V. N. KARAZIN KHARKIV NATIONAL UNIVERSITY
MEDICAL SCHOOL
PROPEDEUTICS OF INTERNAL MEDICINE AND PHYSICAL REHABILITATION DEPARTMENT

Undiagnosed Anemia Under "Mask" of Cardiac Symptoms

Speakers: students of IV course, gr. BA-416: Santos Castelo, Luiz Henrique; De Araujo, William Matheus

Scientific Supervisor: A.I. Lakhonina, Assistant professor;

T.V. Zolotareva, Assistant professor

Head of the Department: M.S. Brynza, Candidate of Medicine

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Iron Deficiency. Definition

- Iron deficiency is a health-related condition in which iron availability is insufficient to meet the body's needs and which can be present with or without anemia.
- Anemia is defined as a reduced number of red blood cells (RBCs) or less than the normal amount of hemoglobin (Hb) in the blood. It can also be defined as a lowered ability of the blood to carry oxygen.

Epidemiology:

- According to WHO in 2005 around 1.62 billion people were suffering from different types of anemia, which number is increasing fast.
- Iron Deficiency Anemia (IDA) accounts approximately 610 million of people worldwide, 8.8% of world population.
- Females are the most affected (9.9%) comparing to males (7.8%).

Symptoms of Iron Deficiency:

- Extreme fatigue;
- Pale skin;
- Weakness;
- Chest pain, increase of heart rate or shortness of breath;
- Headache or dizziness;
- Cold extremities;
- Brittle nails;
- Poor appetite, mainly in infants and children.

The Aim of this study:

- to study clinical case of IDA which was manifested by cardiac symptoms with an early treatment and a positive prognosis.

Passport Part:

- Age: 56 year old;
- Gender: Female;
- Occupation: Housewife;
- Address: village citizen.

Complains

- General weakness;
- Apathy;
- Palpitation;
- Periodical headache;
- Shortness of breath when walking more than 500 m.

Anamnesis Morbi:

- The patient reported that her “health” began to *deteriorate during months ago*.
- She *denied* any bleeding, change in taste, and haven’t undergo any operations and blood transfusions.
- The patient wasn’t examined and treated previously.

Anamnesis Vitae:

- Was born in a full family, developed according to age;
- Denies tuberculosis, diabetes, malaria, viral hepatitis, sexually transmitted diseases and AIDS;
- *Denies* presents of any *cardiovascular diseases* such as arterial hypertension, angina pectoris, heart failure;
- Denies allergic reactions to drugs;
- Non-smoker;
- Denies alcohol consumption;
- *Sedentary lifestyle;*
- *Nutrition: poor* (eats little meat and fruits due to financial reasons);
- Obstetrical-gynecological history: 1 pregnancy with 1 vaginal delivery; menopause during 4 years.

Objective Examination 1/3:

- *The general condition* of the patient was *satisfactory*;
- The patient had *clear consciousness* and *active posture*;
- She did not have any problem about orientation of place, time and person (herself);
- Hypersthenic, height 170 cm, weight 85 kg, BMI = 29.4 kg / m^2, waist-to-hip ratio 0,87;
- *Severe pallor* of the face;
- *Dryness* of the skin and mucous membranes;
- Peripheral lymph nodes are not palpable;
- The thyroid is not palpable.

Objective Examination 2/3:

- *Respiratory System*:
- percussion – resonant sound;
- auscultation - vesicular breathing, no adventitious sounds.
- *Cardiovascular system:*
- Muffled heart tones;
- Tachycardia;
- Blood pressure (BP): 130/100 mm Hg;
- Heart rate (HR): 95 bpm, regular; Ps= 95 bpm. No pulse deficiency.

Objective Examination 3/3:

- Gastrointestinal system: Abdomen is soft, painless, symmetrical, no discrepancies of the abdominal muscles;
- No visible peristalsis;
- Liver edge is smooth, painless , palpated at the level of costal arch;
- Spleen and pancreas are not palpable;
- Normal physiological functions;
- No swelling present.

Preliminary Diagnosis:

- Suspected
- Arterial Hypertension?
- Anemia?

Plan of Investigation:

Examination, completed outpatient

- Complete Blood Count (CBC);
- Biochemical blood test (Serum iron(SI), Transferrin saturation(TS), Serum ferritin (SF), Total Iron-binding capacity (TIBS));
- General urine test;
- Electrocardiography (ECG);
- Abdominal and Retro-abdominal Organs Ultrasound;
- Pelvic Ultrasound;
- Gynecologic Examination.

Recommended additional examination

- Blood glucose level (HbA1c);
- Serum B12;
- Gastroscopy.

This tests wasn't completed for financial reasons.

Laboratory Test 1/6:

Complete blood count		
Measure	**Result**	**Normal Range**
Hemoglobin (Hb)	80	120 - 160 g/L
Red blood cells (RBCs)	$2.2*10^{12}$	$3.5 - 5.5*10^{12}$ cell/L
Mean corpuscular volume(MCV)	72	80 - 100 fL/red cell
White blood cells (WBCs)	$5.5*10^{9}$	$4.5 - 11.0*10^{9}$ cell/L
Plataletes (PLT)	$280*10^{9}$	$150 - 400*10^{9}$ cell/L
ESR	24	0 - 20 mm/h

Conclusion: Low levels of Hb, RBC and MCV indicates **Microcytic Anemia.**

Laboratory Test 2/6

Biochemical blood test		
Measure	**Result**	**Normal Range**
Serum iron	7.75	11 - 29 mcmol/L
TIBC	92	45 - 82 mcmol/L
Trans. Sat	9	20 - 50 %
Ser. Ferr	8	15 - 200 ng/ml

Conclusion: Due to the low levels of serum iron, transferrin saturation, serum ferritin and high level of TIBC indicates **IDA**.

Laboratory Test 3/6:

General urine test		
Measure	**Result**	**Normal range**
Specific gravity	1.011	1,001-1,040
Reaction	6,5	5,0-7,0
Protein	0.003	To 0.033 g / l
Glucose	0	Absent
Leucocytes	2-3	6-8
Epithelium transition	Not detected	Not detected
Bacteria	Not detected	Not detected

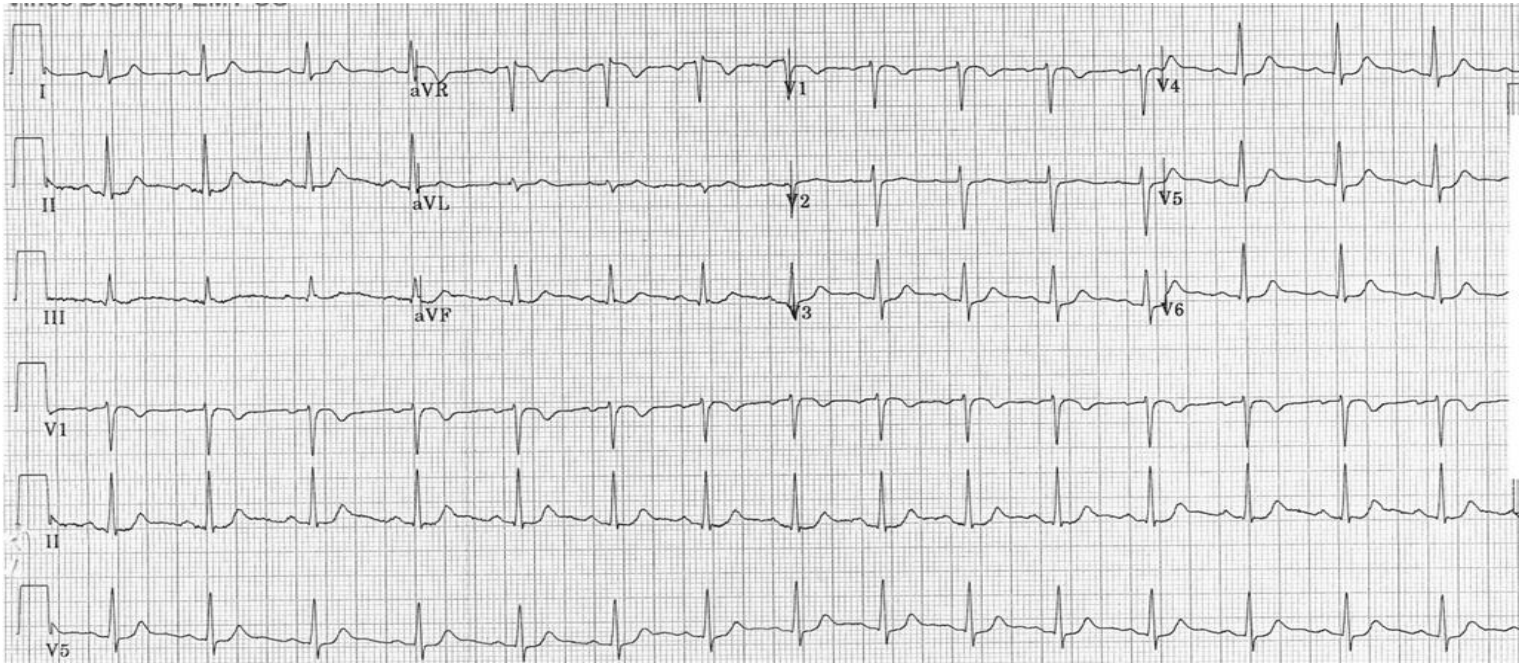
Conclusion: normal.

Home measurements of BP 4/6

	Morning (mm Hg)	Evening (mm Hg)
1 day	100/70	110/75
2 day	110/70	115/75
3 day	100/70	110/80
4 day	115/75	110/70

Laboratory Test 5/6:

ECG



Conclusion: Sinus rhythm, regular, tachycardia HR = 94 bpm.

Laboratory Test 6/6:

- Ultrasound: signs of chronic cholecystitis and pancreatitis;
- Pelvic Ultrasound: age changes without pathological formations;
- Gynecologic Examination: without pathological changes.

The clinical diagnosis according to current classifications

Haemoglobin levels to diagnose anaemia (g/l)

Population	Non - Anaemia	Mild Anaemia	Moderate Anaemia	Severe Anaemia
Children 6 - 59 months of age	110 or higher	100-109	70-79	Lower than 70
Children 5 - 11 years of age	115 or higher	110-114	80-109	Lower than 80
Children 12 - 14 years of age	120 or higher	110-119	80-109	Lower than 80
Non-pregnant women	120 or higher	110-119	80-109	Lower than 80
Pregnant women	130 or higher	100-109	70-99	Lower than 70
Men (15 years of age and above)	110 or higher	110-129	80-109	Lower than 80

Interpretation of Iron Studies

Measure	Iron Deficiency Anemia	Anemia of chronic disease
Serum Iron	Decrease	Decrease
Serum total binding capacity	Increase	Decrease
Serum ferritin	Decrease	Increase or normal

Arterial Hypertension?

The results of home blood pressure measurement don’t confirm the diagnosis Arterial Hypertension

Clinical Diagnosis:

- Moderate Iron Deficiency Anemia of Unknown Origin.

Non-medication treatment

- Lifestyle modifications;
- Dietary recommendations:
  - "Meat: beef, pork, or lamb, especially organ meats such as liver; Poultry: chicken, turkey, and duck, especially liver and dark meat; Fish, especially shellfish, sardines, and anchovies; Leafy green members of the cabbage family including broccoli, kale, turnip greens, and collard greens; Legumes, including lima beans, peas, pinto beans, and black - eyed peas; Iron - enriched pastas, grains, rice, and cereals";
  - Patients should be strictly warned against a "tea and toast diet" as tea strongly blocks iron absorption;
  - Activity Restriction;
  - Patients with moderately severe iron deficiency anemia should limit their activities until the anemia is corrected with iron therapy.

(According to the American Society of Hematology)

Medication treatment:

- Iron (III) hydroxide polymaltose complex 100 mg twice a day;

Follow Up 1 (after 1 week of treatment):

- The general condition of the patient improved with the decreasing of weakness and dyspnea;
- HR= 72 bpm, BP 110/70 mm Hg (ambulatory control).

CBC		
Hb	92	120 - 160 g/L
RBCs	$2.8*10^{12}$	$3.5 - 5.5*10^{12}$ cell/L
MCV	75	80 - 100 fL/red cell
WBCs	$3.8*10^{9}$	$4.5 - 11.0*10^{9}$ cell/L
PLT	$290*10^{9}$	$150 - 400*10^{9}$ cell/L
ESR	20	0 - 20 mm/h

Conclusion: Hb incresed, RBCs increased. The results of the laboratory test it is shown that the treatment is being effective.

Follow Up 2 (two weeks of treatment):

HR= 72 bpm, BP 112/65 mm Hg (ambulatory control).

CBC			Biochemical blood test		
Hb	108	120 - 160 g/L	**SI**	8.2	11 - 29 mcmol/L
RBCs	$3,0*10^{12}$	$3.5 - 5.5*10^{12}$ cell/L	**TIBC**	87	45 - 82 mcmol/L
MCV	78	80 - 100 fL/red cell	**TS**	13	20 - 50 %
WBCs	$3.9* 10^{9}$	$4.5 - 11.0*10^{9}$ cell/L	**SF**	11	15 - 200 ng/ml
PLT	$320*10^{9}$	$150 - 400*10^{9}$ cell/L			
ESR	22	0 - 20 mm/h			

Conclusion: Serum iron, TIBS, Serum ferritin – increase. The results of the laboratory test it is shown that the treatment is further improving.

Recommendations:

- Prolonged following a dietary recommendations.
- The therapy was prolonged under control of CBC and biochemical blood test 1 time per 2 weeks.
- To find out origin of anemia patient was recommended to do a gastroscopy - she denied, so was purposed to do gastroscopy with general anesthesia.

Conclusion:

- Cardiac symptoms of elderly patients are primarily considered as manifestations of the cardiovascular diseases.
- However, these may be symptoms of IDA, as we can see in our clinical case.
- Due to qualitatively examination it became possible to differentiate anemia from cardiac disease and effectively treat the patient.
- The actual cause of the disease must be studied further due to a high risk of relapse.

Thank you for attention

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