LABORATORY REPORT

Redcliffe labs

Patient Name	:	Bill Date	:
DOB/Age/Gender	:	Sample Collected	:
Patient ID / UHID	:	Sample Received	:
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Sample Type	:	Barcode No	:
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Test Description	Value(s)	Unit(s)	Reference Range

BIOCHEMISTRY REPORT

Fertility Panel- Advance (Female)

Estradiol (E2)

ESTRADIOL(E2), SERUM Method : ECLIA	76.7	pg/mL

Interpretation:

Population	Bio. Ref. Ranges in pg/mL
Normal Menstruating Females:	
Follicular Phase	21 - 251
Mid-Cycle Phase	38 - 649
Luteal Phase	21 - 312
Postmenopausal Females not on HRT	<10 - 28
Postmenopausal Females on HRT	<10 - 144
Males	11 - 44

HRT = Hormone Replacement Therapy

Note

1.All applications that require measurement of very low level of estradiol (eg men, children, post menopausal women, hypogonadal women etc) recommended test is Estradiol, Ultrasensitive

2. LC- MS/MS is the gold standard for steroid hormone assays due to increased sensitivity & specificity as compared to immunoassays

Clinical Use

1. Determine estrogen status in women
2. Monitor follicular development during induction of ovulation
3. Assess estrogen production in males

Increased Levels

1. Precocious puberty (female)
2. Male gynecomastia
3. Liver disease
4. Ovarian tumors
5. Adrenal feminizing tumors

Decreased Level

1. Oral contraceptives
2. Ovarian failure

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BIOCHEMISTRY REPORT

Fertility Panel- Advance (Female)

TSH 3rd Generation

THYROID STIMULATING HORMONE (Ultrasensitive)	1.66	mIU/L	0.27 - 4.20

Method : ECLIA

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

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.

Primary malfunction of the thyroid gland may result in excessive (hyper) or below normal (hypo) release of T3 or T4. In addition as TSH directly affects thyroid function, malfunction of the pituitary or the hypo - thalamus influences the thyroid gland activity. Disease in any portion of the thyroid-pitutary-hypothala- mus system may influence the levels of T3 and T4 in the blood. In primary hypothyroidism, TSH levels are significantly elevated, while in secondary and tertiary hypothyroidism, TSH levels may be low. In addition, in the Euthyroid Sick Syndrome, multiple alterations in serum thyroid function test findings have been recognized in patients with a wide variety of non-thyroidal illnesses (NTI) without evidence of preexisting thyroid or hypothalami c-pitutary diseases.

Thyroid Binding Globulin (TBG) concentrations remain relatively constant in healthy individuals. However, pregnancy, excess estrogen, androgen, antibiotics, steroids and glucocorticoids are known to alter TBG levels and may cause false thyroid values for Total T3 and T4 tests.

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BIOCHEMISTRY REPORT			
Fertility Panel- Advance (Female)			
Luteinizing Hormone (LH)			
Luteinising Hormone-LH Method : ECLIA	9.67	mIU/mL	Women Follicular Phase : 2.4 - 12.6 Ovulation phase : 14.0 - 95.6 Luteal Phase : 1.0 - 11.4 Post Menopausal : 7.7 - 58.5 Men : 1.7 - 8.6

Interpretation:

Clinical Use

· Diagnosis of gonadal function disorders

· Diagnosis of pituitary disorders

Increased levels

· Primary hypogonadism

· Gonadotropin secreting pituitary tumors

Decreased levels

· Hypothalamic GnRH deficiency

· Pituitary LH deficiency

· Ectopic steroid hormone production

· GnRH analog treatment

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BIOCHEMISTRY REPORT			
Fertility Panel- Advance (Female)			
Follicle Simulating Hormone (FSH)			
Follicle Stimulating Hormone-FSH Method : ECLIA	7.18	mIU/mL	Men 1.5-12.4 Women Follicular Phase : 3.5 - 12.5 Ovulation phase : 4.7 - 21.5 Luteal Phase : 1.7 - 7.7 Post Menopausal : 25.8 - 134.8

Interpretation:

Clinical Use

· Diagnosis of gonadal function disorders

· Management and treatment of infertility in both genders

Increased levels

· Primary hypogonadism

· Gonadotropin secreting pituitary tumors

Decreased levels

· Hypothalamic GnRH deficiency

· Pituitary FSH deficiency

· Ectopic steroid hormone production

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BIOCHEMISTRY REPORT

Fertility Panel- Advance (Female)

Prolactin (PRL)

Prolactin Method : ECLIA	**0.425**	ng/mL	Men 4.04 - 15.2 Women(Not-pregnant)4.79 - 23.3

Result rechecked,Kindly correlate clinically.

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

BIOCHEMISTRY REPORT

Fertility Panel- Advance (Female)

Testosterone Total

Testosterone Total Method : ECLIA	22.7	ng/dL

Interpretation:

Age in Years	Reference Ranges ng/dL

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Test Description	Value(s)	Unit(s)	Reference Range
Males 20-49	249 - 836		
Males ≥ 50 years	193 - 740		
Females 20-49	8.4 - 48.1		
Females ≥ 50	2.9 - 40.8		

Reference values for Males (7-18 years) characterized by Tanner Stage

Tanner Stage	5-95th percentiles (ng/dL)
1	< 2.5
2	< 2.5 - 432
3	64.9 - 778
4	180 - 763
5	188 - 882

Reference values for females (8-18 years) characterized by Tanner Stage

Tanner Stage	5-95th percentiles (ng/dL)
1	<2.5 - 6.1
2	<2.5 - 10.4
3	<2.5 - 23.7
4	<2.5 - 26.8
5	4.6 - 38.3

Note

· All applications that require measurement of very low level of testosterone (eg hypogonadal men, children, virilization or intersex disorders in women etc) recommended test is Testosterone total, Ultrasensitive

· LC-MS/MS is the gold standard for steroid hormone assays due to increased sensitivity & specificity as compared to immunoassays

Clinical Use

· Assessment of testicular function in males

Increased levels

· Precocious puberty (Males)
· Androgen resistance
· Testotoxicosis
· Congenital Adrenal Hyperplasia

Decreased levels

· Delayed puberty (Males)
· Gonadotropin deficiency
· Testicular defects
· Systemic diseases

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BIOCHEMISTRY REPORT

Fertility Panel- Advance (Female)

Anti Mullerian Hormone (AMH)

ANTI MULLERIAN HORMONE; AMH,SERUM Method : ECLIA	3.6	ng/mL	

Interpretation:

Adult Reference Group	Age Range (years)	Reference Interval ng/mL
Females	18-25	0.96-13.34
Females	26-30	0.17-7.37
Females	31-35	0.07-7.35
Females	36-40	0.03-7.15
Females	41-45	0.00-3.27
Females	≥ 46	0.00-1.15
Males	> 18	0.73-16.05
Pediatric Reference Group		
Male Tanner Stage 1	8 - 13	4.95-144.48
Male Tanner Stage 2	8 - 17	5.02-140.06
Male Tanner Stage 3	10 - 19	2.61-75.90
Male Tanner Stage 4	12 - 18	0.43-20.14
Male Tanner Stage 5	11 - 19	1.95-21.20

Notes

1. AMH stars declining years prior to rise in FSH thus it is much more sensitive marker of ovarian reserve.
2. Discordant results between AMH and antral follicle count (AFC) may be observed as AMH reflects population of preantral follicles whereas AFC measures only those visualized-on USG

Comment

Antimullerian hormone (AMH), also known as mullerian-inhibiting substance is produced by Sertoli cells of the testis in males and by ovarian granulosa cells in females. In males, AMH serum concentrations are elevated under 2 years and then progressively decrease until puberty, when there is a sharp decline. In females, AMH is produced by the granulosa cells of small growing follicles from the 36th week of gestation onwards until menopause when levels become undetectable. Due to the gender differences in AMH concentrations, its changes in circulating concentrations with sexual development, and its specificity for Sertoli and granulosa cells, measurement of AMH has utility in the assessment of gender, gonadal function, fertility, and as a gonadal tumor marker. Since AMH is produced continuously in the granulosa cells of small follicles during the menstrual cycle, it is superior to the episodically released gonadotropins and ovarian steroids as a marker of ovarian reserve. Studies in fertility clinics have shown that females with higher concentrations of AMH have a better response to ovarian stimulation and tend to produce more retrievable oocytes than females with low or undetectable AMH. Females at risk of ovarian hyperstimulation syndrome after gonadotropin administration can have significantly elevated AMH concentrations. Polycystic ovarian syndrome can elevate serum AMH levels because it is associated with the presence of large numbers of small follicles. Serum AMH levels are increased in some patients with ovarian granulosa cell tumors, which comprise approximately 10% of ovarian tumors.

Clinical applications

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· To assess ovarian status, including follicle development, ovarian reserve, and ovarian responsiveness, as part of evaluation for infertility and assisted reproduction protocols.
· To assess menopausal status, including premature ovarian failure.
· To assess ovarian function in patients with Polycystic ovarian syndrome (PCOS).
· To evaluate infants with ambiguous genitalia and other intersex conditions.
· To evaluate testicular function in infants and children
· To diagnose and monitor patients with AMH secreting Ovarian granulosa cell tumors.

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