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MEDICAL LABORATORY

BML472717

Laboratory Investigation Report

Name	:	Ms. SHAKKIRA ABOOBACKER	**Ref No.**	:	40368
DOB	:	24/08/1995	**Sample No.**	:	2410483183
Age / Gender	:	29 Y 1 M / Female	**Collected**	:	02/10/2024 08:30
Referred by	:	CITICARE MEDICAL CENTER	**Registered**	:	02/10/2024 15:23
Centre	:	CITICARE MEDICAL CENTER	**Reported**	:	02/10/2024 19:15

BIOCHEMISTRY

Test	Result	Flag	Unit	Reference Range	Methodology
HOMA IR (HOMEOSTASIS MODEL ASSESSMENT INSULIN RESISTANCE)					
Beta cell function	238.8		%		
Insulin sensitivity	15.0		%		
HOMA IR index	**6.67**	**H**		> 2.5 cutoff indicates insulin resistance.	
Glucose fasting	**112**	**H**	mg/dL	Normal: < 100	Hexokinase
Insulin (Fasting)	**52.9**	**H**	uIU/mL	Fasting: 6-27	CLIA

Comments : Please correlate clinically.

INTERPRETATION NOTES :

Test Description :

- The HOMA model is used to yield an estimate of insulin sensitivity and beta-cell function from fasting plasma insulin and glucose concentrations.
- Insulin resistance is a state in which normal concentrations of insulin produce a subnormal biologic response

Uses Of HOMA Values :

- To assess the risk of development of diabetes. It allows assessment of inherent beta cell function and insulin sensitivity and characterizes the pathophysiology in those with abnormal glucose tolerance.
- It can be used to assess response to diet or oral drug therapy.

Test Interpretation :

HOMA2-IR value of 2.5 is taken as an indicator of insulin resistance in adolescents & adults which provides maximum sensitivity & specificity in diagnosing metabolic syndrome in both genders & as per ATP III(Adult Treatment Panel) & IDF(International Diabetes Federation) criteria

Remarks :

- Insulin glucose HOMA model cannot be used in those taking exogenous insulin. Under such circumstances, the C peptide HOMA model which uses C peptide to reflect endogenous insulin secretions could be used.
- The HOMA-IR calculator version 2.2 accepts values in the following approved ranges only, plasma insulin (2.9 -57.6 uU/ml) & blood sugar fasting (54.1-450.5 mg/dl). HOMA-IR calculation not possible if values are outside these ranges, clinical correlation suggested.

References :

- Current approaches for assessing insulin sensitivity and resistance in vivo: advantages, limitations, and appropriate usage Muniyappa R et al. Am J Physiol Endocrinol Metab 2008;294:15-26.
- A Study of Insulin Resistance by HOMA-IR and its Cut-off Value to Identify Metabolic Syndrome in Urban Indian Adolescents. Yashpal Singh et al. J Clin Res Pediatr Endocrinol 2013;5(4):245-251

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Interpretation for insulin

1. Levels are increased in insulinomas, factitious hypoglycemia, insulin autoimmmune syndrome, acromegaly (after ingestion of glucose), Cushings syndrome, corticosteroid administration and levodopa usage.
2. Levels are depressed to absent in diabetes mellitus, pituitary tumors, and chronic pancreatic diseases i.e. cystic fibrosis.
3. Insulin/ C-peptide ratio is used for differentiating between factitious hypoglycemia and insulinomas where a ratio< 1.0 indicates insulinoma, but results may vary in renal failure.
4. Antibodies to insulin form in longstanding diabetes mellitus treated with insulin hence in these patients monitoring insulin levels gives a better prognosis.

Sample Type : *Serum; Fluoride plasma*

End of Report

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IMMUNOLOGY

Test	Result	Flag	Unit	Reference Range	Methodology
BETA 2 GLYCOPROTEIN 1 IGG ANTIBODY	3.27		U/mL	Negative: < or = 5 Borderline: > 5 to < 8 Positive: ≥ 8 Please note change in unit, reference range and method. Source: Virclia IFU.	CLIA

INTERPRETATION NOTES :

Antibodies against β2-glycoprotein I belong to the group of anti- phospholipid antibodies mainly targeted against complexes composed of negatively charged phospholipids (e.g. cardiolipin) and plasma proteins like β2-glycoprotein I, prothrombin, protein C or protein S.

Many studies have shown a correlation between these autoantibodies and an enhanced incidence of thrombosis, thrombocytopenia and habituall abortions (as a consequence of placental infarction). The exact mechanism by which pathogenic anti-phospholipid antibodies induce thrombosis has not yet been revealed.

Reference: Kit IFU.

BETA 2 GLYCOPROTEIN 1 IGM ANTIBODY	<=1		U/mL	Negative :< or = 5 Borderline :> 5 to 8 Positive: > 8 Please note change in unit,reference range and method.	CLIA

INTERPRETATION NOTES :

Antiphospholipid antibodies(APA) are important in the etiology of recurrent thrombosis & pregnancy loss in patients with Antiphospholipid antibody syndrome(APS).APA are directed to the binding protein itself, or to a combination of the binding protein and negatively charged phospholipids. Beta-2-glycoprotein I (apolipoprotein H) is one of the plasma binding proteins useful in regulating the intrinsic coagulation pathway.The anti-ß2GPI assay shows higher specificity than anti cardiolipin antibodies for APS diagnosis as in 3-10% of APS patients, anti-ß2GPI may be the only test positive. Hence, IgG and IgM anti-ß2GPI are considered as an independent risk factor for thrombosis and pregnancy complications. Persistent positive test spaced at least 12 weeks apart is significant for APS diagnosis.

CARDIOLIPIN IGG ANTIBODY^	Conc <=1		GPL-U/mL	Negative: <7 Borderline: 7-9 Positive: >9 Please note change in unit, method and reference range. Source: Vircell IFU.	CLIA

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IMMUNOLOGY

Test	Result	Flag	Unit	Reference Range	Methodology
CARDIOLIPIN IGM ANTIBODY	Conc <=1		MPL-U/mL	Negative: < or = 7 Borderline: 7 - 9 Positive: > or = 9	CLIA

Sample Type : Serum

End of Report

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MOLECULAR BIOLOGY

Test	Result	Flag	Unit	Reference Range	Methodology
# FACTOR V LEIDEN MUTATION	NEGATIVE				Real time PCR

INTERPRETATION NOTES :

Equipment: Rotor Gene 3000 from Corbett Research, Australia

Result Interpretation:

• A "Positive" result indicates presence of Homozygous Mutation or Heterozygous Mutation.

• A "Negative" result indicates absence of Mutation.

Clinical Background:

• Factor V Leiden mutation is associated with increased risk for thrombosis and accounts for >90% of cases with Activated protein C (APC) resistance.

• Individuals tested positive for Factor V Leiden mutation need to be advised of the risk of thrombotic events for other family members.

Clinical Utility:

• An individual with unprovoked venous thromboembolism (VTE) before the age of 50. An individual with VTE at any age in an individual with a first-degree relative with VTE before age 50.

• An individual with recurrent VTE.

• An individual with VTE at an unusual site (cerebral, mesenteric, portal, or hepatic veins).

Limitation of Assay:

PCR is a highly sensitive technique; common reasons for paradoxical results are contamination during specimen collection, selection of inappropriate specimen and inherent PCR inhibitors in the sample.

Reference:

• Reitter-Pfoertner S., 2012 Nov 22; 109(1).

• Gaunt TR, Eur J Hum Genet. 2012 Nov 28. doi: 10.1038/ejhg.2012.242.

• American Journal of Pathology (1997); 108-427-433

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MOLECULAR BIOLOGY

Test	Result	Flag	Unit	Reference Range	Methodology

This test is performed in an accredited referral laboratory.

Sample Type : *EDTA Whole Blood*

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Centre	:	CITICARE MEDICAL CENTER	**Reported**	:	05/10/2024 20:51

HAEMATOLOGY

Test	Result	Flag	Unit	Reference Range	Methodology
LUPUS ANTICOAGULANTS (LAC)					
aPTT & aPTT MIXING STUDIES					
aPTT (Test) - LS	36.7		sec	35.08 - 43.81	Clot Based
aPTT-Control	33.40		sec	--	Clot Based
DRVV SCREEN					
DRVV Screen (Test)	**29.40**	**L**	sec	32.5 - 45.86	Clot Based
DRVV Screen Control	38.30		sec	--	Clot Based
DRVV Screen Ratio	**0.77**	**L**		0.85 - 1.20	Clot Based
LUPUS ANTICOAGULANT					
LUPUS ANTICOAGULANT	Absent			Absent	Clot Based

INTERPRETATION NOTES :

Test Description :

Screening of Lupus Anticoagulant Confirmation is done by two different APTT reagents namely Lupus sensitive (LS) APTT Automate and RVVT. Lupus anticoagulant is an antiphospholipid antibody directed against negatively charged phospholipids that is identified functionally by prolongation of in vitro phospholipids dependent coagulation test. Lupus anticoagulant is often associated with a thrombotic tendency and clinical states such as Autoimmune Disease (SLE), recurrent abortion, infection. Their presence may be persistent or transiting.

Interpretation :

1. 1. Following is the final Interpretative Table using the findings of both the above mentioned tests:

APTT (LS)	APTT Mixing (Using Rosner Index)	DRVVT (Screen)	DRVVT (Confirmation)	Normalized ratio ie = DRVVT screen to confirmation ratio	Interpretation
Normal	-	Normal	-	-	LAC Absent
Abnormal	Corrected	Normal	-	-	Suspect Factor Deficiency
Abnormal	Not Corrected	Abnormal	Normal	>1.2	LAC Present
Normal	-	Abnormal	Normal	>1.2	LAC Present
Abnormal	Corrected/ Partially Corrected	Abnormal	Normal	>1.2	Factor Deficiency + LAC Present
Abnormal	Not Corrected	Abnormal	Abnormal	<1.2	Either Inhibitor or LAC
Abnormal	Not Corrected	Normal	-	-	Suspect Inhibitor/heparin

2. Interpretation of APTT mixing based on Rosner Index (RI)

Rosner Index = Clotting time of mixture - Clotting time of normal (PPP) X 100/Clotting time of patient plasma

* If Rosner Index < 12 then APTT mixing is considered as corrected and Suspects the factor deficiency.

* If Rosner Index > 12 then APTT mixing is considered as not corrected and Suspects the presence of inhibitor or Lupus.

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3. All abnormal results of DRVV screening tests are confirmed by neutralization assay using Phospholipids. A normalized ratio > or = Biological Reference Interval confirms the presence of lupus anticoagulant (LAC).
4. Persistent Positive LAC results on two different occasions & 12 weeks apart are essential to suspect & diagnose Lupus anticoagulant. The result is to be interpreted according to the patients clinical and biological states.
5. In view of abnormal DRVV Screen, abnormal DRVV confirm and normalised ration <2, possibility of Lupus and/or Inhibitor needs exclusion. Advice repeat testing after 12 weeks.

Limitations :

1. False Positive: Patients on heparin or heparin substitute; Coagulation factor VIII inhibitors.
2. False Negative: Elevated factor VIII levels, as may be seen in an acute infection or with replacement therapy when someone has Hemophillia A, may shorten the aPTT time, leading to a temporary false negative test for lupus anticoagulant.

Reference : Update of the guidelines for lupus anticoagulant detection. Pengo V, Tripodi A, et al. J Thromb Haemost 2009; 7: 1737–40.

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Sample Type : *Citrated Plasma*

End of Report

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HAEMATOLOGY

Test	Result	Flag	Unit	Reference Range	Methodology
PROTEIN C ACTIVITY	97.3		%	70 - 140 Please note change in reference range. (Source: Kit literature). First Trimester: 78 - 121 Second Trimester: 83 - 133 Third Trimester: 67 - 135	Chromogenic Assay

INTERPRETATION NOTES :

Interpretation:
Protein C is a major physiological anticoagulant The activated form (with protein S as a cofactor) degrades Factor Va and Factor VIIIa. An inherited decrease in protein C increases the patients risk for venous thromboembolism.
1. Artifactually decreased functional protein C values may be seen in patients with abnormally elevated levels of factor VIII.
2. Artifactually increased levels of functional protein C values may be seen in patients on heparin therapy.
3. Patients on oral anticoagulants will have decreased functional protein C values. Patients should be off oral anticoagulant therapy for two weeks for accurate measurement of functional protein C levels.

PROTEIN S ACTIVITY	70.3		%	60.0 - 135.8 Please note change in reference range (Source: Kit literature). First Trimester : 57-95 Second Trimester : 42-68 Third Trimester : 16-42	Clotting

Sample Type : *Citrated Plasma*

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