Mrs. Prema Nair
1705,Alpine, building no1. Regency Anantham,Vicco Naka,Dombivli..
Tel No : 9167260019
PIN No: 421203
PID NO: P83424524978688
Age: 52 Year(s) Sex: Female

240109102083349

Reference: DR.RAHUL KARANDIKAR

Sample Collected At:
Dombivali East Cc Mhl
Shop No 9 Ground Floor,s K Pride Chs Ltd,asade Golavi Regancy Estate,kalyan Shill Road Dombivli East-421202.Zone: Bhiwandi Ambadi
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CBC Haemogram

Investigation	Observed Value	Unit	Biological Reference Interval
Erythrocytes			
Haemoglobin (Hb)	12.9	gm/dL	12.0-16
Erythrocyte (RBC) Count	4.58	mill/cu.mm	4.2-5.4
PCV (Packed Cell Volume)	40.4	%	37-47
MCV (Mean Corpuscular Volume)	88.2	fL	82-101
MCH (Mean Corpuscular Hb)	28.2	pg	27-34
MCHC (Mean Corpuscular Hb Concn.)	31.9	g/dL	31.5-36
RDW (Red Cell Distribution Width)	12.7	%	11.5-14.0
RBC Morphology			
Remark	Normocytic Normochromic		
Leucocytes			
Total Leucocytes (WBC) count	4,780	cells/cu.mm	4300-10300
Absolute Neutrophils Count	2729	/c.mm	2000-7000
Absolute Lymphocyte Count	1568	/c.mm	1000-3000
Absolute Monocyte Count	339	/c.mm	200-1000
Absolute Eosinophil Count	129	/c.mm	20-500
Absolute Basophil Count	**14**	/c.mm	20-100
Neutrophils	57.1	%	40-80
Lymphocytes	32.8	%	20-40
Monocytes	7.1	%	2.0-10
Eosinophils	2.7	%	1-6
Basophils	0.3	%	0-2
Platelets			
Platelet count	239	10^3 / µl	140-440
MPV (Mean Platelet Volume)	8.9	fL	7.8-11
PCT (Platelet Haematocrit)	0.212	%	0.2-0.5
PDW (Platelet Distribution Width)	11.8	%	9-17

EDTA Whole Blood - Tests done on Automated Five Part Cell Counter. (WBC, RBC Platelet count by impedance method, WBC differential by VCS technology other parameters calculated) All Abnormal Haemograms are reviewed confirmed microscopically. Differential count is based on approximately 10,000 cells.

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Investigation	Observed Value	Unit	Biological Reference Interval
TruHealth Vital Plus			
Glucose fasting (Plasma-F,Hexokinase)	84	mg/dL	Normal: 70-99 Impaired Fasting Glucose(IFG): 100-125 Diabetes mellitus: >= 126 (on more than one occassion) (American diabetes association guidelines 2022)

Note: An individual may show higher fasting glucose level in comparison to post prandial glucose level due to following reasons : The glycaemic index and response to food consumed, Changes in body composition, Increased insulin response and sensitivity, Alimentary hypoglycemia, Renal glycosuria, Effect of oral hypoglycaemics & Insulin treatment.

Associated Tests: HbA1c (H0018), Diabetes Profile – Maxi (D0021),HOMA Index (H0275), Insulin (I0275).

BilirubinTotal, Direct, IndirectSerum			
Bilirubin-Total (Serum,Diazo)	0.61	mg/dL	0-1.2 Change in Reference range
Bilirubin-Direct (Serum,Diazo)	**0.35**	mg/dL	0-0.3
Bilirubin- Indirect (Serum,Calculated)	0.26	mg/dL	0.1-1.0
Proteins			
Total Protein (Serum,Biuret)	7.43	g/dL	6.4-8.3
Albumin (Serum,Bromocresol green)	4.38	g/dL	3.5-5.2
Globulin (Serum,Calculated)	3.05	g/dL	1.8-3.6
A/G Ratio (Serum,Calculated)	1.4		1.1-2.2
SGPT (ALT) (Serum,Enzymatic)	19	U/L	0-34
SGOT (AST) (Serum,Enzymatic)	24	U/L	0-31
Alkaline Phosphatase (Serum,pNPP)	101	U/L	40-150
Albumin (Serum,Bromocresol green)	4.38	g/dL	3.5-5.2
Creatinine (Serum,Jaffe)	0.68	mg/dL	0.60-1.10 Note : Change in Reference range
BUN-Blood Urea Nitrogen (Serum,Urease)	**8.5**	mg/dL	9-20.1

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Investigation	Observed Value	Unit	Biological Reference Interval

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.

Sodium (Serum,ISE)	139	mmol/L	136-145

Interpretation:

- **Low levels** are noted in prolonged vomiting or diarrhea, diminished reabsorption in the kidney and excessive fluid retention. **High levels** are seen in case of excessive fluid loss, high salt intake and increased kidney reabsorption.

Potassium (Serum,ISE)	4.59	mmol/L	3.5-5.1

Interpretation:

- **Low levels** are noted in reduced intake of dietary potassium or excessive loss of potassium from the body due to diarrhea, prolonged vomiting or increased renal excretion. **High levels** may be caused by dehydration or shock, severe burns, hemolysis, diabetic ketoacidosis, and retention of potassium by the kidney.

Chlorides (Serum,ISE)	100	mmol/L	98-107

Interpretation:

- **Low levels** are noted in reduced dietary intake, prolonged vomiting and reduced renal reabsorption as well as some forms of acidosis and alkalosis. **High levels** are found in dehydration, kidney failure, some forms of acidosis, high dietary or parenteral chloride intake, and salicylate poisoning.

Uric Acid (Serum,Uricase)	5.7	mg/dL	2.6-6
Phosphorous (Serum,Phospomolybdate)	4.1	mg/dL	2.3-4.7
Calcium (Serum,Arsenazo III dye)	9.1	mg/dL	8.4-10.2
Free T3 (Serum,ECLIA)	3.08	pg/mL	2.0-4.4 First Trimester :2.46 - 3.49 Second Trimester : 2.09 - 3.55 Third trimester : 2.01 - 3.27

Interpretation :

Total T3 & T4 values may also be altered in other conditions due to changes in serum proteins or binding sites Pregnancy, Drugs (Androgens,Estrogens, O C Pills ,Phenytoin), Nephrosis etc. In such cases Free T3 and Free T4 give corrected values.

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Investigation	Observed Value	Unit	Biological Reference Interval
Free T4 (Serum,ECLIA)	1.46	ng/dL	0.93-1.7 First Trimester : 0.7-2.0 Second Trimester : 0.5-1.6 Third Trimester : 0.5-1.6

Interpretation :

Total T3 & T4 values may also be altered in other conditions due to changes in serum proteins or binding sites Pregnancy, Drugs (Androgens,Estrogens, O C Pills ,Phenytoin), Nephrosis etc. In such cases Free T3 and Free T4 give corrected values.

TSH(Ultrasensitive) (Serum,ECLIA)	1.070	µIU/mL	0.54-5.3 First Trimester : 0.33-4.59 Second Trimester : 0.35-4.10 Third trimester : 0.21-3.15

Interpretation :

- Increased TSH is seen with intake of Iodine, Lithium, Amiodarone drugs and also indicates considerable physiologic & seasonal variation.
- Decreased TSH values require correlation with patient age & clinical symptoms and seen with intake of few drugs e.g. L-dopa, glucocorticoids.
- Transient alteration in TSH is seen in non-thyroidal illness like severe infections, liver disease, renal and heart failure, severe burns, trauma and surgery etc.

Clinical Utility: Levels of TSH are used for monitoring of thyroid related disorders.

Caution: Patients on Biotin supplement may have interference in some immunoassays. For sample collection, at least 8-hours wait time is recommended for individuals taking high dose of Biotin (more than 5 mg per day) supplements.

Note: TSH levels may fluctuate based on few factors such as pregnancy, illness and age. Also, time of sample collection, technologies used to analyze the test, usage of certain drugs, diet may have impact on TSH levels. TSH may show around 50% variation even when done at different times of day due to its association with circadian rhythm.

Associated Tests: T3 (T0029), T4 (T0031) free T3 (T0028), free T4 (T0030), reverse T3 (R1004), Thyroid Antibodies (T0061), Thyroid Comprehensive Profile-1 (T0062)

Reference:

- Clinical Chemistry 50:12, 2338-2344 (2004) and Ind J Clin Biochem (Apr-June 2014) 29(2):189–195.
- Ref: Arch Pathol Lab Med—Vol 141, November 2017.
- Fisher DA. Physiological variations in thyroid hormones: physiological and pathophysiological considerations. Clin Chem. 1996 Jan;42(1):135-9. PMID: 8565215

Vitamin B12 level (Serum,ECLIA)	460.00	pg/mL	197-771

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Investigation	Observed Value	Unit	Biological Reference Interval

Interpretation :

1. Vit B12 levels are decreased in megaloblastic anemia, partial/total gastrectomy, pernicious anemia, peripheral neuropathies, chronic alcoholism, senile dementia, and treated epilepsy.
2. An associated increase in homocysteine levels is an independent risk marker for cardiovascular disease and deep vein thrombosis.
3. Holo Transcobalamin II levels are a more accurate marker of active VitB12 component.

Caution:

- Patients on Biotin supplement may have interference in some immunoassays. With individuals taking high dose Biotin (more than 5 mg per day) supplements, at least 8-hour wait time before blood draw is recommended.

Disclaimer:

- High levels of Vitamin B12 may be due to exogenous supplementation. Kindly correlate clinically.

Associated Tests

- Active Vitamin B12 (V0012), Homocysteine reflex Vitamin B12-folate serum (H0310), Homocysteine Serum (H0254),RBC Folate R0007.

Reference:

1. Package insert
2. Arch Pathol Lab Med—Vol 141, November 2017

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Investigation	Observed Value	Unit	Biological Reference Interval
ESR - Erythrocyte Sedimentation Rate (EDTA Whole Blood)	**47**	mm/hr	0-20

Method: Automated Westergren

Interpretation:

1. It indicates presence and intensity of an inflammatory process, never diagnostic of a specific disease. Changes are more significant than a single abnormal test.
2. It is a prognostic test and used to monitor the course or response to treatment of diseases like tuberculosis, bacterial endocarditis, acute rheumatic fever, rheumatoid arthritis, SLE, Hodgkins disease, temporal arteritis, polymyalgia rheumatica.
3. It is also increased in pregnancy, multiple myeloma, menstruation, and hypothyroidism.

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Investigation	Observed Value	Unit	Biological Reference Interval
25 Hydroxy (OH) Vit D (Serum,ECLIA)	52.10	ng/mL	Deficiency: < 10 Insufficiency: 10-30 Sufficiency: 30-100 Hypervitaminosis: > 100

Interpretation:

- Vitamin D is a fat soluble vitamin and exists in two main forms as D3 & D2. Both are converted to 25(OH) vitamin D in liver.
- For diagnosis of vitamin D deficiency, it is recommended to have clinical correlation with serum 25(OH)vitamin D, serum calcium, serum iPTH & serum alkaline phosphatase
- During monitoring of oral vitamin D therapy- suggested testing of serum 25(OH) vitamin D is after 12 weeks or 3 months of treatment.

Caution:

- Patients on Biotin supplement may have interference in some immunoassays. With individuals taking high dose Biotin (more than 5 mg per day) supplements, at least 8-hour wait time before blood draw is recommended.

Disclaimer:

- The required dosage of vitamin D supplements & time to achieve sufficient vitamin D levels show significant seasonal (especially winter) & individual variability depending on age, body fat, sun exposure, physical activity, genetic factors (especially variable vitamin D receptor responses), associated liver or renal diseases, malabsorption syndromes and calcium or magnesium deficiency.
- Vitamin D toxicity is known but very rare. Kindly correlate clinically, repeat with fresh sample if indicated.

Associated Tests:

- iPTH-Intact Molecule Parathyroid hormone Serum/Plasma (P0114), Calcium(C0017), Vitamin D plus profile(V0016)

Reference:

1. Package insert
2. Arch Pathol Lab Med—Vol 141, November 2017

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Investigation	Observed Value	Unit	Biological Reference Interval
Lipid Profile-2 (Serum,Enzymatic)			
Cholesterol-Total	185	mg/dL	Desirable: < 200 Borderline High: 200-239 High: >= 240
Triglycerides level	91	mg/dL	Normal: < 150 Borderline High: 150-199 High: 200-499 Very High: >= 500
HDL Cholesterol	52	mg/dL	Major risk factor for heart disease: < 40 Negative risk factor for heart disease: >= 60
Non HDL Cholesterol	**133.5**	mg/dL	Optimal: < 130 Desirable: 130-159 Borderline high: 159-189 High: 189-220 Very High: >= 220
LDL Cholesterol	**115.4**	mg/dL	Optimal: < 100 Near Optimal: 100-129 Borderline high: 130-159 High: 160-189 Very High: >= 190
VLDL Cholesterol	18.10	mg/dL	6-38
LDL/HDL RATIO	**2.2**		2.5-3.5
CHOL/HDL RATIO	3.59		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

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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/ turbo 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.

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