Mr. ABHINAV THAKUR
..
Tel No : 9454786340
PID NO: P10923513683029
Age: 26 Year(s) Sex: Male

230162501515315

Reference: Dr.CITI PATHLABS

Sample Collected At:
Arc - Citi Pathology
Mig-216-215,gautam Nagar,govindpura
Bhopal-462023.
Processing Location:- Metropolis Healthcare Ltd,Unit No409-416,4th Floor,Commercial Building-1,Kohinoor Mall,Mumbai-70

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Registered On:
08/11/2023 04:36 PM
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08/11/2023 4:29PM
Reported On:
09/11/2023 05:08 PM

CBC Haemogram

Investigation	Observed Value	Unit	Biological Reference Interval
Erythrocytes			
Haemoglobin (Hb)	15.6	gm/dL	14-18
Erythrocyte (RBC) Count	5.36	mill/cu.mm	4.4-6.0
PCV (Packed Cell Volume)	47.4	%	42-52
MCV (Mean Corpuscular Volume)	88.5	fL	82-101
MCH (Mean Corpuscular Hb)	29.2	pg	27-34
MCHC (Mean Corpuscular Hb Concn.)	33.0	g/dL	31.5-36
RDW (Red Cell Distribution Width)	**14.7**	%	11.5-14.0
RBC Morphology			
Remark	Normochromic Normocytic		
Leucocytes			
Total Leucocytes (WBC) count	**10,800**	cells/cu.mm	4300-10300
Absolute Neutrophils Count	6588	/c.mm	2000-7000
Absolute Lymphocyte Count	2700	/c.mm	1000-3000
Absolute Monocyte Count	972	/c.mm	200-1000
Absolute Eosinophil Count	432	/c.mm	20-500
Absolute Basophil Count	**108**	/c.mm	20-100
Neutrophils	61	%	40-80
Lymphocytes	25	%	20-40
Monocytes	9	%	2.0-10
Eosinophils	4	%	1-6
Basophils	1	%	0-2
Platelets			
Platelet count	236	10^3 / µl	140-440
MPV (Mean Platelet Volume)	10.0	fL	7.8-11
PCT (Platelet crit)	0.236	%	0.2-0.5
PDW (Platelet Distribution Width)	16.7	%	9-17

Note:- Kindly note change in reference ranges.

EDTA Whole Blood-Tests done on Automated Five Part Cell Counter. (RBC and Platelet count by impedance/Hydrodynamic focusing,WBC and differential by VCS technology/Impedance/Flow cytometry.Rest are calculated parameters).All Abnormal

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Haemograms are reviewed confirmed microscopically.Differential count is based on approximately 10,000 cells.

MC-2139

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Investigation	Observed Value	Unit	Biological Reference Interval
Glucose Random (Plasma-R,Hexokinase)	84	mg/dL	Diabetes mellitus:: >= 200 (on more than one occassion) (American diabetes association guidelines 2022)

Interpretation:
- High levels (More than or equal to 400 mg/dL) are considered a critical value.
- Infants older than 1 week: Low levels (Less thn or equal to 40 mg/dL) are considered to be potentially life threatening.
- Infants younger than 1 week: Low levels (Less than or equal to 25 mg/dL) are considered to be potentially life threatening.

Clinical Utility:
- Helpful in evaluation of diabetes and other carbohydrate metabolism disorders including gestational diabetes, neonatal hypoglycemia, idiopathic hypoglycemia and pancreatic islet cell carcinoma.

Note:
- Whole blood glucose levels (capillary blood/ glucometer samples) are 12 – 15% lower than plasma concentrations.
- Exercise immediately before sample collection can lower random glucose test results.

Associated Tests:
- HbA1c(H0018), Diabetes Profile – Maxi (D0021)

Reference:

- Kit insert
- Tietz Fundamentals of Clinical Chemistry and Molecular Diagnostics. 8th edition. Edited by CA Burtis.

Lipid Profile-2
(Serum)

Cholesterol-Total (Enzymatic)	167	mg/dL	Desirable: < 200 Borderline High: 200-240 High: >= 240
Triglycerides level (Enzymatic)	111	mg/dL	Normal: < 150 Borderline High: 150-199 High: 200-499 Very High: >= 500
HDL Cholesterol (Homogeneous enzymatic colorimetric assay)	**36**	mg/dL	Major risk factor for heart disease: < 40 Negative risk factor for heart disease: >= 60
Non HDL Cholesterol (Calculated)	**131.0**	mg/dL	Optimal: < 130 Desirable: 130-159 Borderline high: 159-189 High: 189-220 Very High: >= 220

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Investigation	Observed Value	Unit	Biological Reference Interval
LDL Cholesterol (Calculated)	**108.8**	mg/dL	Optimal: < 100 Near Optimal: 100-129 Borderline high: 130-159 High: 160-189 Very High: >= 190
VLDL Cholesterol (Calculated)	22.2	mg/dL	6-38
LDL/HDL RATIO (Calculated)	3.02		2.5-3.5
CHOL/HDL RATIO (Calculated)	4.64		3.5-5

Note: Reference Interval as per National Cholesterol Education Program (NCEP) Adult Treatment Panel III Report.

VLDL,CHOL/HDL RATIO,LDL/HDL RATIO,LDL Cholesterol,serum,Non HDL Colesterol are calculated parameters

BUN-Blood Urea Nitrogen (Serum,Urease)	18.7	mg/dL	6-20

Remark: In blood, Urea is usually reported as BUN and expressed in mg/dl. BUN mass units can be converted to urea mass units by multiplying by 2.14.

Urea, Serum
(Serum)

BUN-Blood Urea Nitrogen (Urease)	18.7	mg/dL	6-20

Remark: In blood, Urea is usually reported as BUN and expressed in mg/dl. BUN mass units can be converted to urea mass units by multiplying by 2.14.

Urea Serum	40.02	mg/dL	19-44
Creatinine (Serum,Jaffes method(IDMS TRACEBLE))	**0.87**	mg/dL	0.90-1.30

Interpretation - Creatinine is a waste product formed in muscles from the high energy storage compound, creatine phosphate. The amount of creatinine produced is constant (unlike Urea) and is primarily a function of muscle mass.
Physiological factors affecting serum creatinine concentration includes age, gender, race, muscularity, exercise, Pregnancy, certain drugs, diet, dehydration and nutritional status.
Low serum Creatinine levels is seen in cases of low muscle mass like muscular atrophy, or aging.
High serum creatinine levels is seen in Acute and Chronic kidney disease, obstruction.
Since a rise in blood creatinine is observed only with marked damage of the nephrons, it is not suited to detect early stage kidney disease.

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Investigation	Observed Value	Unit	Biological Reference Interval
Calcium (Serum,NM-BAPTA)	9.5	mg/dL	8.6-10.0
Magnesium (Serum,Colorimetry end point (Xylidyl blue))	2.49	mg/dL	1.6-2.6

Interpretation:

- High levels of magnesium may result from taking too many supplements/antacids/laxatives that contain magnesium, kidney disease, Addison disease, dehydration and diabetic ketoacidosis.
- Low levels of magnesium may be seen in chronic diarrhea, hemodialysis, gastrointestinal disorders, cirrhosis, hyperaldosteronism, hypoparathyroidism, severe burns, pancreatitis, preeclampsia, ulcerative colitis and uncontrolled diabetes.

Clinical Utility:

- Magnesium is a mineral that is important for immunity, muscle contraction, nerve function, strong bones and regulating blood pressure as well as blood sugar.
- Helps in monitoring patients with preeclampsia who are on magnesium sulfate supplements.

Note:

- Heavy periods and excessive sweating may affect the test results.
- Magnesium blood levels tend to be decreased in the second and third trimesters of pregnancy.
- It is suggested to stop taking magnesium supplements for a few days before the test

Caution:

- Drugs that can increase magnesium levels include lithium, aspirin, thyroid medication, few antibiotics and products that contain magnesium.
- Drugs that can decrease magnesium levels include digoxin, cyclosporine, diuretics, insulin, few antibiotics and phenytoin.

Associated Tests: Sodium (S0032), Calcium (C0017), Potassium (P0078), Chloride (C0101), Parathyroid hormone (P0114)

References:

- Kit Insert.
- Tietz Textbook of Clinical Chemistry. Chapter 49: Fourth edition.
- Henry's Clinical Diagnosis and Management by Laboratory Methods. 22nd ed. St Louis, MO: Elsevier; 2017.

Amylase level (Serum,Enzymatic colorimetric assay acc. to IFCC.)	62	U/L	28-100

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Investigation	Observed Value	Unit	Biological Reference Interval

Interpretation:

- High levels are seen in various pancreatic as well as salivary gland disorders, intestinal blockage, peptic ulcer, appendicitis, viral hepatitis, burns and acute alcohol poisoning.
- Low levels are seen in bone fracture, chronic heart failure, chronic pancreatitis, liver and kidney diseases.

Clinical Utility:

- Helps in diagnosing acute pancreatitis and other pancreatic diseases.
- In acute pancreatitis, high amylase levels are usually associated with high lipase concentrations, although lipase levels may take a while to rise than blood amylase levels and will remain elevated for a longer time period.

Note:

- Pregnancy and recent kidney transplant affects the test results.
- Usage of drugs like aspirin, diuretics, oral contraceptives, corticosteroids, indomethacin, ethyl alcohol and opiates also interfere in test results.
- Amylase levels may be increased in patients with Macroamylase. It can be confirmed by testing serum lipase and urinary amylase levels.

Associated Tests: Lipase Serum (L0068), Urinary amylase (A0433_24/ A0433_24H)

Reference:

- Kit Insert.
- Henry's Clinical Diagnosis and Management by Laboratory Methods. 24th ed. Philadelphia, PA: Elsevier; 2022:chap 23

CPK-Creatinine Phospho Kinase (Serum,CK-NAC IFCC)	101	U/L	< 190

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Investigation	Observed Value	Unit	Biological Reference Interval

Interpretation :

- Creatinine Kinase (CK) is also called as creatinine phosphokinase (CPK) or phosphocreatine kinase.
- CPK levels are useful for diagnosing and monitoring of Heart & Muscle related issues such as myocardial infraction (MI) and myopathies.
- Creatine kinase activity begins to rise within 12 hours of Acute Myocardial infarction symptoms, peaks at 24 to 36 hours, and normalizes after 48 to 72 hours

Clinical Utility:
The CPK test used primarily

- To help diagnose a heart attack/chest pain
- To assess the extent of damage to heart or muscle tissue
- To determine muscular dystrophy.It also helps in diagnosis of
- Myositis
- Malignant hyperthermia
- Other conditions related to muscle breakdown.

Caution:

- Exercise, muscle trauma, recent surgery, cardiac catheterization, some vaccines can elevate CPK values.
- Presence of Macro CK may elevate CPK levels.
- Medications that interfere with CPK test are steroids, anesthetics, Amphotericin B, alcohol, Cocaine.

Associated Tests: CPK Isoenzymes Serum (C0164).

Reference:

- Package insert
- Wallach's interpretation of diagnostic tests, Ed11, 2020
- Tietz fundamentals of clinical chemistry 6th edition. Burtis CA, Ashwood ER, Bruns DE, 2008.
- Aujla RS, Patel R. Creatine Phosphokinase. [Updated 2022 Apr 14]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK546624/

	Proteins (Serum)			
	Total Protein (Biuret)	7.14	g/dL	6.4-8.3
	Albumin (Bromocresol green)	4.57	g/dL	3.5-5.2
	Globulin	2.57	g/dL	1.8-3.6
	A/G Ratio (Calculated)	1.78		1.1-2.2

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Investigation	Observed Value	Unit	Biological Reference Interval

Interpretation:

- Total Proteins are useful in the diagnosis and treatment of disease involving liver, kidney, bone marrow ,metabolic and nutritional disorders.
- The protein concentration of serum is an indicator of the hydration state of the body.
- Prolonged bed rest results in decreased total protein concentration.
- The A/G ratio measures the relative ratio of albumin to globulin
- Low A/G ratio may indicate viral infections, liver and kidney disease, or autoimmune disorders. These diseases increase globulin and decrease albumin thus lowering the A/G ratio.
- A high A/G ratio may indicate diseases that make the body produce less globulin, such as genetic disorders or may result from the use of immunosuppressive drugs.

Reference:

- Juraschek SP, Moliterno AR, Checkley W, Miller ER 3rd. The Gamma Gap and All-Cause Mortality. PLoS One. 2015 Dec 2;10(12):e0143494
- Busher JT. Serum Albumin and Globulin. In: Walker HK, Hall WD, Hurst JW, editors. Clinical Methods: The History, Physical, and Laboratory Examinations. 3rd edition. Boston: Butterworths; 1990. Chapter 101.
- Pack Insert

BilirubinTotal, Direct, IndirectSerum

(Serum)

Bilirubin-Total (Diazo method)	0.35	mg/dL	0-1.2

Interpretation :

1. Total Bilirubin is the sum of the unconjugated and conjugated fractions. Total Bilirubin is elevated in hepatitis, cirrhosis, haemolytic disorders , several inherited enzyme deficiencies, and conditions causing hepatic obstruction.
2. Neonatal Bilirubin quantitation is used to monitor diseases causing jaundice in the new-born, chiefly erythroblastosis fetalis (also caused haemolytic disease of the newborn or HDN.)
3. Physiologic jaundice is seen at serum bilirubin concentrations from 7 to 17 mg/dl. Serum bilirubin concentrations greater than 17 mg/dl may be pathologic. The primary concern is the potential for bilirubin encephalopathy or kernicterus.

Bilirubin-Direct (Diazo method)	0.13	mg/dL	0.0-0.3

Note: Direct Bilirubin is elevated in conditions causing hepatic obstruction , hepatitis, cirrhosis, several inherited enzyme deficiencies, and inherited defects in canalicular excretion.

Bilirubin- Indirect (Calculated)	0.22	mg/dL	0.1-1.0

Liver Function Test-2 Inactive

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Investigation	Observed Value	Unit	Biological Reference Interval
SGOT (AST) (Serum,IFCC w/o pyridoxal phosphate activation)	17	U/L	0-40
SGPT (ALT) (Serum,IFCC w/o pyridoxal phosphate activation)	33	U/L	0-41
Alkaline Phosphatase (Serum,p-nitrophenyl phosphate(IFCC))	62	U/L	40-129
Gamma GT (GGTP) (Serum,Enzymatic IFCC)	19	U/L	< 60

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HbA1C- Glycated Haemoglobin, blood by HPLC method

(EDTA Whole Blood)

Investigation	Observed Value	Unit	Biological Reference Interval
HbA1C- Glycated Haemoglobin (HPLC)	5.5	%	Non-diabetic: <= 5.6 Pre-diabetic: 5.7-6.4 Diabetic: >= 6.5 Refer interpretation for monitoring ranges.
Estimated Average Glucose (eAG)	111.15	mg/dL	

Interpretation & Remark:

1. HbA1c is used for monitoring diabetic control. It reflects the estimated average glucose (eAG).
2. HbA1c has been endorsed by clinical groups & ADA (American Diabetes Association) guidelines 2017, for diagnosis of diabetes using a cut-off point of 6.5%.
3. Trends in HbA1c are a better indicator of diabetic control than a solitary test.
4. Low glycated haemoglobin(below 4%) in a non-diabetic individual are often associated with systemic inflammatory diseases, chronic anaemia(especially severe iron deficiency & haemolytic), chronic renal failure and liver diseases. Clinical correlation suggested.
5. To estimate the eAG from the HbA1C value, the following equation is used: eAG(mg/dl) = 28.7*A1c-46.7
6. Interference of Haemoglobinopathies in HbA1c estimation.
   A. For HbF > 25%, an alternate platform (Fructosamine) is recommended for testing of HbA1c.
   B. Homozygous hemoglobinopathy is detected, fructosamine is recommended for monitoring diabetic status
   C. Heterozygous state detected (D10/ Tosho G8 is corrected for HbS and HbC trait).
7. **In known diabetic patients, following values can be considered as a tool for monitoring the glycemic control.**
   Excellent Control - 6 to 7 %,
   Fair to Good Control - 7 to 8 %,
   Unsatisfactory Control - 8 to 10 %
   and Poor Control - More than 10 % .

Note : Hemoglobin electrophoresis (HPLC method) is recommended for detecting hemoglobinopathy.

-- End of Report --

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