LABORATORY REPORT

Redcliffe labs

Patient NAME	**: Mr Dummy - PL259B**		
DOB/Age/Gender	: 25 Y/Male	Report STATUS	: Final Report
Patient ID / UHID	: 10646189/OF10646189	Barcode NO	: ZF558213
Referred BY	: Self	Sample Type	: Serum
Sample Collected	: Dec 03, 2024, 03:22 PM	Report Date	: Dec 03, 2024, 05:14 PM.

Test Description	Value(s)	Unit(s)	Reference Range

Male Hormone Profile- Advanced

TSH 3rd Generation

Thyroid Stimulating Hormone (Ultrasensitive) *Chemiluminescence Immuno Assay (CLIA)*	3.21	µIU/mL	0.4 - 4.2

Interpretation:

Pregnancy	Reference ranges TSH
1 st Trimester	0.1 - 2.5
2 ed Trimester	0.2 - 3.0
3 rd Trimester	0.3 - 3.0

Note:
TSH levels are subject to circadian variation, reaching peak levels between 2-4 am. and at a minimum between 6-10 pm. The variation is of 50 %, hence time of the day has influence on the measured serum TSH concentrations.

Clinical Use:
- Diagnose Hypothyroidism and Hyperthyroidism
- Monitor T4 replacement or T4 suppressive therapy
- Qunatify TSH levels in the subnormal range

Increased Levels : Primary hypothyroidism, Subclinical hypothyroidis, TSH dependent Hyperthyroidism, Thyroid hormone resistance
Decreased Levels: Grace disease, Autonomous thyroid hormone secretion, TSH deficiency

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Test Description	Value(s)	Unit(s)	Reference Range
Prolactin (PRL)			
Prolactin *ECLIA*	9.35	ng/mL	Men 4.04 - 15.2 Women(Not-pregnant)4.79 - 23.3

Interpretation:

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
· **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

Cimetidine / Ranitidine

· Prolactin secreting pituitary tumors: Prolactinoma, Acromegaly
· Miscellaneous: 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

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Androgen Index

Test Description	Value(s)	Unit(s)	Reference Range
Testosterone Total *CLIA*	371	ng/dL	249 - 836
SEX HORMONE BINDING GLOBULIN (SHBG),SERUM *CLIA*	25.0	nmol/L	Male (20-49 years) 18.3 - 54.1 Male (>=50years) 20.6 - 76.7
Free Androgen Index (FAI) *Calculated*	51.48		30 - 128

Interpretation:

Testosterone Total:

1. Testosterone is the major androgenic hormone. It is responsible for the development of the male external genitalia and secondary sexual characteristics. In females, its main role is as an estrogen precursor. In both genders, it also exerts anabolic effects and influences behavior.
2. Testing is useful in males for: Evaluation of symptoms or signs of possible hypogonadism, delayed or precocious puberty, Monitoring testosterone replacement or antiandrogen therapy.
3. Testing is useful in females for: Evaluation of symptoms or signs of hirsutism, virilization, and oligo-amenorrhea, possible testosterone deficiency, diagnosis of androgen-secreting tumors, evaluation of infants with ambiguous genitalia or virilization.

SEX HORMONE BINDING GLOBULIN (SHBG):

1. SHBG is important transport protein for estrogens and androgens in peripheral blood. SHBG concentration is a major factor regulating their distribution between the protein-bound and free states.
2. SHBG concentration in plasma is regulated by androgen/estrogen balance, thyroid hormones, insulin and dietary factors.
3. Plasma SHBG concentrations are affected by many different medical conditions.

A. High values being found in hyperthyroidism, hypogonadism, androgen insensitivity and hepatic cirrhosis in men.

B. Low concentrations are found in myxoedema, hyperprolactinaemia and syndromes of excessive androgen activity.

4. Measurement of SHBG along with Free Androgen index (FAI), which is ratio of testosterone to SHBG helps in identifying excessive androgen activity & useful in the evaluation of mild disorders of androgen metabolism.

Free Androgen Index (FAI)

The testosterone in blood can be found under three forms: tightly bound to SHBG, weakly bound to albumin and only a small percentage (<3% in males and <0.7% in females) unbound. This third form is the free testosterone, the only form capable of binding to tissue receptors to exert its effects, hence why it makes for the best marker of androgen status. FAI was found in statistical analysis to be a poor predictor of bioavailable testosterone. FAI should not be used in isolation and is often accompanied by other measured or estimated parameters such as gonadotropin levels.Because SHBG is present in such large excess in women (10–100:1), free testosterone concentrations are driven primarily by SHBG abundance. In addition, testosterone excess in women lowers SHBG concentrations, which raises the free testosterone concentration and contributes to the strong correlation of 1/SHBG with free testosterone.Typical FAI healthy values range from 30 to 150 in adult men and 7 to 10 in adult women. In men, values below 30 are cause for concern and could contribute to erectile dysfunction whilst in women, higher values are cause for concern and could contribute to polycystic ovary syndrome and hirsutism.

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HOMA-IR.

Test Description	Value(s)	Unit(s)	Reference Range
GLUCOSE FASTING *Plasma, Hexokinase*	88.0	mg/dL	<100
Insulin (Fasting) *ECLIA*	8.9	µU/mL	2.6 - 24.9
HOMA IR Index *Calculated*	1.9		<2.5

Interpretation:
1. The HOMA model is used to yield an estimate of insulin sensitivity and beta cell function from fasting plasma insulin and glucose concentrations.
2. Insulin resistance is a state in which normal concentrations of insulin produce a subnormal biologic response.
3. Levels of Insulin are increased in insulinomas, factitious hypoglycemia, insulin autoimmmune syndrome, acromegaly (after ingestion of glucose), Cushings syndrome, corticosteroid administration and levodopa usage.
4. Levels of Insulin are depressed to absent in diabetes mellitus, pituitary tumors and chronic pancreatic diseases i.e. cystic fibrosis. 5. 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.
6. Antibodies to insulin form in longstanding diabetes mellitus treated with insulin hence in these patients monitoring insulin levels gives better prognosis.

Uses of HOMA Values:
1. 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.
2. It can be used to assess response to diet or oral drug therapy.

Remarks:
1. 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.

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LH / FSH Ratio

Test Description	Value(s)	Unit(s)	Reference Range
Luteinising Hormone-LH *CMIA*	2.37	mIU/mL	Normal Males - 0.57 - 12.07
Follicle Stimulating Hormone-FSH *CMIA*	1.31	mIU/mL	Males 0.95 - 11.95
LH / FSH Ratio	1.81		

Interpretation:
1. Ratio of LH to FSH > 2.50 indicates the presence of PCOS.
2.Polycystic Ovary Syndrome (PCOS) is a complex syndrome and each of the clinical phenotype is associated with different patterns of steroid hormones. It is likely that simultaneous measurement of multiple androgens (steroid/androgen profiling with highly specific and sensitive method LC-MS/MS) be more sensitive for detecting PCOS-related androgen excess and for predicting metabolic risk.
3.Women with Non-classical Congenital Adrenal Hyperplasia (NC-CAH) due to 21-hydroxylase deficiency and women with PCOS have similar clinical presentation, with hyperandrogenism, oligomenorrhea, and polycystic ovaries. The screening tool to distinguish NC-CAH from PCOS is the basal 17-OHP levels and the ACTH stimulation test.

Comments:
Polycystic Ovarian Syndrome (PCOS) affects 5-10% of women of reproductive age, making it the most common endocrine disorder of women in this age group. It is characterized by amenorrhea, hirsuitism and infertility. It is caused by a complex interaction of abnormalities in gonadotropins, androgens & estrogens. Insulin resistance and hyperinsulinemia contribute significantly to its pathophysiology. Although PCOS is associated with hyperandrogenism & infertility early in life, it is a harbinger of a lifelong condition that can lead to serious sequelae such as Endometrial or Ovarian cancer, Diabetes mellitus & Coronary artery disease. Thus, it is crucial to diagnose PCOS early in its course not only to recognize but also to delay or arrest its metabolic sequelae

Clinical use :
1. In Diagnosis of gonadal dysfunction and management of infertility
Increased level : Primary hypogonadism
Decreased level :
1. Hypothalamic GnRH deficiency
2. Hypopituitarism

*** End Of Report ***

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