

**Dr. Vinay Chopra**  
 MD (Pathology & Microbiology)  
 Chairman & Consultant Pathologist

**Dr. Yugam Chopra**  
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 CEO & Consultant Pathologist

<b>NAME</b>	: Mr. SMILE	<b>PATIENT ID</b>	: 1717086
<b>AGE/ GENDER</b>	: 28 YRS/MALE	<b>REG. NO./LAB NO.</b>	: 012501060044
<b>COLLECTED BY</b>	:	<b>REGISTRATION DATE</b>	: 06/Jan/2025 01:54 PM
<b>REFERRED BY</b>	: LOOMBA HOSPITAL (AMBALA CANTT)	<b>COLLECTION DATE</b>	: 06/Jan/2025 02:00PM
<b>BARCODE NO.</b>	: 01523540	<b>REPORTING DATE</b>	: 06/Jan/2025 02:12PM
<b>CLIENT CODE.</b>	: KOS DIAGNOSTIC LAB		
<b>CLIENT ADDRESS</b>	: 6349/1, NICHOLSON ROAD, AMBALA CANTT		

Test Name	Value	Unit	Biological Reference interval
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### HAEMATOLOGY

#### HAEMOGLOBIN (HB)

HAEMOGLOBIN (HB) by CALORIMETRIC	14	gm/dL	12.0 - 17.0
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#### INTERPRETATION:-

Hemoglobin is the protein molecule in red blood cells that carries oxygen from the lungs to the body's tissues and returns carbon dioxide from the tissues back to the lungs.

A low hemoglobin level is referred to as ANEMIA or low red blood count.

#### ANEMIA ( DECREASED HAEMOGLOBIN):

- 1) Loss of blood (traumatic injury, surgery, bleeding, colon cancer or stomach ulcer)
- 2) Nutritional deficiency (iron, vitamin B12, folate)
- 3) Bone marrow problems (replacement of bone marrow by cancer)
- 4) Suppression by red blood cell synthesis by chemotherapy drugs
- 5) Kidney failure
- 6) Abnormal hemoglobin structure (sickle cell anemia or thalassemia).

#### POLYCYTHEMIA (INCREASED HAEMOGLOBIN):

- 1) People in higher altitudes (Physiological)
- 2) Smoking (Secondary Polycythemia)
- 3) Dehydration produces a falsely rise in hemoglobin due to increased haemoconcentration
- 4) Advanced lung disease (for example, emphysema)
- 5) Certain tumors
- 6) A disorder of the bone marrow known as polycythemia rubra vera,
- 7) Abuse of the drug erythropoietin (Epogen) by athletes for blood doping purposes (increasing the amount of oxygen available to the body by chemically raising the production of red blood cells).

**NOTE: TEST CONDUCTED ON EDTA WHOLE BLOOD**



  
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<b>BARCODE NO.</b>	: 01523540	<b>REPORTING DATE</b>	: 07/Jan/2025 05:46AM
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### HAEMOGLOBIN - HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HB-HPLC)

#### HAEMOGLOBIN VARIANTS

HAEMOGLOBIN A0 (ADULT) <i>by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)</i>	86.5	%	83.00 - 90.00
HAEMOGLOBIN F (FOETAL) <i>by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)</i>	<0.8	%	0.00 - 2.0
HAEMOGLOBIN A2 <i>by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)</i>	3	%	1.50 - 3.70
PEAK 3 <i>by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)</i>	4.5	%	< 10.0
OTHERS-NON SPECIFIC <i>by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)</i>	ABSENT	%	ABSENT
HAEMOGLOBIN S <i>by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)</i>	NOT DETECTED	%	< 0.02
HAEMOGLOBIN D (PUNJAB) <i>by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)</i>	NOT DETECTED	%	< 0.02
HAEMOGLOBIN E <i>by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)</i>	NOT DETECTED	%	< 0.02
HAEMOGLOBIN C <i>by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)</i>	NOT DETECTED	%	< 0.02
UNKNOWN UNIDENTIFIED VARIANTS <i>by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)</i>	NOT DETECTED	%	< 0.02
GLYCOSYLATED HAEMOGLOBIN (HbA1c): WHOLE BLOOD <i>by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)</i>	4.9	%	4.0 - 6.4

#### RED BLOOD CELLS (RBCS) COUNT AND INDICES

HAEMOGLOBIN (HB) <i>by AUTOMATED HEMATOLOGY ANALYZER</i>	14	gm/dL	12.0 - 17.0
RED BLOOD CELL (RBC) COUNT <i>by AUTOMATED HEMATOLOGY ANALYZER</i>	4.66	Millions/cmm	3.50 - 5.00
PACKED CELL VOLUME (PCV) <i>by AUTOMATED HEMATOLOGY ANALYZER</i>	44	%	40.0 - 54.0
MEAN CORPUSCULAR VOLUME (MCV) <i>by AUTOMATED HEMATOLOGY ANALYZER</i>	94.5	fL	80.0 - 100.0
MEAN CORPUSCULAR HAEMOGLOBIN (MCH) <i>by AUTOMATED HEMATOLOGY ANALYZER</i>	30.1	pg	27.0 - 34.0



  
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MEAN CORPUSCULAR HEMOGLOBIN CONC. (MCHC) <i>by AUTOMATED HEMATOLOGY ANALYZER</i>	31.9 <sup>L</sup>	g/dL	32.0 - 36.0
RED CELL DISTRIBUTION WIDTH (RDW-CV) <i>by AUTOMATED HEMATOLOGY ANALYZER</i>	13.9	%	11.00 - 16.00
RED CELL DISTRIBUTION WIDTH (RDW-SD) <i>by AUTOMATED HEMATOLOGY ANALYZER</i>	49	fL	35.0 - 56.0
<b>OTHERS</b>			
NAKED EYE SINGLE TUBE RED CELL OSMOTIC FRAGILITY TEST <i>by SINGLE RED CELL OSMOTIC FRAGILITY</i>	NEGATIVE (-ve)		NEGATIVE (-ve)
MENTZERS INDEX <i>by CALCULATED</i>	20.28	RATIO	BETA THALASSEMIA TRAIT: < 13.0 IRON DEFICIENCY ANEMIA: >13.0

## INTERPRETATION

THE ABOVE FINDINGS ARE SUGGESTIVE OF NORMAL HAEMOGLOBIN CHROMATOGRAPHIC PATTERN

### INTERPRETATION:

The Thalassemia syndromes, considered the most common genetic disorder worldwide, are a heterogenous group of mendelian disorders, all characterized by a lack of/or decreased synthesis of either the alpha-globin chains (alpha thalassemia) or the beta-globin chains (beta thalassemia) of haemoglobin.

### HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC):

1. HAEMOGLOBIN VARIANT ANALYSIS, BLOOD- High Performance liquid chromatography (HPLC) is a fast & accurate method for determining the presence and for quantitation of various types of normal haemoglobin and common abnormal hb variants, including but not limited to Hb S, C, E, D and Beta -thalassemia.
2. The diagnosis of these abnormal haemoglobin should be confirmed by DNA analysis.
3. The method use has a limited role in the diagnosis of alpha thalassemia.
4. Slight elevation in haemoglobin A2 may also occur in hyperthyroidism or when there is deficiency of vitamin b12 or folate and this should be distinguished from inherited elevation of HbA2 in Beta- thalassemia trait.

### NAKED EYE SINGLE TUBE RED CELL OSMOTIC FRAGILITY TEST (NESTROFT):

1. It is a screening test to distinguish beta thalassemia trait. Also called as Naked Eye Single Tube Red Cell Osmotic Fragility Test.
2. The test showed a sensitivity of 100%, specificity of 85.47%, a positive predictive value of 66% and a negative predictive value of 100%.
3. A high negative predictive value can reasonably rule out beta thalassemia trait cases. So, it should be adopted as a screening test for beta thalassemia trait, as it is not practical or feasible to employ HbA2 in every case of anemia in childhood.

### MENTZERS INDEX:

1. The Mentzer index, helpful in differentiating iron deficiency anemia from beta thalassemia. If a CBC indicates microcytic anemia, the Mentzer index is said to be a method of distinguishing between them.
2. If the index is less than 13, thalassemia is said to be more likely. If the result is greater than 13, then iron-deficiency anemia is said to be more likely.
3. The principle involved is as follows: In iron deficiency, the marrow cannot produce as many RBCs and they are small (microcytic), so the RBC



  
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count and the MCV will both be low, and as a result, the index will be greater than 13. Conversely, in thalassemia, which is a disorder of globin synthesis, the number of RBC's produced is normal, but the cells are smaller and more fragile. Therefore, the RBC count is normal, but the MCV is low, so the index will be less than 13.

**NOTE:** In practice, the Mentzer index is not a reliable indicator and should not, by itself, be used to differentiate. In addition, it would be possible for a patient with a microcytic anemia to have both iron deficiency and thalassemia, in which case the index would only suggest iron deficiency.

\*\*\* End Of Report \*\*\*



  
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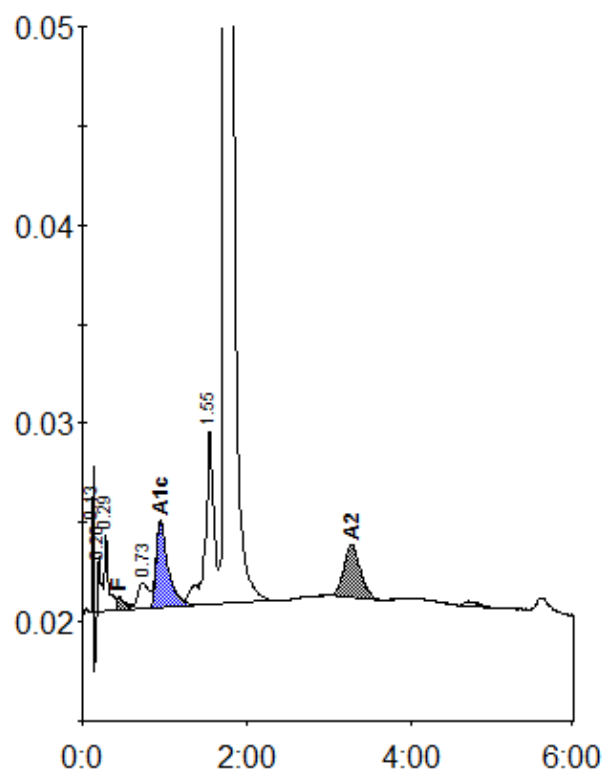




# Patient report

Bio-Rad  
D-10  
S/N: #DJ6F040603  
Sample ID:  
Injection date  
Injection #: 2  
Rack #: ---

DATE: 01/06/2025  
TIME: 05:51 PM  
Software version: 4.30-2  
01523540  
01/06/2025 05:15 PM  
Method: HbA2/F  
Rack position: 2



Peak table - ID: 01523540

Peak	R.time	Height	Area	Area %
Unknown	0.13	7616	5959	0.4
A1a	0.20	2833	8802	0.6
A1b	0.29	3898	12916	0.9
F	0.45	723	5689	< 0.8 *
LA1c/CHb-1	0.73	1352	12041	0.9
A1c	0.95	4369	44246	4.9
P3	1.55	8806	63922	4.5
A0	1.73	287678	1222056	86.5
A2	3.27	2665	37098	3.0
Total Area:	1412729			

Concentration:	%
F	< 0.8 *
A1c	4.9
A2	3.0