

**The National Ribat University**

**Faculty of Graduate Studies and Scientific Research**



# **Normal Prolactin level in non pregnant Sudanese women in Khartoum state**

**The research project it will be submitted in partial fulfillment of the  
requirements for the degree of M.Sc in Physiology**

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# *Dedication*

*From the depth of my heart I dedicate this work to:*

*My parents.....*

*For their continuous prayers, love, patience,*

*Encouragement and support*

*My brothers and sisters.....*

*Whom making life more fun*

*My friends.....*

*For always being there*

*Monera*

**Submitted By Monera AbdAlhmoud Siddig**

## **Acknowledgement**

**First I would like to thank god for shining his divine light upon me and giving me the strength to complete this work**

**Very special thanks to my supervisor *prof. Omer A. musa* for his valuable supervision and for his great support through this study**

**Thanks to the volunteers for their kind help**

# Normal Prolactin level in non pregnant Sudanese women in Khartoum State

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## Abstract

**Background:** Prolactin is synthesized by the lactotrophs, which represent approximately 15% of the tissue in the anterior lobe of the pituitary. Is secreted in pulstile fashion with 4 to 14 pulses per day, it is normal level about 40-530 IU/L The number of lactotrophs increases during pregnancy and lactation when the demand for prolactin is increased. The objective of this study is to assess the normal prolactin level among non pregnant Sudanese women in Khartoum state.

**Methods:** The study involved 20 non pregnant Sudanese women aged between 18 to 35 years old in Khartoum state to evaluate the normal prolactin level using the Immuno Enzymometric Assay.

**Results:** Mean prolactin was 188.61 iu/l while the range between 92.1 to 241 iu/l with a lower maximum than international level and lower range than the lab reference. There was significant correlation of prolactin with age, which decreased with age. 10 % of subjects (2 cases) had 169miu/l prolactin and another 10% 197miu/l.

**Conclusion:** there was a narrow range of prolactin level in this study with lower maximum value than the international prolactin level

**Keywords:** prolactin ,nonpregnant Sudanese women, immunoEnzymometric Assay

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# Introduction

Prolactin (PRL) is a peptide hormone secreted by the lactotrophs in the anterior pituitary gland. <sup>(1)</sup> When secreted in excess, it increases adrenal androgens and blunts the response of gonadotropes and gonadal cells to tropic factors by decreasing the gonadoliberin. As consequently chronically elevated prolactin induces amenorrhea and infertility in women and impotence in men <sup>(2-4)</sup> During pregnancy and lactation circulating levels of prolactin increased about ten folds and that is due to hormonal changes during pregnancy, primarily the change in estrogen levels. <sup>(5-6)</sup> measurement of prolactin concentration in the blood is essential in evaluating patients with infertility or suspected hypothalamic –pituitary dysfunction. The infertility clinic in Sudan uses the international standard level of prolactin as reference point.

Hyperprolactinemia is the most common pituitary hormonal abnormality. Prolactinomas- are the prolactin secreting tumours of the pituitary gland. It is secreting pituitary tumors, its most common cause of tumoral hyperprolactinemia <sup>(7)</sup> high levels of prolactin result in anovulation, secondary to inhibition of luteinizing hormone pulsatility. It has been suggested that raised prolactin levels can also compromise follicular development and reduce corpus luteal sensitivity to luteinising hormone with a resulting reduction in progesterone secretion. However, ovarian sensitivity to prolactin is very variable and moderately elevated levels may have no effect in some cases but cause anovulation and amenorrhoea in others. <sup>(8)</sup> Increased PRL level is considered as a risk factor for human breast and probably prostate cancer but more data is needed to prove this. <sup>(9)</sup>

Serotonergic receptor mediates prolactin release and that is why chronic use of serotonin reuptake inhibitors such as Fluoxetine leads to increase prolactin level. <sup>(10)</sup> The chronic use of Haloperidol (Dopamine antagonist) is associated with high prolactin. <sup>(11)</sup> Prolactin is secreted in pulsatile fashion with 4-14 pulses per day (60% occur during the sleep), the secretory pulses begin 60 to 90 minutes after onset of sleep so the blood test recommended to be taken two hours after wakenup <sup>(12,13)</sup>. Prolactin in the postpartum women was found in high concentration (140ng/ml) during first three days followed by a rapid fall to be around 30ng/ml by day eleven. <sup>(12)</sup> Breast pump, suckling and stimulation of the nipple and areola can increase the prolactin level. <sup>(14)</sup>

In a study on three ethnic groups of India; Rajputs, Gorkhas and South-Indians in May 2010 for evaluation of the plasma hormones including prolactin by using *Enzyme-Immunoassay (EIA)*, the results indicated that plasma hormone concentrations were within physiological range and inter-ethnic differences were most prominent between north- (Rajputs and Gorkhas) and south- Indians. <sup>(15)</sup>

In another study done in 1990 by Key, on Sex hormones in women in rural China and in Britain, prolactin concentrations did not differ significantly between the two countries in any age group. <sup>(16)</sup> In 2007 study done on serum level of prolactin in normally menstruating Nigerian women aged 17-40 years by Amballi A. A., Dada O. A., Adeleye A. O. and Jide Salu using ELA prolactin level was 157.0 – 302.2 iu/L. <sup>(17)</sup>

**Methodology:**

Across sectional descriptive study was conducted in Khartoum state on 20 non pregnant Sudanese women aged from 18 – 35 years old. Ethical approval taken from the National Ribat University and all the subjects gave a verbal consent for this study.

2.5 ml of venous blood was collected from each subject; collections were done between 10 a.m. and 11.00 am during menstruation.

The blood was collected into lithium heparin container. Each sample was centrifuged at 50.000 rounds per mints for 5 min. The serum obtained was put into a plan container and stored at  $-30C^0$ . Samples were analyzed by using PRL Immuo Enzymometric Assay by TOSOH AIA system Analyzer. The various assays results were analyzed by using the SPSS (Statistical Package for the Social Science) version 20

## RESULTS:

In this study the minimum level of prolactin was 92.10 IU/L and the maximum value was 241iu/l while the mean was 188.61. About 10% of subjects (2 subjects) their prolactin was 169 IU/L and another 10% was 197 IU/l. There was a correlation between menarche (first menstrual cycle) and prolactin level but not that significance as shown in table (1)

**Table (1)** mean prolactin IU/L in related to first period age

First period age/year	Mean of prolactin
9	175
11	*208
12	180
13	182
14	189
15	215

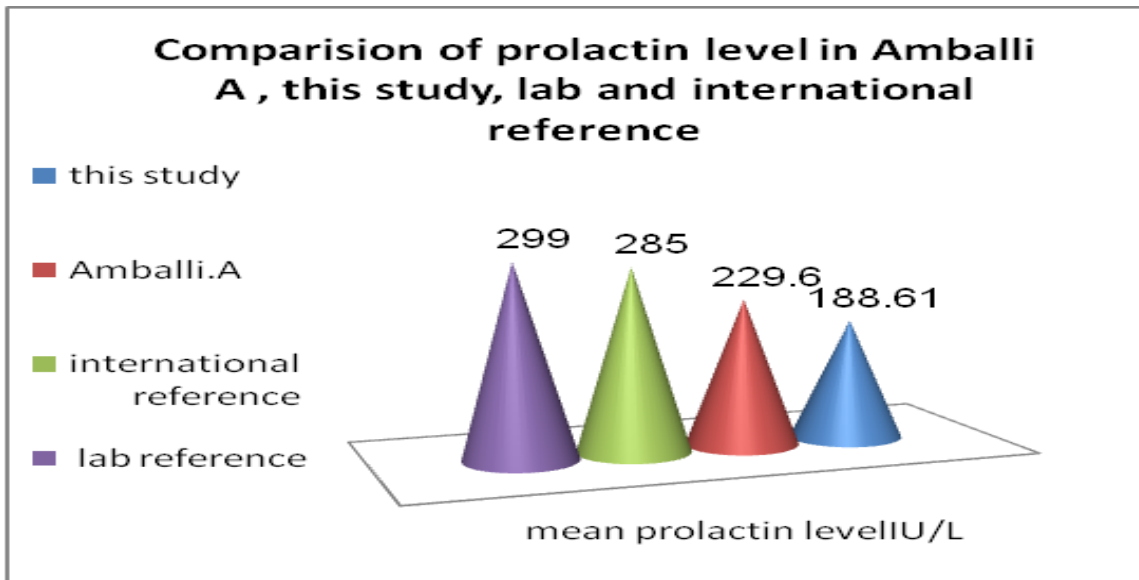
\*it is an odd result

While significant negative correlation between age and prolactin, prolactin diminished with age.



**DISCUSSION:**

In Amballi A. A study (2007) the prolactin range between 157 -302 .while in this study range from 92.10 up to 241miu/l which is significantly different with less maximum and minimum values. While the mean of prolactin in this study was 188.61 in the Amballia A study was 229.6 IU/L about 40 IU/L different. The international reference range from 40 to 530 IU/L as shown in table(2) and the figure below



**Table (2) Comparison of the prolactin level in Amballi A. study , lab reference and this study**

	In this study	Amallia	I.R	L.R
PRL iu/L	92.10 – 241	157-302	40-530	102-496
Mean	188.61	229.6		

**Conclusion:**

There was a narrow range of prolactin level in this study 92.10-241 IU/L with lower maximum value than the international prolactin level. Prolactin decreased with age

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