Biomedical Laboratory Sciences

Mónica Silva

Clinical Case

Hematology

BLS ACADEMY
BIOMEDICAL LABORATORY SCIENCE

BioTriCK

Polytechnic of Coimbra

Introduction

PATIENT

- Male
- 49 years old
- Returned to Portugal 3 days ago, from Guinea
- Reports two previous Malaria infections in 2011 and 2021
- Type 2 Diabetes Mellitus

PHYSICAL EXAM

- Slightly pale
- Dehydrated
- No presence of cyanosis
- No breathing difficulties
- No edemas on the lower limbs

Introduction

Prescribed examinations:

- Chest X-ray
- Hematological analysis → Tube with EDTA anticoagulant

- Biochemical analysis
- Arterial blood gas → Tube with heparin

Methods and results

Hematological analysis

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performed on the automatic hematological analyzer Sysmex XN-2000

Complete analysis of hematopoiesis with differential leukocyte count by Flow Cytometry

Arterial blood gas

↓

performed on automatic equipment GEM 3500

Methods and results

Hematological Results

Parameter	Value obtained	Reference Values
Erythrocytes	4,95	4,2 – 5,4 millions/µL
Hemoglobin	16,1	13,2 – 17,2 g/dL
Hematocrit	43,9	41,0 – 51,0 %
MCV	88,7	80,1 – 96,1 fL
MCH	32,5	26,7 – 30,7 pg
MCHC	36,7	31,7 – 35,7 g/dL
RDW	11,5	< 15%
Leukocytes	4770	4 000 – 10 000
Neutrophils	62,9	55 - 75%
Eosinophils	0,6	1 – 3%
Basophils	0,4	0 - 2%
Lymphocytes	22,6	17 - 33%
Monocytes	9,9	5 - 9%
Immature Granulocytes	3,6	0 - 3%
Platelets	17000	150 000 – 400 000

Methods and results

Biochemical Results

Parameter	Value obtained	Reference Values
Glycose	217	70 – 100 mg/dL
Sodium	130	136 – 145 mmol/L
Potassium	4,2	3,5 – 5,1 mmol/L
C Reactive Protein	7,2	< 0,51 mh/dL

Methods and results

Arterial Blood Gas Results

Parameter	Value obtained	Reference Values
pH	7,43	7,35 – 7,45
pCO2	31	35 – 45 mmHg
pO2	95	75 – 100 mmHg
HCO3-c	20,6	
HCO3-std	22,8	
ctCO2	21,6	
tHb	13	12 – 18 g/dL
Hct	42	
sO2	98	92 – 98%
Glycose	262	65 – 95 mg/dL
Lactate	1,9	< 1,8 mmol/L
Na+	130	135 – 145 mmol/L
K+	4,5	3,50 – 5,30 mmol/L
Ca2+	1,10	1,13 – 1,30 mmol/L

Discussion

Chest X-ray	Chest X-ray revealed normal, no infiltrates
Hematological analysis	Laboratory results reveal a slight hyperchromia and marked thrombocytopenia.
Biochemical analysis	The patient has increased glucose values, which are not significant since the patient is diabetic and was not fasting at the time of blood collection.
Arterial blood gas	It has a slightly decreased carbon dioxide pressure, not being a significant value and a slight hyponatremia due to the patient's dehydration.

Discussion

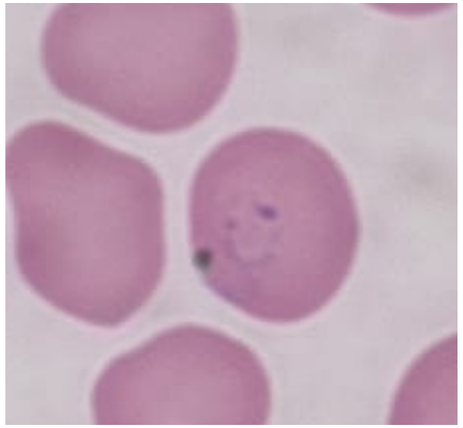
Since the user comes from an endemic country, a possible infection with ... **MALARIA**

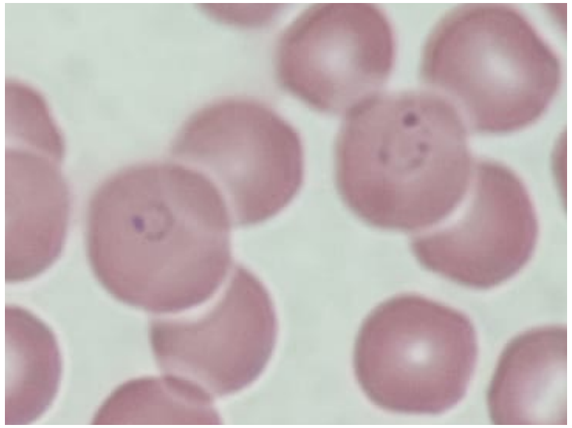
Performed rapid test for *Plasmodium* research, which allows detecting the presence of specific antigens of *Plasmodium falciparum* and other *Plasmodium* species, through the chromatography technique.

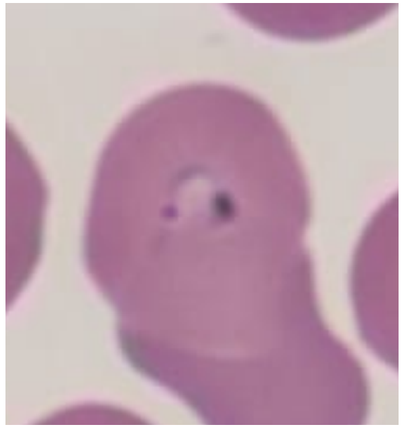
Positive for *Plasmodium falciparum*

Discussion

Peripheral blood smear → Confirmation of Malaria and calculation of parasitemia





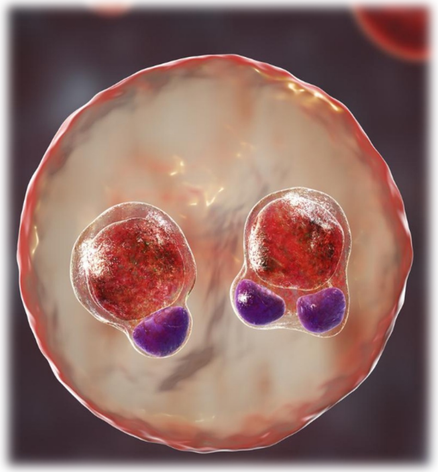


Parasitaemia – 12,4%

Conclusion

MALARIA

- Disease transmitted by mosquito bite of the genus *Anopheles*
- Incubation period is between 7 to 30 days after the bite
- Disease that can be prevented and treated with the use of antimalarial drugs



Plasmodium falciparum

- Associated with more than 90% of global malaria mortality
- Associated with more severe forms of the disease, since it has the ability to prevent the destruction of infected erythrocytes

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