

PATIENT NAME : MOHIT GOKHALE

REF. DOCTOR : SELF

CODE/NAME & ADDRESS : C000101325

FPSC RELIEF DIAGNOSTIC CENTRE KANDIVALI
SHOP NO. 17, BLOCK C, VICEROY COURT, CHSL,
THAKUR VILLAGE, KANDIVALI(EAST),
MUMBAI 400101
9867964796

ACCESSION NO : 0002WI033389

PATIENT ID : MOHIM799495530

CLIENT PATIENT ID:

ABHA NO :

AGE/SEX : 19 Years Male

DRAWN : 22/09/2023 10:05:24

RECEIVED : 22/09/2023 13:01:55

REPORTED : 22/09/2023 17:42:24

Test Report Status Final

Results

Biological Reference Interval Units

HAEMATOLOGY - CBC**COMPLETE CARE TOTAL WITH SMART REPORT****BLOOD COUNTS,EDTA WHOLE BLOOD**

HEMOGLOBIN (HB)	16.5	13.0 - 17.0	g/dL
METHOD : CYANIDE FREE DETERMINATION			
RED BLOOD CELL (RBC) COUNT	5.43	4.5 - 5.5	mil/ μ L
METHOD : FLUORESCENCE FLOW CYTOMETRY			
WHITE BLOOD CELL (WBC) COUNT	7.56	4.0 - 10.0	thou/ μ L
METHOD : ELECTRICAL IMPEDANCE			
PLATELET COUNT	312	150 - 410	thou/ μ L
METHOD : ELECTRONIC IMPEDENCE & MICROSCOPY			

RBC AND PLATELET INDICES

HEMATOCRIT (PCV)	50.0	40 - 50	%
METHOD : CALCULATED PARAMETER			
MEAN CORPUSCULAR VOLUME (MCV)	92.1	83.0 - 101.0	fL
METHOD : DERIVED PARAMETER FROM RBC HISTOGRAM			
MEAN CORPUSCULAR HEMOGLOBIN (MCH)	30.5	27.0 - 32.0	pg
METHOD : CALCULATED PARAMETER			
MEAN CORPUSCULAR HEMOGLOBIN CONCENTRATION (MCHC)	33.1	31.5 - 34.5	g/dL
METHOD : CALCULATED PARAMETER			
RED CELL DISTRIBUTION WIDTH (RDW)	13.2	11.6 - 14.0	%
METHOD : DERIVED PARAMETER FROM RBC HISTOGRAM			
MENTZER INDEX	17.0		
MEAN PLATELET VOLUME (MPV)	9.8	6.8 - 10.9	fL
METHOD : DERIVED PARAMETER FROM PLATELET HISTOGRAM			

WBC DIFFERENTIAL COUNT

NEUTROPHILS	57	40 - 80	%
METHOD : FLUORESCENCE FLOW CYTOMETRY			
LYMPHOCYTES	29	20 - 40	%
METHOD : FLUORESCENCE FLOW CYTOMETRY			
MONOCYTES	6	2 - 10	%
METHOD : FLUORESCENCE FLOW CYTOMETRY			
EOSINOPHILS	8 High	1 - 6	%
METHOD : FLUORESCENCE FLOW CYTOMETRY			



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BASOPHILS	0	0 - 1	%	
METHOD : FLUORESCENCE FLOW CYTOMETRY				
ABSOLUTE NEUTROPHIL COUNT	4.31	2.0 - 7.0	thou/ μ L	
METHOD : CALCULATED PARAMETER				
ABSOLUTE LYMPHOCYTE COUNT	2.21	1.0 - 3.0	thou/ μ L	
METHOD : CALCULATED PARAMETER				
ABSOLUTE MONOCYTE COUNT	0.45	0.2 - 1.0	thou/ μ L	
METHOD : CALCULATED PARAMETER				
ABSOLUTE EOSINOPHIL COUNT	0.57 High	0.02 - 0.50	thou/ μ L	
METHOD : CALCULATED PARAMETER				
ABSOLUTE BASOPHIL COUNT	0 Low	0.02 - 0.10	thou/ μ L	
METHOD : CALCULATED PARAMETER				
NEUTROPHIL LYMPHOCYTE RATIO (NLR)	2.0			
METHOD : CALCULATED				
PERIPHERAL SMEAR EXAM, EDTA WHOLE BLOOD				
RBC	PREDOMINANTLY NORMOCYTIC NORMOCHROMIC			
WBC	NORMAL MORPHOLOGY			
PLATELETS	ADEQUATE			

Interpretation(s)

BLOOD COUNTS,EDTA WHOLE BLOOD-The cell morphology is well preserved for 24hrs. However after 24-48 hrs a progressive increase in MCV and HCT is observed leading to a decrease in MCHC. A direct smear is recommended for an accurate differential count and for examination of RBC morphology.

RBC AND PLATELET INDICES-Mentzer index (MCV/RBC) is an automated cell-counter based calculated screen tool to differentiate cases of Iron deficiency anaemia(>13) from Beta thalassaemia trait

(<13) in patients with microcytic anaemia. This needs to be interpreted in line with clinical correlation and suspicion. Estimation of HbA2 remains the gold standard for diagnosing a case of beta thalassaemia trait.

WBC DIFFERENTIAL COUNT-The optimal threshold of 3.3 for NLR showed a prognostic possibility of clinical symptoms to change from mild to severe in COVID positive patients. When age = 49.5 years old and NLR = 3.3, 46.1% COVID-19 patients with mild disease might become severe. By contrast, when age < 49.5 years old and NLR < 3.3, COVID-19 patients tend to show mild disease.

(Reference to - The diagnostic and predictive role of NLR, d-NLR and PLR in COVID-19 patients A.-P. Yang, et al. International Immunopharmacology 84 (2020) 106504 This ratio element is calculated parameter and out of NABL scope.



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Test Report Status**Final****Results****Biological Reference Interval****Units****HAEMATOLOGY****COMPLETE CARE TOTAL WITH SMART REPORT****ERYTHROCYTE SEDIMENTATION RATE (ESR), WHOLE BLOOD**

E.S.R 10 0 - 14 mm at 1 hr

METHOD : AUTOMATED (PHOTOMETRICAL CAPILLARY STOPPED FLOW KINETIC ANALYSIS)

GLYCOSYLATED HEMOGLOBIN(HBAlC), EDTA WHOLE BLOOD

HbAlC	5.2	Non-diabetic Adult < 5.7 %
		Pre-diabetes 5.7 - 6.4
		Diabetes diagnosis: > or = 6.5
		Therapeutic goals: < 7.0
		Action suggested : > 8.0 (ADA Guideline 2021)

METHOD : ION- EXCHANGE HPLC

ESTIMATED AVERAGE GLUCOSE(EAG) 102.5 < 116 mg/dL

Interpretation(s)**ERYTHROCYTE SEDIMENTATION RATE (ESR), WHOLE BLOOD-TEST DESCRIPTION :-**

Erythrocyte sedimentation rate (ESR) is a test that indirectly measures the degree of inflammation present in the body. The test actually measures the rate of fall (sedimentation) of erythrocytes in a sample of blood that has been placed into a tall, thin, vertical tube. Results are reported as the millimetres of clear fluid (plasma) that are present at the top portion of the tube after one hour. Nowadays fully automated instruments are available to measure ESR.

ESR is not diagnostic it is a non-specific test that may be elevated in a number of different conditions. It provides general information about the presence of an inflammatory condition.CRP is superior to ESR because it is more sensitive and reflects a more rapid change.

TEST INTERPRETATION

Increase in: Infections, Vasculitis, Inflammatory arthritis, Renal disease, Anemia, Malignancies and plasma cell dyscrasias, Acute allergy Tissue injury, Pregnancy, Estrogen medication, Aging.

Finding a very accelerated ESR(>100 mm/hour) in patients with ill-defined symptoms directs the physician to search for a systemic disease (Paraproteinemias, Disseminated malignancies, connective tissue disease, severe infections such as bacterial endocarditis).

In pregnancy BRI in first trimester is 0-48 mm/hr(62 if anemic) and in second trimester (0-70 mm /hr(95 if anemic). ESR returns to normal 4th week post partum.

Decreased in: Polycythermia vera, Sickle cell anemia

LIMITATIONS

False elevated ESR : Increased fibrinogen, Drugs(Vitamin A, Dextran etc), Hypercholesterolemia

False Decreased : Poikilocytosis,(SickleCells,spherocytes),Microcytosis, Low fibrinogen, Very high WBC counts, Drugs(Quinine, salicylates)

REFERENCE :

1. Nathan and Oski's Haematology of Infancy and Childhood, 5th edition 2. Paediatric reference intervals. AACC Press, 7th edition. Edited by S. Soldin 3. The reference for the adult reference range is "Practical Haematology by Dacie and Lewis,10th edition.

GLYCOSYLATED HEMOGLOBIN(HBAlC), EDTA WHOLE BLOOD-Used For:

1. Evaluating the long-term control of blood glucose concentrations in diabetic patients.
2. Diagnosing diabetes.
3. Identifying patients at increased risk for diabetes (prediabetes).



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The ADA recommends measurement of HbA1c (typically 3-4 times per year for type 1 and poorly controlled type 2 diabetic patients, and 2 times per year for well-controlled type 2 diabetic patients) to determine whether a patient's metabolic control has remained continuously within the target range.

1. eAG (Estimated average glucose) converts percentage HbA1c to mg/dl, to compare blood glucose levels.
2. eAG gives an evaluation of blood glucose levels for the last couple of months.
3. eAG is calculated as eAG (mg/dl) = 28.7 * HbA1c - 46.7

HbA1c Estimation can get affected due to :

1. Shortened Erythrocyte survival : Any condition that shortens erythrocyte survival or decreases mean erythrocyte age (e.g. recovery from acute blood loss, hemolytic anemia) will falsely lower HbA1c test results. Fructosamine is recommended in these patients which indicates diabetes control over 15 days.
2. Vitamin C & E are reported to falsely lower test results. (possibly by inhibiting glycation of hemoglobin).
3. Iron deficiency anemia is reported to increase test results. Hypertriglyceridemia, uremia, hyperbilirubinemia, chronic alcoholism, chronic ingestion of salicylates & opiates addiction are reported to interfere with some assay methods, falsely increasing results.
4. Interference of hemoglobinopathies in HbA1c estimation is seen in

a) Homozygous hemoglobinopathy. Fructosamine is recommended for testing of HbA1c.

b) Heterozygous state detected (D10 is corrected for HbS & HbC trait.)

c) HbF > 25% on alternate platform (Boronate affinity chromatography) is recommended for testing of HbA1c. Abnormal Hemoglobin electrophoresis (HPLC method) is recommended for detecting a hemoglobinopathy



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FBS (FASTING BLOOD SUGAR)	90	Normal <100 Impaired fasting glucose: 100 to 125 Diabetes mellitus: > = 126 (on more than 1 occasion) (ADA guidelines 2021)	mg/dL
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METHOD : SPECTROPHOTOMETRY HEXOKINASE

LIVER FUNCTION PROFILE, SERUM

BILIRUBIN, TOTAL	0.47	Upto 1.2	mg/dL
METHOD : SPECTROPHOTOMETRY, COLORIMETRIC -DIAZO METHOD			
BILIRUBIN, DIRECT	0.20	< or = 0.3	mg/dL
METHOD : SPECTROPHOTOMETRY, JENDRASSIK & GROFF - DIAZOTIZATION			
BILIRUBIN, INDIRECT	0.27	0.0 - 0.9	mg/dL
METHOD : CALCULATED PARAMETER			
TOTAL PROTEIN	7.7	6.0 - 8.0	g/dL
METHOD : SPECTROPHOTOMETRY, COLORIMETRIC -BIURET, REAGENT BLANK, SERUM BLANK			
ALBUMIN	5.1 High	3.97 - 4.94	g/dL
METHOD : SPECTROPHOTOMETRY, BROMOCRESOL GREEN(BCG) - DYE BINDING			
GLOBULIN	2.6	2.0 - 3.5	g/dL
METHOD : CALCULATED PARAMETER			
ALBUMIN/GLOBULIN RATIO	2.0	1.0 - 2.1	RATIO
METHOD : CALCULATED PARAMETER			
ASPARTATE AMINOTRANSFERASE(AST/SGOT)	25	Upto 40	U/L
METHOD : SPECTROPHOTOMETRY, WITHOUT PYRIDOXAL PHOSPHATE ACTIVATION(P5P) - IFCC			
ALANINE AMINOTRANSFERASE (ALT/SGPT)	40	Upto 41	U/L
METHOD : SPECTROPHOTOMETRY, WITHOUT PYRIDOXAL PHOSPHATE ACTIVATION(P5P) - IFCC			
ALKALINE PHOSPHATASE	118	55 - 149	U/L
METHOD : SPECTROPHOTOMETRY, PNPP, AMP BUFFER - IFCC			
GAMMA GLUTAMYL TRANSFERASE (GGT)	26	< 60	U/L
METHOD : SPECTROPHOTOMETRY, ENZYMATIC COLORIMETRIC - G-GLUTAMYL-CARBOXY-NITROANILIDE - IFCC			
LACTATE DEHYDROGENASE	145	< 232	U/L
METHOD : SPECTROPHOTOMETRY, LACTATE TO PYRUVATE - UV-IFCC			

LIPID PROFILE, SERUM

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CHOLESTEROL, TOTAL	229 High	Desirable : < 200 Borderline : 200 - 239 High : > / = 240	mg/dL
METHOD : SPECTROPHOTOMETRY, ENZYMATIC COLORIMETRIC - CHOLESTEROL OXIDASE, ESTERASE, PEROXIDASE			
TRIGLYCERIDES	131	Normal: < 150 Borderline high: 150 - 199 High: 200 - 499 Very High: >/= 500	mg/dL
METHOD : SPECTROPHOTOMETRY, ENZYMATIC ENDPOINT WITH GLYCEROL BLANK			
HDL CHOLESTEROL	42	At Risk: < 40 Desirable: > or = 60	mg/dL
METHOD : SPECTROPHOTOMETRY, HOMOGENEOUS DIRECT ENZYMATIC COLORIMETRIC			
CHOLESTEROL LDL	161 High	Optimal : < 100 Near optimal/above optimal : 100-129 Borderline high : 130-159 High : 160-189 Very high : = 190	mg/dL
METHOD : CALCULATED PARAMETER			
NON HDL CHOLESTEROL	187 High	Desirable : < 130 Above Desirable : 130 -159 Borderline High : 160 - 189 High : 190 - 219 Very high : > / = 220	mg/dL
METHOD : CALCULATED PARAMETER			
VERY LOW DENSITY LIPOPROTEIN	26.0	< or = 30.0	mg/dL
METHOD : CALCULATED PARAMETER			
CHOL/HDL RATIO	5.5 High	Low Risk : 3.3 - 4.4 Average Risk : 4.5 - 7.0 Moderate Risk : 7.1 - 11.0 High Risk : > 11.0	
METHOD : CALCULATED PARAMETER			
LDL/HDL RATIO	4.1 High	Desirable/Low Risk : 0.5 - 3.0 Borderline/Moderate Risk : 3.1 - 6.0 High Risk : > 6.0	
METHOD : CALCULATED PARAMETER			

Interpretation(s)

Serum lipid profile is measured for cardiovascular risk prediction. Lipid Association of India recommends LDL-C as primary target and Non



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HDL-C as co-primary treatment target.

Risk Stratification for ASCVD (Atherosclerotic cardiovascular disease) by Lipid Association of India

Risk Category	
Extreme risk group	A.CAD with > 1 feature of high risk group
	B. CAD with > 1 feature of Very high risk group or recurrent ACS (within 1 year) despite LDL-C < or = 50 mg/dl or polyvascular disease
Very High Risk	1. Established ASCVD 2. Diabetes with 2 major risk factors or evidence of end organ damage 3. Familial Homozygous Hypercholesterolemia
High Risk	1. Three major ASCVD risk factors. 2. Diabetes with 1 major risk factor or no evidence of end organ damage. 3. CKD stage 3B or 4. 4. LDL >190 mg/dl 5. Extreme of a single risk factor. 6. Coronary Artery Calcium - CAC >300 AU. 7. Lipoprotein a >/= 50mg/dl 8. Non stenotic carotid plaque
Moderate Risk	2 major ASCVD risk factors
Low Risk	0-1 major ASCVD risk factors

Major ASCVD (Atherosclerotic cardiovascular disease) Risk Factors

- | | |
|--|---|
| 1. Age > or = 45 years in males and > or = 55 years in females | 3. Current Cigarette smoking or tobacco use |
| 2. Family history of premature ASCVD | 4. High blood pressure |
| 5. Low HDL | |

Newer treatment goals and statin initiation thresholds based on the risk categories proposed by LAI in 2020.

Risk Group	Treatment Goals		Consider Drug Therapy	
	LDL-C (mg/dl)	Non-HDL (mg/dl)	LDL-C (mg/dl)	Non-HDL (mg/dl)
Extreme Risk Group Category A	<50 (Optional goal < OR = 30)	< 80 (Optional goal <OR = 60)	>OR = 50	>OR = 80
Extreme Risk Group Category B	<OR = 30	<OR = 60	> 30	>60
Very High Risk	<50	<80	>OR= 50	>OR= 80
High Risk	<70	<100	>OR= 70	>OR= 100
Moderate Risk	<100	<130	>OR= 100	>OR= 130
Low Risk	<100	<130	>OR= 130*	>OR= 160

*After an adequate non-pharmacological intervention for at least 3 months.

References: Management of Dyslipidaemia for the Prevention of Stroke: Clinical Practice Recommendations from the Lipid Association of India. Current Vascular Pharmacology, 2022, 20, 134-155.

KIDNEY FUNCTION TEST

BLOOD UREA NITROGEN 13 mg/dL

METHOD : SPECTROPHOTOMETRY, UREASE -COLORIMETRIC

CREATININE 0.95 mg/dL

METHOD : SPECTROPHOTOMETRY, JAFFE'S ALKALINE PICRATE KINETIC - RATE BLANKED - IFCC-IDMS STANDARDIZED

BUN/CREAT RATIO 13.68 8 - 15

METHOD : CALCULATED PARAMETER

URIC ACID 6.7 mg/dL

METHOD : SPECTROPHOTOMETRY, ENZYMATIC COLORIMETRIC- URICASE

TOTAL PROTEIN 7.7 g/dL

METHOD : SPECTROPHOTOMETRY, COLORIMETRIC -BIURET, REAGENT BLANK, SERUM BLANK



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ALBUMIN		5.1 High	3.97 - 4.94	g/dL
		METHOD : SPECTROPHOTOMETRY, BROMOCRESOL GREEN(BCG) - DYE BINDING		
GLOBULIN		2.6	2.0 - 3.5	g/dL
		METHOD : CALCULATED PARAMETER		
CALCIUM		10.4 High	8.6 - 10.0	mg/dL
		METHOD : SPECTROPHOTOMETRY, NM - BAPTA		
SODIUM, SERUM		139	136 - 145	mmol/L
		METHOD : ISE INDIRECT		
POTASSIUM, SERUM		4.70	3.5 - 5.1	mmol/L
		METHOD : ISE INDIRECT		
CHLORIDE, SERUM		101	98 - 106	mmol/L
		METHOD : ISE INDIRECT		

Comments

NOTE : RECHECKED FOR SERUM CALCIUM.

MAGNESIUM, SERUM

MAGNESIUM, SERUM	2.3 High	1.7 - 2.2	mg/dL
METHOD : SPECTROPHOTOMETRY, COLORIMETRIC ENDPOINT - XYLIDYL BLUE			

Interpretation(s)**GLUCOSE FASTING,FLUORIDE PLASMA-TEST DESCRIPTION**

Normally, the glucose concentration in extracellular fluid is closely regulated so that a source of energy is readily available to tissues and so that no glucose is excreted in the urine.

Increased in: Diabetes mellitus, Cushing's syndrome (10 – 15%), chronic pancreatitis (30%). Drugs:corticosteroids,phenytoin, estrogen, thiazides.**Decreased in:** Pancreatic islet cell disease with increased insulin,insulinoma,adrenocortical insufficiency,hypopituitarism,diffuse liver disease, malignancy(adrenocortical,stomach,fibrosarcoma),infant of a diabetic mother,enzyme deficiency diseases(e.g.galactosemia),Drugs-insulin,ethanol,propranolol,sulfonylureas,tolbutamide, and other oral hypoglycemic agents.**NOTE:** While random serum glucose levels correlate with home glucose monitoring results (weekly mean capillary glucose values),there is wide fluctuation within individuals.Thus, glycosylated hemoglobin(HbA1c) levels are favored to monitor glycemic control.

High fasting glucose level in comparison to post prandial glucose level may be seen due to effect of Oral Hypoglycaemics & Insulin treatment,Renal Glycosuria,Glycaemic index & response to food consumed,Alimentary Hypoglycemia,Increased insulin response & sensitivity etc.

LIVER FUNCTION PROFILE, SERUM-

Bilirubin is a yellowish pigment found in bile and is a breakdown product of normal heme catabolism. Bilirubin is excreted in bile and urine, and elevated levels may give yellow discoloration in jaundice.**Elevated levels** results from increased bilirubin production (eg, hemolysis and ineffective erythropoiesis), decreased bilirubin excretion (eg, obstruction and hepatitis), and abnormal bilirubin metabolism (eg, hereditary and neonatal jaundice). Conjugated (direct) bilirubin is elevated more than unconjugated (indirect) bilirubin in Viral hepatitis, Drug reactions, Alcoholic liver disease Conjugated (direct) bilirubin is also elevated more than unconjugated (indirect) bilirubin when there is some kind of blockage of the bile ducts like in Gallstones getting into the bile ducts, tumors & Scarring of the bile ducts. Increased unconjugated (indirect) bilirubin may be a result of Hemolytic or pernicious anemia, Transfusion reaction & a common metabolic condition termed Gilbert syndrome, due to low levels of the enzyme that attaches sugar molecules to bilirubin.

AST is an enzyme found in various parts of the body. AST is found in the liver, heart, skeletal muscle, kidneys, brain, and red blood cells, and it is commonly measured clinically as a marker for liver health. AST levels increase during chronic viral hepatitis, blockage of the bile duct, cirrhosis of the liver,liver cancer,kidney failure,hemolytic anemia,pancreatitis,hemochromatosis. AST levels may also increase after a heart attack or strenuous activity.**ALT** test measures the amount of this enzyme in the blood.**ALT** is found mainly in the liver, but also in smaller amounts in the kidneys,heart,muscles, and pancreas.It is commonly measured as a part of a diagnostic evaluation of hepatocellular injury, to determine liver health.**AST** levels increase during acute hepatitis,sometimes due to a viral infection,ischemia to the liver,chronic hepatitis,obstruction of bile ducts,cirrhosis.

ALP is a protein found in almost all body tissues.Tissues with higher amounts of ALP include the liver,bile ducts and bone.Elevated ALP levels are seen in Biliary obstruction, Osteoblastic bone tumors, osteomalacia, hepatitis, Hyperparathyroidism, Leukemia, Lymphoma, Pagets disease,Rickets,Sarcoidosis etc. Lower-than-normal ALP levels seen



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ACCESSION NO : 0002WI033389**PATIENT ID :** MOHIM799495530**CLIENT PATIENT ID:****ABHA NO :****AGE/SEX :** 19 Years Male**DRAWN :** 22/09/2023 10:05:24**RECEIVED :** 22/09/2023 13:01:55**REPORTED :** 22/09/2023 17:42:24**Test Report Status****Final****Results****Biological Reference Interval****Units**

in Hypophosphatasia,Malnutrition,Protein deficiency,Wilsons disease.

GGT is an enzyme found in cell membranes of many tissues mainly in the liver,kidney and pancreas.It is also found in other tissues including intestine,spleen,heart, brain and seminal vesicles.The highest concentration is in the kidney, but the liver is considered the source of normal enzyme activity.Serum GGT has been widely used as an index of liver dysfunction.Elevated serum GGT activity can be found in diseases of the liver,biliary system and pancreas.Conditions that increase serum GGT are obstructive liver disease,high alcohol consumption and use of enzyme-inducing drugs etc.

Total Protein also known as total protein,is a biochemical test for measuring the total amount of protein in serum.Protein in the plasma is made up of albumin and globulin.Higher-than-normal levels may be due to:Chronic inflammation or infection,including HIV and hepatitis B or C,Multiple myeloma,Waldenstroms disease.Lower-than-normal levels may be due to: Agammaglobulinemia,Bleeding (hemorrhage),Burns,Glomerulonephritis,Liver disease, Malabsorption,Malnutrition,Nephrotic syndrome,Protein-losing enteropathy etc.

Albumin is the most abundant protein in human blood plasma.It is produced in the liver.Albumin constitutes about half of the blood serum protein.Low blood albumin levels (hypoalbuminemia) can be caused by:Liver disease like cirrhosis of the liver, nephrotic syndrome,protein-losing enteropathy,Burns,hemodilution,increased vascular permeability or decreased lymphatic clearance,malnutrition and wasting etc

MAGNESIUM, SERUM-Description- Magnesium is primarily an intracellular ion associated with GI absorption and renal excretion. Second most abundant ion in bone.It functions as co-factor in numerous enzymes e.g. ATPase . 65-70% of Mg is in ionized state and nearly 35% is protein bound.

Interpretation-

Increased in- Dehydration, Tissue trauma, Renal failure, Hypothyroidism, excessive intake of antacid.
Decrease in- Chronic diarrhea, Enteric fistula, Starvation, Chronic alcoholism, Total parenteral Nutrition, Diuretics.

Note- Hypomagnesemia is associated with weakness, tetany, disorientation and somnolence

Limitation-

- Hemolysis yields elevated levels of Mg being an intracellular ion.
- Serum magnesium levels may remain normal even when total body stores of magnesium are depleted upto 20%



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Test Report Status Final**Results****Biological Reference Interval Units****SPECIALISED CHEMISTRY - ANEMIA****COMPLETE CARE TOTAL WITH SMART REPORT****SERUM IRON AND TIBC STUDIES**

IRON	87	59 - 158	µg/dL
METHOD : SPECTROPHOTOMETRY , COLORIMETRIC, FERROZINE METHOD WITHOUT DEPROTEINIZATION.			
TOTAL IRON BINDING CAPACITY	379	250 - 400	µg/dL
METHOD : CALCULATED PARAMETER			

% SATURATION

23

20 - 50

%

METHOD : CALCULATED PARAMETER

Interpretation(s)

SERUM IRON AND TIBC STUDIES-Total iron binding capacity (TIBC) measures the blood's capacity to bind iron with transferrin and thus is an indirect way of assessing transferrin level.

Taken together with serum iron and percent transferrin saturation this test is performed when there is a concern about anemia, iron deficiency or iron deficiency anemia. However, because the liver produces transferrin, alterations in liver function (such as cirrhosis, hepatitis, or liver failure) must be considered when performing this test.

Increased in:

- iron deficiency
- acute and chronic blood loss
- acute liver damage
- progesterone birth control pills

Decreased in:

- hemochromatosis
- cirrhosis of the liver
- thalassemia
- anemias of infection and chronic diseases
- nephrosis
- hyperthyroidism

The percent Transferrin saturation = Serum Iron/TIBC × 100

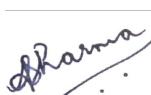
Unsaturated Binding Capacity (UIBC)=TIBC - Serum Iron.

Limitations: Estrogens and oral contraceptives increase TIBC and Asparaginase, chloramphenicol, corticotropin, cortisone and testosterone decrease the TIBC level.

Reference:

1.Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, edited by Carl A Burtis, Edward R.Ashwood, David E Bruns, 4th Edition, Elsevier publication, 2006, 563, 1314-1315.

2. Wallach's Interpretation of Diagnostic tests, 9th Edition, Ed Mary A Williamson and L Michael Snyder. Pub Lippincott Williams and Wilkins, 2011, 234-235.



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COLOR	YELLOW
APPEARANCE	CLEAR

CHEMICAL EXAMINATION, URINE

PH	6.5	5.00 - 7.50
SPECIFIC GRAVITY	1.025	1.010 - 1.030
PROTEIN	NOT DETECTED	NOT DETECTED
GLUCOSE	NOT DETECTED	NOT DETECTED
KETONES	NOT DETECTED	NOT DETECTED
BLOOD	NOT DETECTED	NOT DETECTED
BILIRUBIN	NOT DETECTED	NOT DETECTED
UROBILINOGEN	NOT DETECTED	
NITRITE	NOT DETECTED	NOT DETECTED
LEUKOCYTE ESTERASE	NOT DETECTED	NOT DETECTED

MICROSCOPIC EXAMINATION, URINE

RED BLOOD CELLS	NOT DETECTED	NOT DETECTED	/HPF
PUS CELL (WBC'S)	0-1	0-5	/HPF
EPITHELIAL CELLS	0-1	0-5	/HPF
CASTS	NOT DETECTED		
CRYSTALS	NOT DETECTED		
BACTERIA	NOT DETECTED	NOT DETECTED	
YEAST	NOT DETECTED	NOT DETECTED	

METHOD : URINE ROUTINE & MICROSCOPY EXAMINATION BY INTEGRATED AUTOMATED SYSTEM

Interpretation(s)

The following table describes the probable conditions, in which the analytes are present in urine

Presence of	Conditions
Proteins	Inflammation or immune illnesses
Pus (White Blood Cells)	Urinary tract infection, urinary tract or kidney stone, tumors or any kind of kidney impairment



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Glucose	Diabetes or kidney disease
Ketones	Diabetic ketoacidosis (DKA), starvation or thirst
Urobilinogen	Liver disease such as hepatitis or cirrhosis
Blood	Renal or genital disorders/trauma
Bilirubin	Liver disease
Erythrocytes	Urological diseases (e.g. kidney and bladder cancer, urolithiasis), urinary tract infection and glomerular diseases
Leukocytes	Urinary tract infection, glomerulonephritis, interstitial nephritis either acute or chronic, polycystic kidney disease, urolithiasis, contamination by genital secretions
Epithelial cells	Urolithiasis, bladder carcinoma or hydronephrosis, ureteric stents or bladder catheters for prolonged periods of time
Granular Casts	Low intratubular pH, high urine osmolality and sodium concentration, interaction with Bence-Jones protein
Hyaline casts	Physical stress, fever, dehydration, acute congestive heart failure, renal diseases
Calcium oxalate	Metabolic stone disease, primary or secondary hyperoxaluria, intravenous infusion of large doses of vitamin C, the use of vasodilator naftidrofuryl oxalate or the gastrointestinal lipase inhibitor orlistat, ingestion of ethylene glycol or of star fruit (<i>Averrhoa carambola</i>) or its juice
Uric acid	arthritis
Bacteria	Urinary infection when present in significant numbers & with pus cells.
Trichomonas vaginalis	Vaginitis, cervicitis or salpingitis

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SPECIALISED CHEMISTRY - HORMONE**COMPLETE CARE TOTAL WITH SMART REPORT****THYROID PANEL, SERUM**

T3	130.0	91.0 - 218.0	ng/dL
METHOD : COMPETITIVE ELECTROCHEMILUMINESCENCE IMMUNOASSAY			
T4	9.51	5.91 - 13.20	µg/dL
METHOD : COMPETITIVE ELECTROCHEMILUMINESCENCE IMMUNOASSAY			
TSH (ULTRASENSITIVE)	1.340	0.510 - 4.300	µIU/mL
METHOD : SANDWICH ELECTROCHEMILUMINESCENCE IMMUNOASSAY			

Interpretation(s)

Triiodothyronine T3 , Thyroxine T4, and Thyroid Stimulating Hormone TSH are thyroid hormones which affect almost every physiological process in the body, including growth, development, metabolism, body temperature, and heart rate.

Production of T3 and its prohormone thyroxine (T4) is activated by thyroid-stimulating hormone (TSH), which is released from the pituitary gland. Elevated concentrations of T3, and T4 in the blood inhibit the production of TSH.

Excessive secretion of thyroxine in the body is hyperthyroidism, and deficient secretion is called hypothyroidism.

In primary hypothyroidism, TSH levels are significantly elevated, while in secondary and tertiary hyperthyroidism, TSH levels are low.

Below mentioned are the guidelines for Pregnancy related reference ranges for Total T4, TSH & Total T3. Measurement of the serum TT3 level is a more sensitive test for the diagnosis of hyperthyroidism, and measurement of TT4 is more useful in the diagnosis of hypothyroidism. Most of the thyroid hormone in blood is bound to transport proteins. Only a very small fraction of the circulating hormone is free and biologically active. It is advisable to detect Free T3, FreeT4 along with TSH, instead of testing for albumin bound Total T3, Total T4.

Sr. No.	TSH	Total T4	FT4	Total T3	Possible Conditions
1	High	Low	Low	Low	(1) Primary Hypothyroidism (2) Chronic autoimmune Thyroiditis (3) Post Thyroidectomy (4) Post Radio-Iodine treatment
2	High	Normal	Normal	Normal	(1) Subclinical Hypothyroidism (2) Patient with insufficient thyroid hormone replacement therapy (3) In cases of Autoimmune/Hashimoto thyroiditis (4). Isolated increase in TSH levels can be due to Subclinical inflammation, drugs like amphetamines, Iodine containing drug and dopamine antagonist e.g. domperidone and other physiological reasons.
3	Normal/Low	Low	Low	Low	(1) Secondary and Tertiary Hypothyroidism
4	Low	High	High	High	(1) Primary Hyperthyroidism (Graves Disease) (2) Multinodular Goitre (3) Toxic Nodular Goitre (4) Thyroiditis (5) Over treatment of thyroid hormone (6) Drug effect e.g. Glucocorticoids, dopamine, T4 replacement therapy (7) First trimester of Pregnancy
5	Low	Normal	Normal	Normal	(1) Subclinical Hyperthyroidism
6	High	High	High	High	(1) TSH secreting pituitary adenoma (2) TRH secreting tumor
7	Low	Low	Low	Low	(1) Central Hypothyroidism (2) Euthyroid sick syndrome (3) Recent treatment for Hyperthyroidism



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8	Normal/Low	Normal	Normal	High	(1) T3 thyrotoxicosis (2) Non-Thyroidal illness
9	Low	High	High	Normal	(1) T4 Ingestion (2) Thyroiditis (3) Interfering Anti TPO antibodies

REF: 1. TIETZ Fundamentals of Clinical chemistry 2.Guidlines of the American Thyroid association during pregnancy and Postpartum, 2011.

NOTE: It is advisable to detect Free T3,FreeT4 along with TSH, instead of testing for albumin bound Total T3, Total T4.TSH is not affected by variation in thyroid - binding protein. TSH has a diurnal rhythm, with peaks at 2:00 - 4:00 a.m. And troughs at 5:00 - 6:00 p.m. With ultradian variations.



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SPECIALISED CHEMISTRY - VITAMIN**COMPLETE CARE TOTAL WITH SMART REPORT****25 - HYDROXYVITAMIN D(VITAMIN D TOTAL), SERUM**

25 - HYDROXYVITAMIN D

22.4 Low

Deficiency: < 10.0 ng/mL
 Insufficiency: 10.0 - < 30.0
 Sufficiency: > 30.0 - 100.0
 Excess: > 100.0 - 150.0
 Toxicity: > 150.0

METHOD : COMPETITIVE ELECTROCHEMILUMINESCENCE IMMUNOASSAY

VITAMIN B12(CYANOCOBALAMINE), SERUM

VITAMIN B12

241

197 - 771

pg/mL

METHOD : COMPETITIVE ELECTROCHEMILUMINESCENCE IMMUNOASSAY

Interpretation(s)**25 - HYDROXYVITAMIN D(VITAMIN D TOTAL), SERUM-Test description**

Vitamin D has anti-inflammatory and immune-modulating properties and it works towards the bones, teeth, intestines, immune system, pancreas, muscles and brain. It helps to maintain normal calcium and phosphate levels. Vitamin D is a fat-soluble vitamin. Also called as "Sunshine Vitamin". Two main forms as Cholecalciferol (vitamin D3) which is synthesized in skin from 7-dehydrocholesterol in response to sunlight (Type B UV) exposure & Ergocalciferol (vitamin D2) present mainly in dietary sources.

Vit D25(OH)D deficiency is seen due to poor or inadequate sunlight exposure, Nutritional or dietary deficiency or fat malabsorption, Severe Hepatocellular disease, Secondary hyperparathyroidism, Hypocalcemia tetany which can cause involuntary contraction of muscles, leading to cramps and spasms, Rickets in children, Osteomalacia in adults- due to vitamin D deficiency mainly, Older adults- osteoporosis. (Increased risk of bone fractures) due to long-term effect of calcium and/or vitamin D deficiency, Other conditions that are precipitated by Vit D deficiency included increased cardiovascular risk, low immunity & chronic renal failure.

Elevated levels may be seen in patients taking supplements(hence recommended to repeat after 3 months for estimation of accurate levels), Vitamin D intoxication, sarcoidosis and malignancies containing non regulated 1-alpha hydroxylase in the lesion.

Recommendations

1.To prevent biotin interference the patient should be atleast 8 hours fasting before submitting the sample 2.25(OH)D is the analyte of choice for determination of the Vitamin D status as it is the major storage & active form of Vitamin D and has longer half-life. 3. Kidney Disease Outcomes Quality Initiatives (KDOQI) and Kidney Disease Improving Global Outcomes (KDIGO) recommend activated vitamin D testing for CKD patients.

Note-Our Vitamin D assays is standardized to be in alignment with the ID-LC/MS/MS 25(OH)vitamin D Reference Method Procedure (RMP), the reference procedure for the Vitamin D Standardization Program (VDSP). The VDSP, a collaboration of the National Institutes of Health Office of Dietary Supplements, National Institute of Technology and Standards, Centers for Disease Control and Ghent University, is an initiative to standardize 25(OH)vitamin D measurement across methods.

Reference:

1.Wallach Interpretation of diagnostic test, 10th edition.

VITAMIN B12(CYANOCOBALAMINE), SERUM-Test description

1.Measures the amount of Vitamin B12/ Cyanocobalamin or Methyl cobalamin in blood.2. Done in Anemic conditions like Megaloblastic anemia, pernicious anemia, dietary folate deficiencies,3.Workup of neuropathies especially due to diabetes.4.Nerve health and it is monitored in treatment of nerve damage.5.Important vitamin for women of childbearing age and for older people.

1.Part of water-soluble B complex of vitamins. 2. It is essential in DNA synthesis, hematopoiesis & CNS integrity.3.Source for B12 is dietary foods like milk, yoghurt, eggs, meat, fortified cereals, bread. 4.Absorption depends on the HCl secreted by the stomach and occurs in intestines. 5. It is part of enterohepatic circulation, hence excreted in feces(approx. 0.1% per day)

Test interpretation

Higher than normal levels are in patients on Vitamin supplements or patients with COPD, CRF, Diabetes, Liver cell damage, Obesity, Polycythemia.

Decreased levels seen in

Inflammatory bowel disease, Pernicious anemia - genetic deficiency of intrinsic factor - necessary for Vit B12 absorption, Strict vegetarians lead to sub-clinical B12 deficiency- high among elderly patients, Malabsorption due to gastrectomy, smoking, pregnancy, multiple myeloma & hemodialysis, Alcohol & drugs like amino salicylic acid, anticonvulsants, cholestyramine, cimetidine, Hyperthyroidism (High levels of thyroid), Seen in mothers of children with (NTD) Neural tube defects- hence fortification and supplements are advised in expecting mothers

Recommendations-1.To prevent biotin interference the patient should be atleast 8 hours fasting before submitting the sample. 2. Vit B12 and Folic acid evaluated together in macrocytic anemias to avoid methyl folate trap. Carmel's composite criteria for inadequate Vit B12 status: Serum vitamin B12 < 148 pmol/L, or 148-258 pmol/L and MMA > 0.30μmol/L, or tHcy > 13 nmol/L (females) and >15 nmol/L (males).

Associated Test-Holo-TC: Marker of vitamin B12 status -specificity and sensitivity better than serum vitamin B12, hence recommended in borderline and deficient cases for confirmation.



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Patient Ref. No. 2000011999637

PATIENT NAME : MOHIT GOKHALE**REF. DOCTOR : SELF****CODE/NAME & ADDRESS : C000101325**

FPSC RELIEF DIAGNOSTIC CENTRE KANDIVALI
SHOP NO. 17, BLOCK C, VICEROY COURT, CHSL,
THAKUR VILLAGE, KANDIVALI(EAST),
MUMBAI 400101
9867964796

ACCESSION NO : 0002WI033389**PATIENT ID : MOHIM799495530****CLIENT PATIENT ID:****ABHA NO :****AGE/SEX : 19 Years Male****DRAWN : 22/09/2023 10:05:24****RECEIVED : 22/09/2023 13:01:55****REPORTED : 22/09/2023 17:42:24****Test Report Status Final****Results****Biological Reference Interval Units**

References-O*****Leary F, Samman S. Vitamin B12 in health and disease. Nutrients. 2010 Mar 2(3):299-316.

****End Of Report****

Please visit www.agilusdiagnostics.com for related Test Information for this accession

CONDITIONS OF LABORATORY TESTING & REPORTING

1. It is presumed that the test sample belongs to the patient named or identified in the test requisition form.
2. All tests are performed and reported as per the turnaround time stated in the AGILUS Directory of Services.
3. Result delays could occur due to unforeseen circumstances such as non-availability of kits / equipment breakdown / natural calamities / technical downtime or any other unforeseen event.
4. A requested test might not be performed if:
 - i. Specimen received is insufficient or inappropriate
 - ii. Specimen quality is unsatisfactory
 - iii. Incorrect specimen type
 - iv. Discrepancy between identification on specimen container label and test requisition form
5. AGILUS Diagnostics confirms that all tests have been performed or assayed with highest quality standards, clinical safety & technical integrity.
6. Laboratory results should not be interpreted in isolation; it must be correlated with clinical information and be interpreted by registered medical practitioners only to determine final diagnosis.
7. Test results may vary based on time of collection, physiological condition of the patient, current medication or nutritional and dietary changes. Please consult your doctor or call us for any clarification.
8. Test results cannot be used for Medico legal purposes.
9. In case of queries please call customer care (91115 91115) within 48 hours of the report.

Agilus Diagnostics Ltd

Fortis Hospital, Sector 62, Phase VIII,
Mohali 160062


Dr. Deepak Sanghavi
 Chief Of Lab - Mumbai Reference
 Lab


Dr. Apeksha Sharma
 D.P.B., DNB (PATH)
 (Reg.no.MMC2008/06/2561)
 Consultant Pathologist

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[View Details](#)[View Report](#)**PERFORMED AT :**

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 Mumbai, 400062
 Maharashtra, India
 Tel : 9111591115, Fax :
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