05</td>
<td>6.0</td>
<td>7.5</td>
</tr>
</tbody>
</table>

The results regarding 10 female patients of TB are presented in Table-1 which demonstrate that as the patients started receiving recommended medicines for the disease with improved diet containing protein beside other food supplement, Haemoglobin level started rising. This affected his oxygen carrying capacity increase from lungs to other parts of the body which defiantly improved his health and resistance against the disease.

**CONCLUSION**

This study shows that when the patient was diagnosed as pulmonary tuberculosis case and the anti tuberculosis treatment was started at the same time concentration was focused on improving patient’s diet and other food supplements. The patients responded very well and it was clearly observed that in many patients the blood Haemoglobin concentration raised more in comparison with the Haemoglobin level at the start of treatment and diet spout.

**REFERENCES**


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