A28 - MR. MANINDAR SINGH - ANVI
COLLECTION CENTRE, SIRSA
SANJEEV MARKET, SIRSA, NEAR HANUMAN TEMPLE, G.B. NAGAR, UP

Name	: **Mrs. MADHU JAIN**			**Collected**	: **22/3/2021 10:44:00AM**
Lab No.	: **305816504**	**Age: 61 Years**	**Gender: Female**	**Received**	: **22/3/2021 2:08:00PM**
				Reported	: **23/3/2021 9:06:55PM**
A/c Status	: **P**	**Ref By : SELF**		**Report Status**	: **Final**

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Test Name	Results	Units	Bio. Ref. Interval
COMPLETE BLOOD COUNT;CBC (Electrical Impedence & Flow)			
Hemoglobin	12.30	g/dL	12.00 - 15.00
Packed Cell Volume (PCV)	41.20	%	36.00 - 46.00
RBC Count	4.19	mill/mm3	3.80 - 4.80
MCV	98.30	fL	83.00 - 101.00
MCH	29.40	pg	27.00 - 32.00
MCHC	**29.90**	g/dL	31.50 - 34.50
Red Cell Distribution Width (RDW)	13.80	%	11.60 - 14.00
Total Leukocyte Count (TLC)	4.80	thou/mm3	4.00 - 10.00
Differential Leucocyte Count (DLC)			
Segmented Neutrophils	50.40	%	40.00 - 80.00
Lymphocytes	39.00	%	20.00 - 40.00
Monocytes	7.70	%	2.00 - 10.00
Eosinophils	2.90	%	1.00 - 6.00
Basophils	0.00	%	<2.00
Absolute Leucocyte Count			
Neutrophils	2.42	thou/mm3	2.00 - 7.00
Lymphocytes	1.87	thou/mm3	1.00 - 3.00
Monocytes	0.37	thou/mm3	0.20 - 1.00
Eosinophils	0.14	thou/mm3	0.02 - 0.50
Basophils	**0.00**	thou/mm3	0.02 - 0.10

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Test Name	Results	Units	Bio. Ref. Interval
Platelet Count	230.0	thou/mm3	150.00 - 410.00
Mean Platelet Volume	10.8	fL	6.5 - 12.0

Note

1. As per the recommendation of International council for Standardization in Hematology, the differential leucocyte counts are additionally being reported as absolute numbers of each cell in per unit volume of blood

2. Test conducted on EDTA whole blood

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Test Name	Results	Units	Bio. Ref. Interval
LIVER & KIDNEY PANEL, SERUM (Spectrophotometry, Indirect ISE)			
Bilirubin Total	0.51	mg/dL	0.20 - 1.10
Bilirubin Direct	0.11	mg/dL	<0.30
Bilirubin Indirect	0.40	mg/dL	<1.10
AST (SGOT)	17	U/L	<35
ALT (SGPT)	13	U/L	<35
GGTP	<10	U/L	<38
Alkaline Phosphatase (ALP)	72	U/L	30 - 120
Total Protein	**6.10**	g/dL	6.40 - 8.10
Albumin	4.10	g/dL	3.20 - 4.60
A : G Ratio	**2.05**		0.90 - 2.00
Urea	**14.00**	mg/dL	17.00 - 43.00
Creatinine	0.68	mg/dL	0.51 - 0.95

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Test Name	Results	Units	Bio. Ref. Interval
Uric Acid	3.60	mg/dL	2.60 - 6.00
Calcium, Total	9.20	mg/dL	8.80 - 10.20
Phosphorus	**4.20**	mg/dL	2.80 - 4.00
Sodium	143.00	mEq/L	136.00 - 146.00
Potassium	3.86	mEq/L	3.50 - 5.10
Chloride	109.00	mEq/L	101.00 - 109.00

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Test Name	Results	Units	Bio. Ref. Interval
HbA1c (GLYCOSYLATED HEMOGLOBIN), BLOOD (HPLC)			
HbA1c	**5.8**	%	4.00 - 5.60
Estimated average glucose (eAG)	120	mg/dL	

Interpretation
HbA1c result is suggestive of at risk for Diabetes (Prediabetes)/ well controlled Diabetes in a known Diabetic

Note: Presence of Hemoglobin variants and/or conditions that affect red cell turnover must be considered, particularly when the HbA1C result does not correlate with the patient's blood glucose levels.

FACTORS THAT INTERFERE WITH HbA1C MEASUREMENT	FACTORS THAT AFFECT INTERPRETATION OF HBA1C RESULTS
Hemoglobin variants,elevated fetal hemoglobin (HbF) and chemically modified derivatives of hemoglobin (e.g. carbamylated Hb in patients with renal failure) can affect the accuracy of HbA1c measurements	Any condition that shortens erythrocyte survival or decreases mean erythrocyte age (e.g.,recovery from acute blood loss, hemolytic anemia, HbSS, HbCC, and HbSC) will falsely lower HbA1c test results regardless of the assay method used.Iron deficiency anemia is associated with higher HbA1c

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Test Name	Results	Units	Bio. Ref. Interval
GLUCOSE, FASTING (F), PLASMA (Hexokinase)	86.00	mg/dL	70.00 - 100.00
VITAMIN B12; CYANOCOBALAMIN, SERUM (CLIA)	689.00	pg/mL	211.00 - 911.00

Notes

1. Interpretation of the result should be considered in relation to clinical circumstances.
2. It is recommended to consider supplementary testing with plasma Methylmalonic acid (MMA) or plasma homocysteine levels to determine biochemical cobalamin deficiency in presence of clinical suspicion of deficiency but indeterminate levels. Homocysteine levels are more sensitive but MMA is more specific
3. False increase in Vitamin B12 levels may be observed in patients with intrinsic factor blocking antibodies, MMA measurement should be considered in such patients
4. The concentration of Vitamin B12 obtained with different assay methods cannot be used interchangeably due to differences in assay methods and reagent specificity

VITAMIN D, 25 - HYDROXY, SERUM (Chemiluminescence)	127.24	nmol/L

Interpretation

LEVEL	REFERENCE RANGE IN nmol/L	COMMENTS
Deficient	< 50	High risk for developing bone disease
Insufficient	50-74	Vitamin D concentration which normalizes Parathyroid hormone concentration
Sufficient	75-250	Optimal concentration for maximal health benefit
Potential intoxication	>250	High risk for toxic effects

Note

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Test Name	Results	Units	Bio. Ref. Interval

- The assay measures both D2 (Ergocalciferol) and D3 (Cholecalciferol) metabolites of vitamin D.
- 25 (OH)D is influenced by sunlight, latitude, skin pigmentation, sunscreen use and hepatic function.
- Optimal calcium absorption requires vitamin D 25 (OH) levels exceeding 75 nmol/L.
- It shows seasonal variation, with values being 40-50% lower in winter than in summer.
- Levels vary with age and are increased in pregnancy.
- A new test Vitamin D, Ultrasensitive by LC-MS/MS is also available

Comments

Vitamin D promotes absorption of calcium and phosphorus and mineralization of bones and teeth. Deficiency in children causes Rickets and in adults leads to Osteomalacia. It can also lead to Hypocalcemia and Tetany. Vitamin D status is best determined by measurement of 25 hydroxy vitamin D, as it is the major circulating form and has longer half life (2-3 weeks) than 1,25 Dihydroxy vitamin D (5-8 hrs).

Decreased Levels

- Inadequate exposure to sunlight
- Dietary deficiency
- Vitamin D malabsorption
- Severe Hepatocellular disease
- Drugs like Anticonvulsants
- Nephrotic syndrome

Increased levels

Vitamin D intoxication

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Test Name	Results	Units	Bio. Ref. Interval
THYROID PROFILE,TOTAL, SERUM (Chemiluminescent Immunoassay)			
T3, Total	1.20	ng/mL	0.60 - 1.81
T4, Total	10.50	µg/dL	5.01 - 12.45
TSH	0.95	µIU/mL	0.35 - 5.50

Note

1. TSH levels are subject to circadian 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 concentrations.
2. Alteration in concentration of Thyroid hormone binding protein can profoundly affect Total T3 and/or Total T4 levels especially in pregnancy and in patients on steroid therapy.
3. Unbound fraction (Free,T4 /Free,T3) of thyroid hormone is biologically active form and correlate more closely with clinical status of the patient than total T4/T3 concentration
4. Values <0.03 uIU/mL need to be clinically correlated due to presence of a rare TSH variant in some individuals

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Test Name	Results	Units	Bio. Ref. Interval
LIPID SCREEN, SERUM (Enzymatic Spectrophotometry)			
Cholesterol, Total	180.00	mg/dL	<200.00
Triglycerides	141.00	mg/dL	<150.00
HDL Cholesterol	50.50	mg/dL	>50.00
LDL Cholesterol, Calculated	**101.30**	mg/dL	<100.00
VLDL Cholesterol,Calculated	28.20	mg/dL	<30.00
Non-HDL Cholesterol	130	mg/dL	<130

Interpretation

REMARKS	TOTAL CHOLESTEROL in mg/dL	TRIGLYCERIDE in mg/dL	LDL CHOLESTEROL in mg/dL	NON HDL CHOLESTEROL in mg/dL
Optimal	<200	<150	<100	<130
Above Optimal	-	-	100-129	130 - 159
Borderline High	200-239	150-199	130-159	160 - 189
High	>=240	200-499	160-189	190 - 219
Very High	-	>=500	>=190	>=220

Note

1. Measurements in the same patient can show physiological & analytical variations. Three serial samples 1 week apart are recommended for Total Cholesterol, Triglycerides, HDL& LDL Cholesterol.
2. NLA-2014 recommends a complete lipoprotein profile as the initial test for evaluating cholesterol.

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Test Name	Results	Units	Bio. Ref. Interval

3. Friedewald equation to calculate LDL cholesterol is most accurate when Triglyceride level is < 400 mg/dL. Measurement of Direct LDL cholesterol is recommended when Triglyceride level is > 400 mg/dL
4. NLA-2014 identifies Non HDL Cholesterol(an indicator of all atherogeniclipoproteins such as LDL , VLDL, IDL, Lpa, Chylomicron remnants)along with LDL-cholesterol as co- primary target for cholesterol lowering therapy. Note that major risk factors can modify treatment goals for LDL &Non HDL.
5. Apolipoprotein B is an optional, secondary lipid target for treatment once LDL & Non HDL goals have been achieved
6. Additional testing for Apolipoprotein B, hsCRP,Lp(a) & LP-PLA2 should be considered among patients with moderate risk for ASCVD for risk refinement

Treatment Goals as per Lipid Association of India 2016

RISK CATEGORY	TREATMENT GOAL		CONSIDER THERAPY	
	LDL CHOLESTEROL (LDL-C)(mg/dL)	NON HDL CHLOESTEROL (NON HDL-C) (mg/dL)	LDL CHOLESTEROL (LDL-C)(mg/dL)	NON HDL CHLOESTEROL (NON HDL-C) (mg/dL)
Very High	<50	<80	>=50	>=80
High	<70	<100	>=70	>=100
Moderate	<100	<130	>=100	>=130
Low	<100	<130	>=130*	>=160*

*In low risk patient, consider therapy after an initial non-pharmacological intervention for at least 3 months

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Test Name	Results	Units	Bio. Ref. Interval
IRON STUDIES MONITORING PANEL			
Iron	110.00	ug/dL	50.00 - 170.00
Total Iron Binding Capacity (TIBC)	329.37	µg/dL	250 - 425
Transferrin Saturation	33.40	%	15.00 - 50.00
Ferritin	10.90	ng/mL	10.00 - 291.00

Comment

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.

Ferritin appears to be in equilibrium with tissue ferritin and is a good indicator of storage iron in normal subjects and in most disorders. In patients with some hepatocellular diseases, malignancies and inflammatory diseases, serum ferritin is a disproportionately high estimate of storage iron because serum ferritin is an acute phase reactant. In such disorders iron deficiency anemia may exist with a normal serum ferritin concentration. In the presence of inflammation, persons with low serum ferritin are likely to respond to iron therapy.

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Test Name	Results	Units	Bio. Ref. Interval
IMMUNOGLOBULIN IgE, SERUM @ (ImmunoCAP,FEIA)	32.90	kUA/L	<64.00

Note: 1. Normal levels of IgE do not rule out possibility of IgE dependent allergies as the diagnostic sensitivity of the test depends upon elapsed time between exposure to an allergen and testing, patient age and affected target organs.
2. No close correlation has been demonstrated between severity of allergic reaction and IgE levels.

Comments

Immunoglobulin E (IgE) is the most important trigger molecule for allergic information. The level of IgE is low during the first year of life, gradually increases with age and reaches adult levels after 10 years. As IgE is a mediator of allergic response, quantitative measurement can provide useful information for differential diagnosis of atopic and non-atopic disease. Patients with atopic diseases like Allergic asthma, Allergic rhinitis & Atopic dermatitis have moderately elevated IgE levels.

Increased Levels - Atopic/Non-atopic allergy, Hyper IgE syndrome, Parasitic infections, IgE Myeloma, Pulmonary Aspergillosis, Immunodeficiency states & Autoimmune diseases

Uses

- Evaluation of children with strong family history of allergies and early clinical signs of disease
- Evaluation of children and adults suspected of having allergic respiratory disease to establish the diagnosis and define the allergens
- To confirm clinical expression of sensitivity to foods in patients with Anaphylactic sensitivity or with Asthma, Angioedema or Cutaneous disease
- To evaluate sensitivity to insect venom allergens particularly as an aid in defining venom specificity in those cases in which skin tests are equivocal
- To confirm the presence of IgE antibodies to certain occupational allergens

ERYTHROCYTE SEDIMENTATION RATE (ESR) (Capillary photometry)	20	mm/hr	0.00 - 30.00

Note

1. C-Reactive Protein (CRP) is the recommended test in acute inflammatory conditions.
2. Test conducted on EDTA whole blood at 37°C.
3. ESR readings are auto- corrected with respect to Hematocrit (PCV) values.

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Test Name	Results	Units	Bio. Ref. Interval
CARDIO C-REACTIVE PROTEIN (hsCRP), SERUM * (Immunoturbidimetry)	0.22	mg/L	<1.00

Interpretation

CARDIO CRP IN mg/L	CARDIOVASCULAR RISK
<1	Low
1-3	Average
3-10	High
>10	Persistent elevation may represent Non cardiovascular inflammation

Note: To assess vascular risk, it is recommended to test hsCRP levels 2 or more weeks apart and calculate the average

Comments

High sensitivity C Reactive Protein (hsCRP) significantly improves cardiovascular risk assessment as it is a strongest predictor of future coronary events. It reveals the risk of future Myocardial infarction and Stroke among healthy men and women, independent of traditional risk factors. It identifies patients at risk of first Myocardial infarction even with low to moderate lipid levels. The risk of recurrent cardiovascular events also correlates well with hsCRP levels. It is a powerful independent risk determinant in the prediction of incident Diabetes.

C-REACTIVE PROTEIN; CRP, SERUM (Immunoturbidimetry)	< 0.50	mg/L	<6.00

Comments

CRP is an acute phase reactant which is used in inflammatory disorders for monitoring course and effect of therapy. It is most useful as an indicator of activity in Rheumatoid arthritis, Rheumatic fever, tissue injury or necrosis and infections. As compared to ESR, CRP shows an earlier rise in inflammatory disorders which begins in 4-6 hrs, the intensity of the rise being higher than ESR and the recovery being earlier than ESR. Unlike ESR, CRP levels are not influenced by hematologic conditions like Anemia, Polycythemia etc.

HOMOCYSTEINE, QUANTITATIVE, SERUM * (Chemiluminescent Microparticle Immunoassay)	**14.00**	umol/L	3.70 - 13.90

Comments

Homocysteine is a sulphur containing amino acid. There is an association between elevated levels of circulating homocysteine and various vascular and cardiovascular disorders. Clinically the measurement of

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homocysteine is considered important to diagnose homocystinuria, to identify individuals with or at risk of developing cobalamin or folate deficiency & to assess risk factor for Cardiovascular Disease (CVD) for which the recommendations are:

- Specially useful in young CVD patients (< 40 yrs)
- In known cases of CVD, high homocysteine levels should be used as a prognostic marker for CVD events and mortality
- CVD patients with homocysteine levels > 15 umol/L belong to a high risk group
- Increased homocysteine levels with low vitamin concentrations should be handled as a potential vitamin deficiency case.

IMMUNOGLOBULIN PROFILE, SERUM @
(Immunoturbidimetry)

Immunogloublin IgG, Serum	771.00	mg/dL	700.00 - 1600.00
Immunogloublin IgM, Serum	95.60	mg/dL	40.00 - 230.00
Immunogloublin IgA, Serum	**534.20**	mg/dL	70.00 - 400.00

Comments:

Approximately 80% of serum immunoglobulin is IgG, 6% is IgM and 13% is IgA. High levels of IgM signify acute infections whereas IgG predominates in chronic infections. IgA is the predominant immunoglobulin in body secretions like saliva, sweat and colostrums.

Polyclonal increases are seen in:

IgG: SLE, Chronic liver diseases, Infectious diseases and Cystic fibrosis
IgM: Viral, bacterial and parasitic infections, Liver diseases, Rheumatoid arthritis, Scleroderma, Cystic fibrosis & heroin addiction
IgA: Chronic liver diseases, Chronic infections, Autoimmune disorders, Sarcoidosis and Wiscott-Aldrich syndrome.

Monoclonal increases are seen in IgG & IgA Myelomas and IgM increases in cases of Waldenstroms macroglobulinemia

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Decreased synthesis of IgG, IgM & IgA is seen in Congenital and Acquired Immunodeficiency diseases.

Decreased levels are seen in Protein losing enteropathies, Nephrotic syndrome and skin burns.

PROLACTIN, SERUM (Chemiluminescent Immunoassay)	44.73	ng/mL	

Interpretation

REFERENCE GROUP	REFERENCE RANGE IN ng/mL
Tanner Stage 1(<9.2 yrs)	3.1-18.7
Tanner Stage 2(9.2-13.7 yrs)	3.7-21.8
Tanner Stage 3(10-14.4 yrs)	4.0-18.2
Tanner Stage 4(10.7-15.6 yrs)	4.0-20.8
Tanner Stage 5(11.8-18.6 yrs)	4.3-24.9
Adult Females	
Non Pregnant	2.80 - 29.20
Pregnant	9.70 - 208.50
Post Menopausal	1.80 - 20.30

Note

1. Since prolactin is secreted in a pulsatile manner and is also influenced by a variety of physiologic stimuli, it is recommended to test 3 specimens at 20-30 minute intervals after pooling.
2. Major circulating form of Prolactin is a nonglycosylated monomer, but several forms of Prolactin linked with immunoglobulin occur which can give falsely high Prolactin results.
3. Macroprolactin assay is recommended if prolactin levels are elevated, but signs and symptoms of hyperprolactinemia are absent or pituitary imaging studies are normal

Clinical Use

- Diagnosis & management of pituitary adenomas
- Differential diagnosis of male & female hypogonadism

Increased Levels

- **Physiologic:** Sleep, stress, postprandially, pain, coitus, pregnancy, nipple stimulation or nursing

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Test Name	Results	Units	Bio. Ref. Interval

- **Systemic disorders:** Chest wall or thoracic spinal cord lesions, Primary / Secondary hypothyroidism, Adrenal insufficiency, Chronic renal failure, Cirrhosis
- **Medications:**
  - **Psychiatric medications** like Phenothiazine, Haloperidol, Risperidone, Domperidone, Fluoexetine, Amitriptylene, MAO inhibitors etc.,
  - **Antihypertensives:** Alphamethyldopa, Reserpine, Verapamil
  - **Opiates:** Heroin, Methadone, Morphine, Apomorphine
  - **Estrogens**
  - **Oral contraceptives**
  - **Cimetidine / Ranitidine**
- **Prolactin secreting pituitary tumors:** Prolactinoma, Acromegaly
- **Miscellaneous**: Polycystic ovarian disease, Epileptic seizures, Ectopic secretion of prolactin by non-pituitary tumors, pressure / transaction of pituitary stalk, macroprolactinemia
- **Idiopathic**

Decreased levels

- Pituitary deficiency: Pituitary necrosis / infarction
- Bromocriptine administration
- Pseudohypoparathyroidism

Dr Anil Arora
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HOD Hematology & Immunohematology
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Dr Sunanda
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----------End of report ----------

* Not in NABL scope

A28 - MR. MANINDAR SINGH - ANVI
COLLECTION CENTRE, SIRSA
SANJEEV MARKET, SIRSA, NEAR HANUMAN TEMPLE, G.B. NAGAR, UP

Name	: Mrs. MADHU JAIN			Collected	: 22/3/2021 10:44:00AM
Lab No.	: 305816504	Age: 61 Years	Gender: Female	Received	: 22/3/2021 2:08:00PM
				Reported	: 23/3/2021 9:06:55PM
A/c Status	: P	Ref By : SELF		Report Status	: Final

Test Name	Results	Units	Bio. Ref. Interval

IMPORTANT INSTRUCTIONS

*Test results released pertain to the specimen submitted.*All test results are dependent on the quality of the sample received by the Laboratory. *Laboratory investigations are only a tool to facilitate in arriving at a diagnosis and should be clinically correlated by the Referring Physician .*Sample repeats are accepted on request of Referring Physician within 7 days post reporting.*Report delivery may be delayed due to unforeseen circumstances. Inconvenience is regretted.*Certain tests may require further testing at additional cost for derivation of exact value. Kindly submit request within 72 hours post reporting.*Test results may show interlaboratory variations.*The Courts/Forum at Delhi shall have exclusive jurisdiction in all disputes/claims concerning the test(s) & or results of test(s).*Test results are not valid for medico legal purposes. *Contact customer care Tel No. +91-11-39885050 for all queries related to test results.
(#) Sample drawn from outside source.

* Not in NABL scope