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NAME	: **ASHU UPNEJA**		
Age/Gender	: 41 Y/Female	Registration No.	: 768630
Patient ID	: 182404240005	Registered Time	: 24/Apr/2024 10:02AM
BarcodeNo	: 624300	Collection Time	: 24/Apr/2024 01:28PM
Referred By	: SEJAL CLINICAL LAB	Receiving Time	: 24/Apr/2024 01:28PM
Panel	: CHD Tricity	Reporting Time	: 24/Apr/2024 01:46PM

HAEMATOLOGY

Test Name	Value	Unit	Bio Ref.Interval
CBC, COMPLETE BLOOD COUNT			
Specimen: Whole Blood EDTA			
HAEMOGLOBIN By Non-Cyanmethemoglobin	**6.9**	gm/dL	12.0-15.0
RBC COUNT By Opticalflowcytometry	4.0	million/cumm	3.8-4.8
PCV/ HAEMATOCRIT By RBC pluse height detection	**26.2**	%	36.0-46.0
MCV by Automated/Calculated	**65.0**	fL	83-101
MCH by Automated/Calculated	**17.2**	pg	27-32
MCHC by Automated/Calculated	**26.4**	%	32-36
PLATELET COUNT By Opticalflowcytometry	420	thousand	150-450
RDW (cv) by Automated/Calculated	**24.0**	%	11.5-16.0
RDW (sd) by Automated/Calculated	**47.6**	%	35-46
PDW by Calculated	16.5	fL	8.30-25.0
MPV Plt Histogram	11.7	fL	8.60-15.50
PCT by Calculated	**0.50**	%	0.17-0.35
MENTZERS INDEX	16.25		
TLC (Total Leucocyte Count) by Flow Cytometry	6.5	x10^3Cells/µL	4.0-11.0
DIFFERENTIAL LEUCOCYTE COUNT			
NEUTROPHIL Fluorescence flow cytometry/Manual	56	%	40-70
LYMPHOCYTES Fluorescence flow cytometry/Manual	31	%	20-40
EOSINOPHIL Fluorescence flow cytometry/Manual	05	%	1-5
MONOCYTES Fluorescence flow cytometry/Manual	08	%	2-10
BASOPHILS Fluorescence flow cytometry/Manual	00	%	0-02

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HAEMATOLOGY

Test Name	Value	Unit	Bio Ref.Interval
ABSOLUTE LEUKOCYTES (WBC) COUNT			
ABSOLUTE NEUTROPHIL COUNT by Calculated	3.64	x10^3Cells/µL	2.0-7.0
ABSOLUTE LYMPHOCYTES COUNT by Calculated	2.02	x10^3Cells/µL	1.0-3.0
ABSOLUTE EOSINOPHIL COUNT by Calculated	0.33	x10^3Cells/µL	0.02-0.50
ABSOLUTE MONOCYTE COUNT by Calculated	0.52	x10^3Cells/µL	0.20-1.00

CLINICAL NOTES

A complete blood count (CBC) is used to evaluate overall health and detect wide range of disorders, including anemia, infection and leukemia. There have been some reports of WBC and platelet counts being lower in venous blood than in capillary blood samples ,although still within these reference ranges.

POSSIBLE CAUSES OF ABNORMAL PARAMETERS:-

High RBC, Hb, or HCT - dehydration, polycythemia, shock, chronic hypoxia Low RBC, Hb, or HCT - anemia, thalassemia, and other Hemoglobinopathies Low MCV - microcytic anemia
High MCV - macrocytic anemia, liver disease
Low WBC - sepsis, marrow hypoplasia
High WBC - acute stress, infection, malignancies
Low platelets - risk of bleeding
High platelets - risk of thrombosis

Notes

Macrocytic Anemia/Dimorphic Anemia can have low platelet count.
Microcytic Anemia/Leucocytosis can have Reactive thrombocytosis.
For microcytic indices a Mentzer index of less than 13 suggests that the patient may have thalassemia trait, and an index of more than 13 suggests that the patient may have iron deficiency.
Reference ranges are from Dacie and Lewis Practical Hematology 12th edition(2016) Reference ranges may vary between laboratories.
CBC Test processed on fully automated analyser(6 Part Differential SYSMEX XN-330)
This device performs hematology analysis according to th Hydrodynamic Focusing(DC method),Flurosence Flow cytometry Method(using a semiconductor laser) and SLS-Hb method.

Note : The result obtained relate only to the sample given/ received & tested. A single test result is not always indicative of a disease, it has to be correlated with clinical data for interpretation.

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HAEMATOLOGY

Test Name	Value	Unit	Bio Ref.Interval
ESR (WESTERGREN`s METHOD)			
ESR [WESTERGREN] Sedimentation	**43**	mm/1st	0 - 15

Note:-

1. **Test conducted on EDTA whole blood at 37°C.**
2. **ESR readings are auto- corrected with respect to Hematocrit (PCV) values.**

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HAEMATOLOGY

Test Name	Value	Unit	Bio Ref.Interval
HbA1C			
Hb A1C, GLYCOSYLATED Hb by HPLC	5.40	%	Non-Diabetic < 6.0 Good Control 6.0-7.0 Weak Control 7.0-8.0 Poor control > 8.0
Estimated Average Glucose	108.28	mg/dL	

Expected Values :

Non Diabetic	< 6.0	%
Goal	< 7.0	%
Action Suggested	> 8.0	%

Comment:-

Glycosylated Hb is a normal adult Hb which is covalently bounded to a glucose molecule. Glycosylated Hb concentration is dependent on the average blood glucose concentration and is stable for the life of the RBC (120 days). Glycohaemoglobin serves as suitable marker of metabolic control of diabetics. Its estimation is unaffected by diet, insulin, exercise on day of testing and thus reflects average blood glucose levels over a period of last several weeks /months. There is a 3 - 4 week time before percent Glycohaemoglobin reflects changes in blood glucose levels.

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BIOCHEMISTRY

LIPID PROFILE

Specimen: Serum

Test Name	Value	Unit	Bio Ref.Interval
TOTAL CHOLESTEROL Enzymatic(CHO-POD)	143.80	mg/dL	Desirable < 200 Borderline 200 - 239 High > 240
TRIGLYCERIDES , Serum GPO-POD	82.50	mg/dL	Normal 150 Border line high 150-199 High 200-490
HDL-CHOLESTEROL , Serum Direct measure	44.00	mg/dL	40-60
LDL CHOLESTEROL,Serum Calculated	83.30	mg/dL	Optimal<100 Near or Above Optima-l00-129 Borderline High 130-159 High 160 - 189
NON HDL CHOLESTEROL Calculated	99.80	mg/dL	Optimal<130 Near or Above Optima-l30-159 Borderline High 160 - 189 High 190 - 219
VLDL ,Serum Calculated	16.50	mg/dL	0.0- 30.0
TOTAL LIPIDS Calculated	370.10	mg/dL	350.00-700.00
TOTAL CHOLESTEROL /HDL RATIO ,Serum Calculated	3.27		< 4.97
LDL / HDL CHOLESTEROL RATIO Calculated	1.89		1.5-3.5
TRIGLYCERIDES/HDL RATIO Calculated	**1.88**	RATIO	3.00-5.00

ALERT!!! 10-12 hours fasting is mandatory for lipid parameters.If not,values might fluctuate.

CLINICAL NOTES:-Lipid profile is initial screening tool for abnormalities in lipids. The results of this test can identify certain genetic diseases & can determine approximate risks for cardiovascular disease, certain forms of pancreatitis. Hypertriglyceridemia is indicative of insulin resistance when present with low HDL & elevated LDL, while elevated TG is risk factor for coronary artery disease,especially when low HDL is present.TG of 500mg/dL or more can be concerning for development of pancreatitis.

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BIOCHEMISTRY

LIVER FUNCTION TEST(LFT)

Test Name	Value	Unit	Bio Ref.Interval
BILIRUBIN TOTAL DPD	1.01	mg/dL	0.1-1.2
DIRECT BILIRUBIN(CONJUGATED), Serum DPD	0.16	mg/dL	< 0.20
INDIRECT BILIRUBIN(Unconj.),Serum Calculated	**0.85**	mg/dL	0.20-0.80
TOTAL PROTEIN , Serum Biuret	7.70	g/dL	6.6-8.3
ALBUMIN,SERUM BCG	4.36	g/dL	3.5-5.0
GLOBULIN,Serum Calculated	3.34	gm/dL	2.3-3.5
A/G RATIO Calculated	1.31		1.0 - 2.3
SGOT (AST) ,Serum IFCC	19.50	U/L	0-50
SGPT (ALT), Serum IFCC	13.20	U/L	0-50
SGOT/SGPT RATIO	1.48		
ALKALINE PHOSPHATASE ,Serum IFCC	70.6	U/L	30-120
GAMMA GT ,Serum IFCC	26.70	U/L	5 - 64

COMMENT:-

These are group of tests that can be used to detect the presence of liver disease, distinguish among different types of liver disorders, gauge the extent of known liver damage, and monitor the response to treatment. Most liver diseases cause only mild symptoms initially, but these diseases must be detected early. Some tests are associated with functionality (e.g., albumin), some with cellular integrity (e.g., transaminase), and some with conditions linked to the biliary tract (gamma-glutamyl transferase and alkaline phosphatase). Conditions with elevated levels of ALT and AST include hepatitis A,B ,C ,paracetamol toxicity etc.Several biochemical tests are useful in the evaluation and management of patients with hepatic dysfunction. Some or all of these measurements are also carried out (usually about twice a year for routine cases) on those individuals taking certain medications, such as anticonvulsants, to ensure that the medications are not adversely impacting the person's liver.Reference ranges are from Teitz fundamental of clinical chemistry 8th ed (2018) Reference ranges vary between laboratories.

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BIOCHEMISTRY

Test Name	Value	Unit	Bio Ref.Interval
KFT AND ELECTROLYTES			
UREA Urease	22.1	mg/dL	17.0 -43.0
CREATININE , Serum JAFFE (IDMS)	0.79	mg/dL	0.60-1.40
BLOOD UREA NITROGEN UREASE	10.33	mg/dl	9 - 20
URIC ACID , Serum Uricase	3.60	mg/dL	2.4-5.7
CALCIUM , Serum Arsenazo	9.82	mg/dL	8.6 - 10.6
PHOSPHORUS , Serum Phosphomolybdate	2.94	mg/dL	2.5 - 4.5
BLOOD UREA NITROGEN (BUN)/CREATININE RATIO CALCULATED	13.08	RATIO	10.0 - 20.0
UREA/CREATININE RATIO	27.97		
eGFR Calculated	85.37	mL/min/1.73m2	
ELECTROLYTES			
SODIUM (SERUM) ISE	139.5	mmol/L	137-145
POTASSIUM (SERUM) ISE	3.99	mmol/L	3.5-5.1
CHLORIDE ISE Direct	102.60	mmol/L	98-107

Kidney function tests are group of tests that can be used to evaluate how well the kidneys are functioning. Creatinine is a waste product that comes from protein in the diet and also comes from the normal wear and tear of muscles of the body. In blood, it is a marker of GFR .in urine, it can remove the need for 24-hour collections for many analytes or be used as a quality assurance tool to assess the accuracy of a 24-hour collection Higher levels may be a sign that the kidneys are not working properly. As kidney disease progresses, the level of creatinine and urea in the blood increases. Certain drugs are nephrotoxic hence KFT is done before and after initiation of treatment with these drugs.

Low serum creatinine values are rare; they almost always reflect low muscle mass. Apart from renal failure Blood Urea can increase in dehydration and GI bleed.

Note : The result obtained relate only to the sample given/ received & tested. A single test result is not always indicative of a disease, it has to be correlated with clinical data for interpretation.

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BIOCHEMISTRY

Test Name	Value	Unit	Bio Ref.Interval
IRON PROFILE			
Iron TPTZ	**31.20**	ug/dL	60-180
TOTAL IRON BINDING CAPACITY Calculated	246.10	ug/dL	240-450
UIBC NiTRO-PSAP	214.90	ug/dL	155-355
TRANSFERRIN NEPHELOMETRY	**174.73**	mg/dL	178 - 354
TRANSFERRIN SATURATION Calculated	**12.68**	%	15.0-50.0

Comment:

Most body iron is found in hemoglobin. The serum measurement of iron is useful in the differential diagnosis of anemia, iron deficiency anemia, thalassemia, possible sideroblastic anemia, and iron poisoning. Total iron-binding capacity in serum, representing transferrin concentration in iron-binding capacity, is a useful index of nutritional iron status.

Iron deficiency anemia is characterized by a decreased serum Fe, increased TIBC or transferrin, and a decreased transferrin saturation. Serum TIBC is increased in iron deficiency. Serum TIBC is decreased in anemia of chronic disease.

Iron is an essential trace mineral element which forms an important component of hemoglobin, metallocompounds and Vitamin A. Deficiency of iron, leads to microcytic hypochromic anemia. The toxic effects of iron are deposition of iron in various organs of the body and hemochromatosis.

Total Iron Binding capacity (TIBC) is a direct measure of the protein Transferrin which transports iron from the gut to storage sites in the bone marrow. In iron deficiency anemia, serum iron is reduced and TIBC increases.

Transferrin Saturation occurs in Idiopathic hemochromatosis and Transfusional hemosiderosis where no unsaturated iron binding capacity is available for iron mobilization. Similar condition is seen in congenital deficiency of Transferrin

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IMMUNOLOGY

Test Name	Value	Unit	Bio Ref.Interval
THYROID PROFILE			
T3 ,Serum byCLIA	1.14	ng/mL	0.87 - 1.78
T4 ,Serum byCLIA	6.52	ug/dl	3.06 - 12.54
TSH by CLIA	2.30	µIU/ml	0.34-5.60

Comments:

T3 is physiologically more active than T4 & plays an important role in maintaining euthyroidism.

T3 circulates in free form (0.3 %) and in bound form (99.7%).

T4 is predominantly bound to carrier protein - thyroid binding globulin (TBG-99.9%).

T4 assay aids in diagnosis of hyperthyroidism - primary or secondary hypothyroidism & thyroid hormone resistances.

T4 there must also be associated with the other three of the thyroid assessment, such as TSH & T3 as well as with the clinical examina on to the patient TSH levels are subject to circadian variation, reaching peak levels between 2am to 4am and at a minimum between 6pm to 10pm. The varia on is of the order of 50%; hence time of the day has influence on the measured serum TSH concentrations. Significant numbers of parents particularly those above 55 years of age have a serum TSH level between 4.68 & 10 µIU/ml.

This borderline elevation may be due to presence of SUBCLINICAL HYPOTHYROIDISM. Thyroid profile and an -thyroid (an TPO & TG) an bodies es ma on is suggested in all such cases.

Very low serum TSH values are observed in patients who are being treated for hypothyroidism. In such patients Serum Free T3 & Free T4 estimation may also be performed.

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:

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IMMUNOLOGY

Test Name	Value	Unit	Bio Ref.Interval

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.
7.DRUGS: Glucocorticoids, Dopamine, Levodopa, T4 replacement therapy, Anti-thyroid drugs for thyrotoxicosis.

LIMITATIONS:-
1. T3 and T4 circulates in reversibly bound form with Thyroid binding globulins (TBG),and to a lesser extent albumin and Thyroid binding Pre Albumin so conditions in which TBG and protein levels alter such as pregnancy, excess estrogens, androgens, anabolic steroids and glucocorticoids may falsely affect the T3 and T4 levels and may cause false thyroid values for thyroid function tests.
2. Normal levels of T4 can also be seen in Hyperthyroid patients with :T3 Thyrotoxicosis, Decreased binding capacity due to hypoproteinemia or ingestion of certain drugs (eg: phenytoin , salicylates).
3. Serum T4 levles in neonates and infants are higher than values in the normal adult , due to the increased concentration of TBG in neonate serum.
4. TSH may be normal in central hypothyroidism , recent rapid correction of hyperthyroidism or hypothroidism , pregnancy , phenytoin therapy.

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IMMUNOLOGY

Test Name	Value	Unit	Bio Ref.Interval
VITAMIN D (25 OH)			
VITAMIN D(25 OH) ,Serum CLIA	25.10	ng/mL	< 20 Deficiency 20- 30 Insufficiency 30-100 Sufficienty >100 Toxicity

Expected Values

Deficiency	<20 ng/mL
Insufficiency	20-<30 ng/mL
Sufficiency	30-100 ng/mL
Toxocity	>100.0

Note: It should be taken into cosideration that differences in Vitamin D (25-OH) levels may exist with respect to gender, age, season, geographical latitude and ethnic groups

Comments

Vitamin D Total assay is used as an aid in the assesment of Vitamin D sufficiency in adults.

Vitamin D is acquired either by exposure to sunlight or ingestion of food containing vitamin D. It is metabolized to vit D, 25 hydroxy in the liver in the first step by vit D,25-hydroxylase system. A small amount of it further gets metabolized by hydroxylation in kidney to vit D 1,25 dihydroxy. Since vit D, 25 hydroxy is the predominant circulating form of Vit D in normal population, it is considered to be the most reliable index of vit D status.

Vitamin D is essential for bone health. In children, severe deficiency leads to bone-malformation, known as rickets. Milder degrees of insufficiecy are believed to cause reduced efficiency in the utilization of dietary calcium.

The measurement of 25-OH-D is becoming increasingly important in the management of patients with various disorders of calcium metabolism associated with Rickets, neonatal hypocalcemia, pregnancy, nutritional and renal osteodystrophy, hypoparathyroidism, and postmenopausal state.

Increased levels are found in Vit D intoxication.

Decreased levels are detected in Rickets, osteomalacia, secondary hyperparathyroidism, malabsorption of vit D (e.g. liver diseases, cholestasis), and diseases that increase Vit D metabolism (viz. Tuberculosis, sarcoidosis, primary hyperparathyroidism).

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IMMUNOLOGY

Test Name	Value	Unit	Bio Ref.Interval
VITAMIN B12			
VITAMIN B12 LEVEL ,Serum CLIA	536.00	pg/mL	180-914

Comment

Vitamin B12 belongs to the corrin family it is a cofactor for the conversion of methylemalonyl coenzyme A to succinyl coenzyme A, synthesis of methionine from homocysteine and formation of myelin. It is required along with folate for DNA synthesis. The major source of vitamin B12 for human beings is meat, while herbivorous animals get their requirement from contaminated vegetable matter and coprophagy. Megaloblastic anaemia can be due to cobalamin & or folic acid deficiency.
Vitamin B12 or Cyanocobalamin, is a complex corrinoid compound containing four pyrrole rings
that surround a single cobalt atom. Humans obtain vitamin B12 exclusively from animal dietary sources,
such as meat, eggs and milk.
Clinical and laboratory findings for Vitamin B12 deficiency include neurological abnormalities,
decreased serum B12 levels and increased excretion of methylmalonic acid. The impaired DNA synthesis
associated with Vitamin B12 deficiency causes macrocytic anaemias. These anaemias are characterized by abnormal maturation of erythrocyte precursors in the Bone-Marrow, which results in the presence of magaloblasts and in decreased erythrocyte survival.
Pernicious anaemia is a macrocytic anaemia caused by Vitamin B12 deficiency that is due to lack of intrinsic factor. Low Vitamin B12 intake, gastrectomy, diseases of small intestine, malabsorption and trans-cobalamin deficiency can also cause Vitamin B12 deficiency.

Increased Levels :-

1. Renal failure
2. Liver disease

Decreased Levels :-

1. Megaloblastic anemia
2. Vegetarianism

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IMMUNOLOGY

Test Name	Value	Unit	Bio Ref.Interval

TESTOSTERONE TOTAL

TESTOSTERONE TOTAL ,Serum by CLIA	36.90	ng/dl	7.21-79.30

	Age	Min	Max	Unit
Male	0-49 years	1.63 (47.01)	34.0 (980.56)	nmol/l (ng/dl)
Male	>50 years	4.41 (127.18)	35.38 (1020.36)	nmol/l (ng/dl)
Female	0-49 years	0.25 (7.21)	2.75 (79.3)	nmol/l (ng/dl)
Female	>50 years	0.30 (8.65)	1.28 (36.9)	nmol/l (ng/dl)

Comments :

Testosterone is secreted in females by the ovary and formed indirectly from androstendione in adrenal glands. In males it is secreted by the testes. It circulates in blood, bound largely to sex hormone binding globulin (SHBG). Less than 1% of the total testosterone is in the free form. The bioavailable fractions include the free form and that "weakly bound" to albumin (40% of the total in men and 20% of total in women) & bound to cortisol binding globulin (CBG). It is the most potent circulating androgenic hormone. The total testosterone bound of SHBG fluctuates ,since SHBG levels are effected by medication, disease, sex steroids and insulin.

INCREASED LEVELS

Precocious puberty (Males)
Congenital Adrenal Hyperplasia
Polycystic ovarian disease
Ovarian tumours
Androgen resistance

DECREASED LEVELS

Delayed puberty (Males)

Kindly correlate clinically.

*** End Of Report ***

[-Scan to Verify-]

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