NAME	**: Mrs. ARCHANA**		
AGE/ GENDER	: 55 YRS/FEMALE	**PATIENT ID**	: 1579945
COLLECTED BY	:	**REG. NO./LAB NO.**	**: 012408130060**
REFERRED BY	: Dr. D.S.GOEL (AMBALA CANTT)	**REGISTRATION DATE**	: 13/Aug/2024 07:44 PM
BARCODE NO.	: 01515029	**COLLECTION DATE**	: 13/Aug/2024 07:47PM
CLIENT CODE.	: KOS DIAGNOSTIC LAB	**REPORTING DATE**	: 14/Aug/2024 10:17AM
CLIENT ADDRESS	: 6349/1, NICHOLSON ROAD, AMBALA CANTT		

HAEMATOLOGY

PERIPHERAL BLOOD SMEAR

TEST NAME:

PERIPHERAL BLOOD FILM/SMEAR (PBF)

RED BLOOD CELLS (RBC'S):

Anisocytosis with microcytosis.RBCs reveal mild to moderate hypochromia.No polychromatic cells or normoblasts present.

WHITE BLOOD CELLS (WBC'S):

No immature leucocytes seen.

PLATELETS:

Platelets are adequate.

HEMOPARASITES:

NOT SEEN.

IMPRESSION:

Microcytic hypochromic anemia.

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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)*	**80.2^{L}**	**%**	**83.00 - 90.00**
HAEMOGLOBIN F (FOETAL) *by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)*	0.9	%	0.00 - 2.0
HAEMOGLOBIN A2 *by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)*	**4.3^{H}**	**%**	**1.50 - 3.70**
PEAK 3 *by HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY)*	6.3	%	< 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)*	6.3	%	4.0 - 6.4
RED BLOOD CELLS (RBCS) COUNT AND INDICES			
HAEMOGLOBIN (HB) *by AUTOMATED HEMATOLOGY ANALYZER*	**8.9^{L}**	**gm/dL**	**12.0 - 16.0**
RED BLOOD CELL (RBC) COUNT *by AUTOMATED HEMATOLOGY ANALYZER*	**5.15^{H}**	**Millions/cmm**	**3.50 - 5.00**
PACKED CELL VOLUME (PCV) *by AUTOMATED HEMATOLOGY ANALYZER*	**30.7^{L}**	**%**	**37.0 - 50.0**
MEAN CORPUSCULAR VOLUME (MCV) *by AUTOMATED HEMATOLOGY ANALYZER*	**59.7^{L}**	**fL**	**80.0 - 100.0**

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Test Name	Value	Unit	Biological Reference interval
MEAN CORPUSCULAR HAEMOGLOBIN (MCH) *by AUTOMATED HEMATOLOGY ANALYZER*	**17.2^{L}**	**pg**	**27.0 - 34.0**
MEAN CORPUSCULAR HEMOGLOBIN CONC. (MCHC) *by AUTOMATED HEMATOLOGY ANALYZER*	**28.8^{L}**	**g/dL**	**32.0 - 36.0**
RED CELL DISTRIBUTION WIDTH (RDW-CV) *by AUTOMATED HEMATOLOGY ANALYZER*	**18^{H}**	**%**	**11.00 - 16.00**
RED CELL DISTRIBUTION WIDTH (RDW-SD) *by AUTOMATED HEMATOLOGY ANALYZER*	40.2	fL	35.0 - 56.0
OTHERS			
NAKED EYE SINGLE TUBE RED CELL OSMOTIC FRAGILITY TEST *by SINGLE RED CELL OSMOTIC FRAGILITY*	NEGATIVE (-ve)		NEGATIVE (-ve)
MENTZERS INDEX *by CALCULATED*	11.59	RATIO	BETA THALASSEMIA TRAIT: < 13.0 IRON DEFICIENCY ANEMIA: >13.0
INTERPRETATION	HB VARIANT ANALYSIS- Suggestive of Beta thalassemia trait. Parental screening &- or DNA analysis is advised.		

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

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Test Name	Value	Unit	Biological Reference interval

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

VITAMINS

VITAMIN B12/COBALAMIN

VITAMIN B12/COBALAMIN: SERUM	753.59	pg/mL	190.0 - 830

by CMIA (CHEMILUMINESCENT MICROPARTICLE IMMUNOASSAY)

INTERPRETATION:-

INCREASED VITAMIN B12	DECREASED VITAMIN B12
1.Ingestion of Vitamin C	1.Pregnancy
2.Ingestion of Estrogen	2.DRUGS:Aspirin, Anti-convulsants, Colchicine
3.Ingestion of Vitamin A	3.Ethanol Igestion
4.Hepatocellular injury	4. Contraceptive Harmones
5.Myeloproliferative disorder	5.Haemodialysis
6.Uremia	6. Multiple Myeloma

1.Vitamin B12 (cobalamin) is necessary for hematopoiesis and normal neuronal function.
2.In humans, it is obtained only from animal proteins and requires intrinsic factor (IF) for absorption.
3.The body uses its vitamin B12 stores very economically, reabsorbing vitamin B12 from the ileum and returning it to the liver; very little is excreted.
4.Vitamin B12 deficiency may be due to lack of IF secretion by gastric mucosa (eg, gastrectomy, gastric atrophy) or intestinal malabsorption (eg, ileal resection, small intestinal diseases).
5.Vitamin B12 deficiency frequently causes macrocytic anemia, glossitis, peripheral neuropathy, weakness, hyperreflexia, ataxia, loss of proprioception, poor coordination, and affective behavioral changes. These manifestations may occur in any combination; many patients have the neurologic defects without macrocytic anemia.
6.Serum methylmalonic acid and homocysteine levels are also elevated in vitamin B12 deficiency states.
7.Follow-up testing for antibodies to intrinsic factor (IF) is recommended to identify this potential cause of vitamin B12 malabsorption.
NOTE:A normal serum concentration of vitamin B12 does not rule out tissue deficiency of vitamin B12. The most sensitive test for vitamin B12 deficiency at the cellular level is the assay for MMA. If clinical symptoms suggest deficiency, measurement of MMA and homocysteine should be considered, even if serum vitamin B12 concentrations are normal.

*** End Of Report ***

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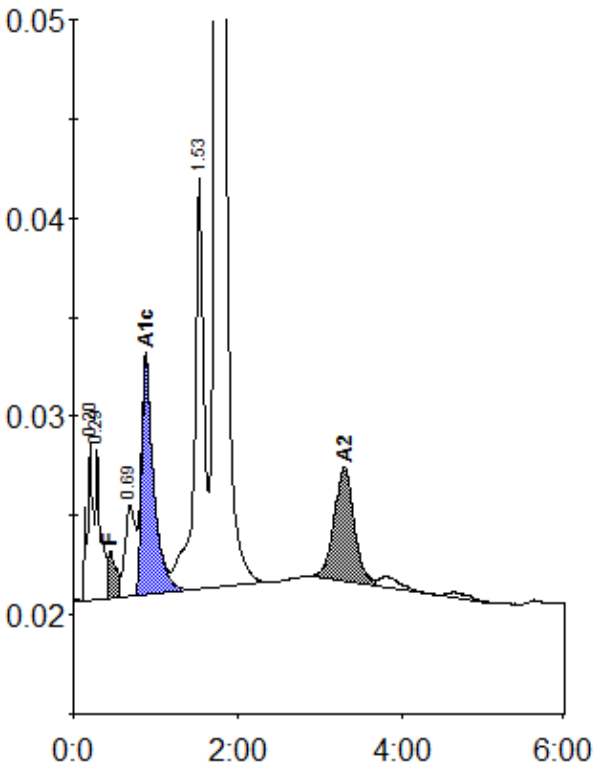
Patient report

Bio-Rad	DATE: 08/13/2024
D-10	TIME: 06:00 PM
S/N: #DJ6F040603	Software version: 4.30-2
Sample ID:	01515029
Injection date	08/13/2024 05:52 PM
Injection #: 13	Method: HbA2/F
Rack #: ---	Rack position: 1



Peak table - ID: 01515029

Peak	R.time	Height	Area	Area %
A1a	0.20	8094	41193	1.6
A1b	0.29	7700	31843	1.2
F	0.45	2423	23848	0.9
LA1c/CHb-1	0.69	4607	40374	1.5
A1c	0.88	11997	122932	6.3
P3	1.53	20904	165130	6.3
A0	1.74	451961	2109658	80.2
A2	3.30	5750	96876	4.3
Total Area:	2631854			

Concentration:	%
F	0.9
A1c	6.3
A2	4.3