



King Saud University  
College of Medicine  
Department of Medical Education

**“... pale and tired”**

**Tutorial One**

*Year Two, GASTROINTESTINAL & HAEMATOLOGY Block*

**Curriculum Development Unit**

**Student's Case**

**Case 4; 2013**

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The Template of the PBL Cases is designed by Professor Samy A. Azer.

The Student Case and Tutor Guide are created by

**Professor Samy A. Azer**  
**Dr Farja Al Ghatani**

Aymen Ahmed, a 7-year-old primary school student, comes in, with his father, to see Dr Jamal in his clinic. Aymen always feels tired. His father says, 'Aymen does not like exercising; he is always tired and prefers not to participate in any physical education classes at school. On further questioning, the father says, 'Aymen used to be more active but declined in his activity over the last 10-12 months. A few days ago his mother noticed that he looked pale.'

**Discussion Questions:**

- Are there any difficult words you do not understand?
- List the key information about Aymen.
- Identify Aymen's presenting problems.
- For each problem, make a list of possible causes (generate hypotheses).
- What further information from history and clinical examination would you like to know to help you differentiate between your hypotheses?

Aymen used to be active in sport when he was 5-6 years old. Over the last 10-12 months he has become increasingly tired and short of breath after any brief exercising. Because of his repeated decline to participate in exercise classes, the school asked his father to sign a form that Aymen could be relieved from exercise classes. This made his parents become worried about Aymen's health and willing to check with the family doctor. Recently, Aymen's mother noticed that he looks pale and is not active as he used to be. He becomes short of breath after brief exercising.

**Past medical history**

No history of bronchial asthma. He has no history of blood loss, blood transfusion or hospital admission. Aymen was born in a small village in Jeezan region with the assistance of a midwife. His mother was not seen by a doctor during her pregnancy.

**Family history**

His half-brother, Mohammad, is 16 years old. Mohammad lives in Lebanon with his Lebanese father. He is always ill and needs blood transfusion nearly every month. Aymen's father can't remember the name of the condition.

**Allergies**

Nil

**Social history**

Because of his tiredness, Aymen usually goes to bed early and on several occasions does not complete his homework. His school report shows a decline in his performance in most subjects. Aymen has recently moved with his family to Riyadh. The family used to live in Jeezan and, Aymen misses his friends and cousins a lot. He is not happy because he has no friends at his new school. His father wonders if this may have caused Aymen's problem.

**Clinical Examination**

Aymen looks pale. He has no problems with his skeletal muscles. His vital signs are normal except for increased pulse rate of 105/min (tachycardia).

**Cardiovascular and respiratory systems**

Normal

**Abdominal examination**

Liver and spleen are not palpable.

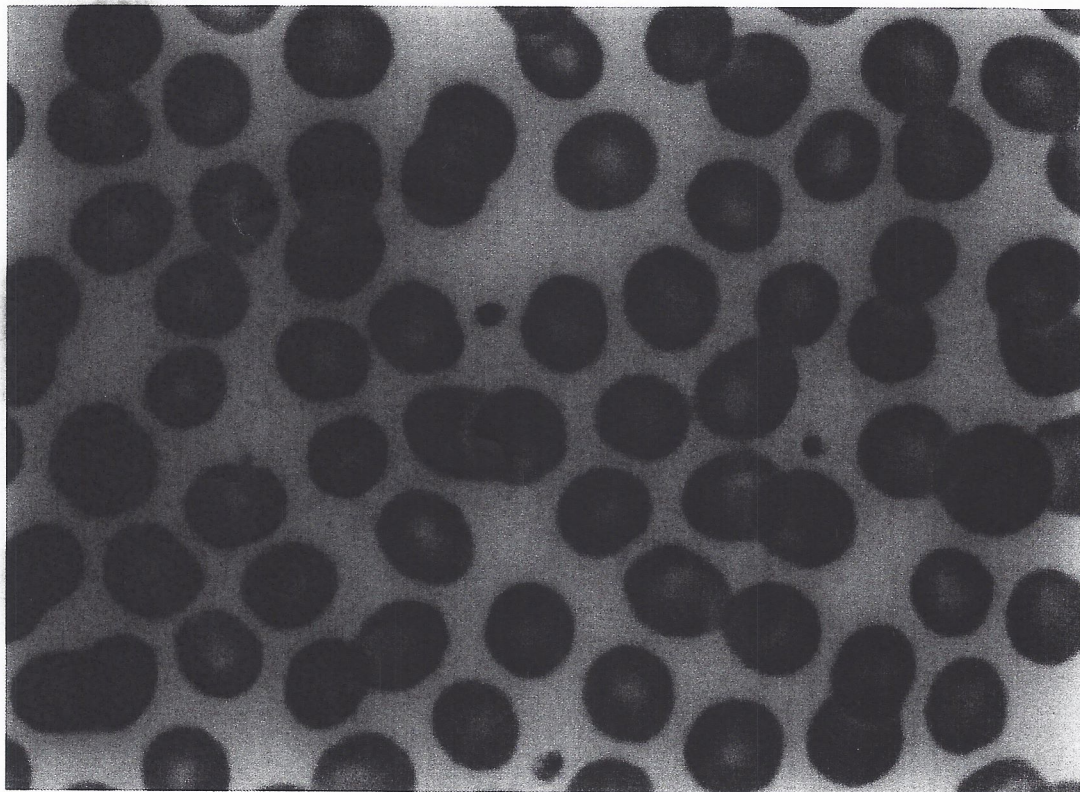
**Discussion Questions:**

- Are there any difficult words you do not understand?
- List the key information in this progress.
- Identify any new problems and add to your list.
- For each new problem, make a list of possible causes (generate hypotheses).
- What laboratory tests would you like to order for Aymen to help you differentiate between your hypotheses?

Because of Aymen's pallor, Dr Jamal arranges for some blood tests. The results are shown below:

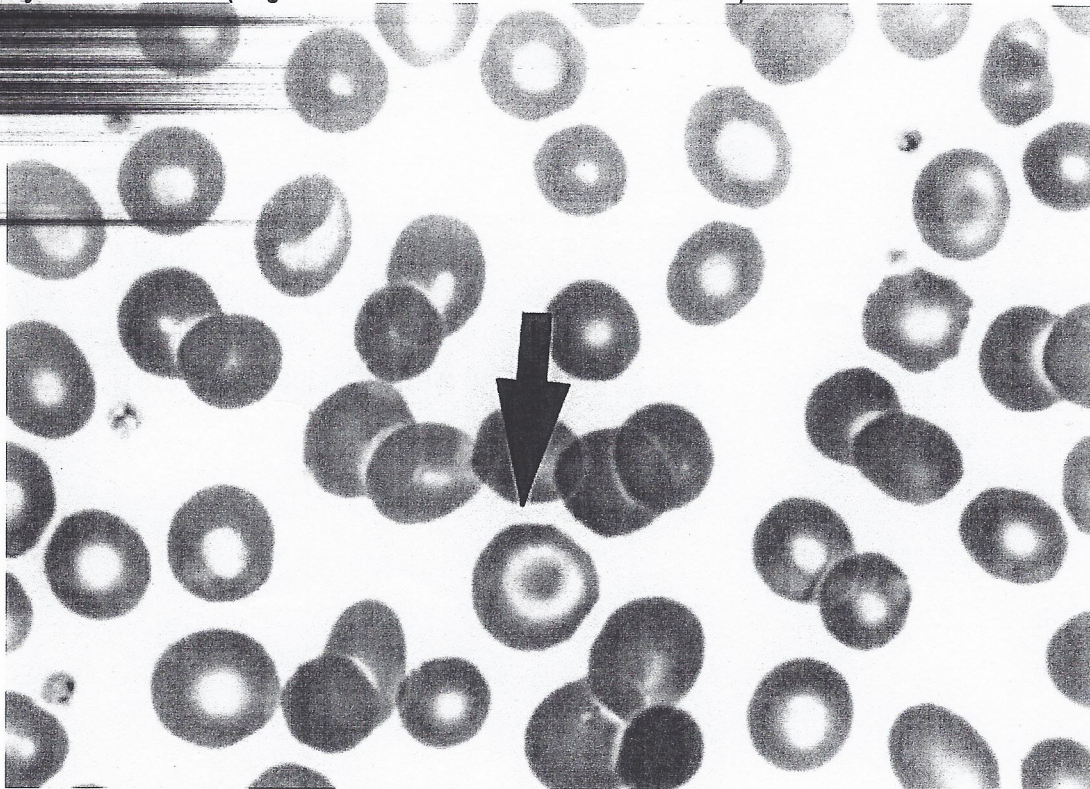
Blood test	Aymen's results	Normal Range
Haemoglobin (Hb)	78	130-170 g/L
Mean corpuscular volume (MCV)	78	83-101 fL
Mean corpuscular haemoglobin (MCH)	26	27-32 pg
Platelets count	200	150-400 x 10 <sup>9</sup> /L

#### Normal blood film



Source: Atlas of Hematology (Medyczne Wydawnictwo Multimedialne ©)

**Aymen's blood film (magnified one and a half times the normal film)**



Source: Atlas of Hematology (Medyczne Wydawnictwo Multimedialne ©)

**Blood film report:**

Aymen's blood film shows:

- Hypochromasia (red blood cells are paler than normal cells)
- Microcytosis (red blood cells are smaller than normal cells)
- Polychromasia (red blood cells tend to be stained with acid and basic dyes)
- Target cells (red blood cells with a dark centre surrounded by a light band that again is encircled by a darker ring. It resembles a shooting target. An example of a target cell is indicated by an arrow).
- Anisocytosis (significant variations in the size of red blood cells)

**Discussion Questions:**

- Are there any difficult words you do not understand?
- Summarize the new information obtained from the blood tests.
- What is your interpretation of these changes?
- On the basis of the information obtained from the history, and the blood tests, do you need to make any changes to your hypotheses?
- What should Dr Jamal do next?

Because of the low MCV, MCH and the presence of microcytic hypochromic red blood cells, Dr Jamal decides to do further tests to confirm iron-deficiency anaemia. He arranges for more blood tests for Aymen.

As the results of the blood tests become available, both parents come to see Dr Jamal. See the results below:

Blood test	Aymen's results	Normal Range
Serum iron	31	9-30 $\mu\text{mol/L}$
Serum ferritin	120	10-120 $\mu\text{g/L}$
Serum transferrin	2.5	2.0-4.0 g/L

Dr Jamal says, "The blood tests show that Aymen has anaemia. This explains his tiredness, pallor and shortness of breath after little exercising. Anaemia means that Aymen has less than normal haemoglobin and his red blood cells are unable to carry oxygen in a way that covers the needs of his body. After reading Aymen's blood results, Dr Jamal decides to arrange for another blood test called "haemoglobin electrophoresis".

#### Discussion Questions:

- Are there any difficult words you do not understand?
- Summarize the new information obtained from the blood tests.
- Do you think that Aymen's anaemia is due to iron-deficiency? Explain your answers.
- In what way can the haemoglobin electrophoresis test of help?
- Do you know a Nobel prize laureate whose work has contributed to the advancement of our knowledge in physiology and/or pharmacology related to this case? What was exactly his/her work about?
- What are your learning issues?

## Resources

*A note to students:* You are not required to read all these textbooks and resources to prepare for your learning issues. You should use one textbook or one resource for each discipline. For example, for this case you will need to use a resource covering issues related to the case from four disciplines: Physiology, Histology, and Medicine. Once you have identified your learning resources, research them for your learning issues and the questions raised in the group discussion. You might choose to use alternative resources other than those listed below:

### Textbooks:

- Rhoades R, and Pflanzer R. Human Physiology, 4<sup>th</sup> ed. London: Brooks/Cole, 2003.
- Drake RL, Vogl W, Mitchell AWM. Gray's anatomy for students. Philadelphia: Elsevier Churchill Livingstone, 2005.
- Guyton AC and Hall JE. Textbook of Medical Physiology. 10<sup>th</sup> ed. Philadelphia: WB Saunders & Co, 2000.
- Gartner LP and Hiatt JL. Color Textbook of Histology. 2<sup>nd</sup> ed. Philadelphia: WB Saunders & Co, 2001.
- Kumar P and Clark M. Clinical Medicine. 5<sup>th</sup> ed. Edinburgh: WB Saunders, 2002.
- Fox SI. Human Physiology, 9<sup>th</sup> Ed. McGraw Hill, 2005

### Educational websites:

Thalassaemia Intermedia, available free at:

<http://www.emedicine.com/ped/topic2232.htm>

This eChapter introduces you to main clinical concepts on Thalassaemia. Focus on the background, pathophysiology, history, causes and lab studies.