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

Dr. Yugam Chopra
MD (Pathology)
CEO & Consultant Pathologist

NAME	**: Mrs. NADITA**		
AGE/ GENDER	: 22 YRS/FEMALE	**PATIENT ID**	: 1538085
COLLECTED BY	:	**REG. NO./LAB NO.**	**: 012407040030**
REFERRED BY	:	**REGISTRATION DATE**	: 04/Jul/2024 10:46 AM
BARCODE NO.	: 01512505	**COLLECTION DATE**	: 04/Jul/2024 10:50AM
CLIENT CODE.	: KOS DIAGNOSTIC LAB	**REPORTING DATE**	: 04/Jul/2024 11:11AM
CLIENT ADDRESS	: 6349/1, NICHOLSON ROAD, AMBALA CANTT		

Test Name	Value	Unit	Biological Reference interval

HAEMATOLOGY

HAEMOGLOBIN (HB)

HAEMOGLOBIN (HB) *by CALORIMETRIC*	**9.3^{L}**	**gm/dL**	**12.0 - 16.0**

INTERPRETATION:-

Hemoglobin is the protein molecule in red blood cells that carries oxygen from the lungs to the bodys 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 (DECRESED 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 erythropoetin (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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HAEMOGLOBIN - HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HB-HPLC)

Test Name	Value	Unit	Biological Reference interval
HAEMOGLOBIN VARIANTS			
HAEMOGLOBIN A0 (ADULT) *by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)*	87.9	%	83.00 - 90.00
HAEMOGLOBIN F (FOETAL) *by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)*	< 0.8	%	0.00 - 2.0
HAEMOGLOBIN A2 *by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)*	2.1	%	1.50 - 3.70
PEAK 3 *by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)*	4	%	< 10.0
OTHERS-NON SPECIFIC *by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)*	ABSENT	%	ABSENT
HAEMOGLOBIN S *by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)*	NOT DETECTED	%	< 0.02
HAEMOGLOBIN D (PUNJAB) *by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)*	NOT DETECTED	%	< 0.02
HAEMOGLOBIN E *by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)*	NOT DETECTED	%	< 0.02
HAEMOGLOBIN C *by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)*	NOT DETECTED	%	< 0.02
UNKNOWN UNIDENTIFIED VARIANTS *by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)*	NOT DETECTED	%	< 0.02
GLYCOSYLATED HAEMOGLOBIN (HbA1c): **WHOLE BLOOD** ***by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)***	**3.9L**	**%**	**4.0 - 6.4**
RED BLOOD CELLS (RBCS) COUNT AND INDICES			
HAEMOGLOBIN (HB) ***by AUTOMATED HEMATOLOGY ANALYZER***	**9.3L**	**gm/dL**	**12.0 - 16.0**
RED BLOOD CELL (RBC) COUNT *by AUTOMATED HEMATOLOGY ANALYZER*	4.04	Millions/cmm	3.50 - 5.00
PACKED CELL VOLUME (PCV) ***by AUTOMATED HEMATOLOGY ANALYZER***	**29.8L**	**%**	**37.0 - 50.0**
MEAN CORPUSCULAR VOLUME (MCV) ***by AUTOMATED HEMATOLOGY ANALYZER***	**73.9L**	**fL**	**80.0 - 100.0**

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Test Name	Value	Unit	Biological Reference interval
MEAN CORPUSCULAR HAEMOGLOBIN (MCH) *by AUTOMATED HEMATOLOGY ANALYZER*	**22.9^{L}**	**pg**	**27.0 - 34.0**
MEAN CORPUSCULAR HEMOGLOBIN CONC. (MCHC) *by AUTOMATED HEMATOLOGY ANALYZER*	**31^{L}**	**g/dL**	**32.0 - 36.0**
RED CELL DISTRIBUTION WIDTH (RDW-CV) *by AUTOMATED HEMATOLOGY ANALYZER*	**16.6^{H}**	**%**	**11.00 - 16.00**
RED CELL DISTRIBUTION WIDTH (RDW-SD) *by AUTOMATED HEMATOLOGY ANALYZER*	45.6	fL	35.0 - 56.0
OTHERS			
MENTZERS INDEX *by CALCULATED*	18.29	RATIO	BETA THALASSEMIA TRAIT: < 13.0 IRON DEFICIENCY ANEMIA: >13.0
INTERPRETATION	Suggestive of absence of common abnormal hemoglobinopathies.		

INTERPRETATION:

The Thalassemia syndromes, considered the most common genetic disorder worldwide, are a heterogenous group of mandelian 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 quatitation 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 istinguished 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 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.

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Test Name	Value	Unit	Biological Reference interval

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CLIENT CODE.	: KOS DIAGNOSTIC LAB	**REPORTING DATE**	: 04/Jul/2024 01:47PM
CLIENT ADDRESS	: 6349/1, NICHOLSON ROAD, AMBALA CANTT		

Test Name	Value	Unit	Biological Reference interval

ENDOCRINOLOGY

THYROID STIMULATING HORMONE (TSH)

THYROID STIMULATING HORMONE (TSH): SERUM	4.196	µIU/mL	0.35 - 5.50

by CMIA (CHEMILUMINESCENT MICROPARTICLE IMMUNOASSAY)

3rd GENERATION, ULTRASENSITIVE

INTERPRETATION:

AGE	REFFERENCE RANGE (µIU/mL)
0 – 5 DAYS	0.70 – 15.20
6 Days – 2 Months	0.70 – 11.00
3 – 11 Months	0.70 – 8.40
1 – 5 Years	0.70 – 7.00
6 – 10 Years	0.60 – 5.50
11 - 15	0.50 – 5.50
> 20 Years (Adults)	0.27 – 5.50
PREGNANCY	
1st Trimester	0.10 - 3.00
2nd Trimester	0.20 - 3.00
3rd Trimester	0.30 - 4.10

NOTE:-*TSH levels are subjected to circardian variation, reaching peak levels between 2-4 a.m and at a minimum between 6-10 pm. The variation is of the order of 50 %. Hence time of the day has influence on the measured serum TSH concentration.*

USE:- TSH controls biosynthesis and release of thyroid harmones T4 & T3. It is a sensitive measure of thyroid function, especially useful in early or subclinical hypothyroidism, before the patient develops any clinical findings or goitre or any other thyroid function abnormality.

INCREASED LEVELS:

1.Primary or untreated hypothyroidism, may vary from 3 times to more than 100 times normal depending on degree of hypofunction.
2.Hypothyroid patients receiving insufficient thyroid replacement therapy.
3.Hashimotos thyroiditis.
4.DRUGS: Amphetamines, Iodine containing agents and dopamine antagonist.
5.Neonatal period, increase in 1st 2-3 days of life due to post-natal surge.

DECREASED LEVELS:

1.Toxic multi-nodular goitre & Thyroiditis.
2.Over replacement of thyroid harmone in treatment of hypothyroidism.
3.Autonomously functioning Thyroid adenoma
4.Secondary pituatary or hypothalmic hypothyroidism
5.Acute psychiatric illness
6.Severe dehydration.

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Test Name	Value	Unit	Biological Reference interval

7.DRUGS: Glucocorticoids, Dopamine, Levodopa, T4 replacement therapy, Anti-thyroid drugs for thyrotoxicosis.
8.Pregnancy: 1st and 2nd Trimester

LIMITATIONS:

1.TSH may be normal in central hypothyroidism, recent rapid correction of hyperthyroidism or hypothyroidism, pregnancy, phenytoin therapy.
2.Autoimmune disorders may produce spurious results.

*** End Of Report ***

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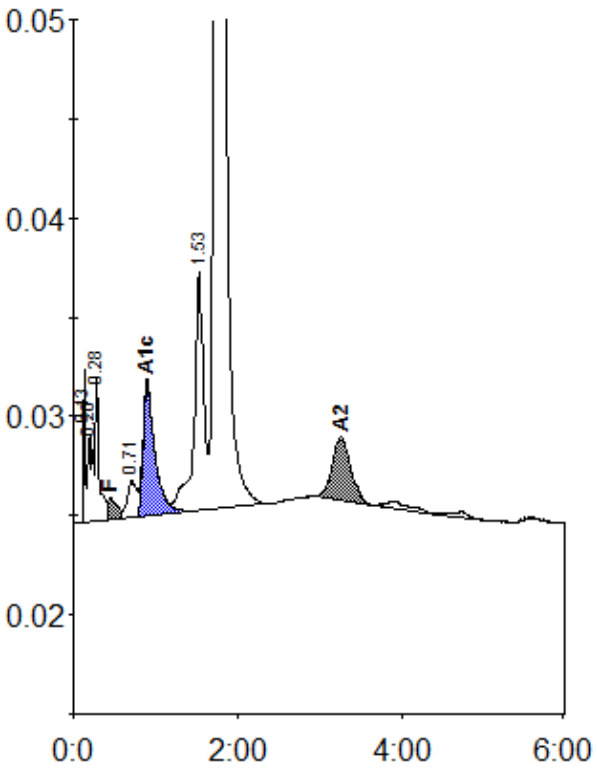
MBBS , MD (PATHOLOGY)

Patient report

Bio-Rad	DATE: 07/04/2024
D-10	TIME: 06:42 PM
S/N: #DJ6F040603	Software version: 4.30-2
Sample ID:	01512505
Injection date	07/04/2024 05:37 PM
Injection #: 1	Method: HbA2/F
Rack #: ---	Rack position: 1



Peak table - ID: 01512505

Peak	R.time	Height	Area	Area %
Unknown	0.13	7748	10229	0.4
A1a	0.20	4441	19445	0.8
A1b	0.28	7318	21761	0.9
F	0.44	1084	13297	< 0.8 *
LA1c/CHb-1	0.71	1842	14268	0.6
A1c	0.90	6765	67391	3.9
P3	1.53	12017	97316	4.0
A0	1.73	463530	2143121	87.9
A2	3.25	3192	50204	2.1
Total Area:	2437031			

Concentration:	%
F	< 0.8 *
A1c	3.9
A2	2.1