

# **Serum Growth Hormone and Prolactin Levels in Newborns with Hypoxic Ischemic Encephalopathy**

## ***Thesis***

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**By**

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ  
{فَأَمَّا الزَّبَدُ فَيَذْهَبُ جُفَاءً  
وَأَمَّا مَا يَنْفَعُ النَّاسَ  
فَيَمْكُثُ فِي الْأَرْضِ كَذَلِكَ  
يَضْرِبُ اللَّهُ الْأَمْثَالَ }  
صدق الله العظيم

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# LIST OF CONTENTS

	Page
<b>List of Contents</b>	<b>i</b>
<b>List of Abbreviations</b>	<b>ii</b>
<b>List of Tables</b>	<b>iv</b>
<b>List of Figures</b>	<b>vii</b>
<b>Introduction</b>	<b>۱</b>
<b>Aim of The Work</b>	<b>۳</b>
<b>Review of Literature</b>	
• <b>Hypoxic-Ischemic Encephalopathy (HIE)</b>	<b>۴</b>
• <b>Prolactin and growth hormone</b>	<b>۵۵</b>
<b>Patients and Methods</b>	<b>۸۳</b>
<b>Results</b>	<b>۹۸</b>
<b>Discussion</b>	<b>۱۲۴</b>
<b>Summary and Conclusion</b>	<b>۱۳۴</b>
<b>Recommendations</b>	<b>۱۳۸</b>
<b>References</b>	<b>۱۳۹</b>
<b>Arabic Summary</b>	

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## **ABBREVIATIONS**

<b>ACTH</b>	Adrenocorticotrophic hormone
<b>ADH</b>	Antidiuretic hormone
<b>BGL</b>	Blood glucose level
<b>CBF</b>	Cerebral blood flow
<b>Ck. BB</b>	Serum Creatine Kinase brain Fraction
<b>CP</b>	Cerebral palsy
<b>CPS</b>	Complex partial seizures
<b>EEG</b>	Electroencephalogram
<b>EGF</b>	Epidermal growth factor
<b>FSH</b>	Follicle-stimulating hormone
<b>GH</b>	Growth hormone
<b>GHR</b>	Growth hormone receptor
<b>GHRH</b>	Growth hormone releasing hormone
<b>GTC</b>	Generalized tonic-clonic seizures
<b>HIE</b>	Hypoxic-ischemic encephalopathy
<b>IGF-<math>\gamma</math></b>	Insulin like growth factor $\gamma$
<b>IGFs</b>	Insulin like growth factors

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<b>LH</b>	Luteinizing hormone
<b>MB</b>	Mammillary body
<b>MSH</b>	Melanocyte stimulating hormone
<b>NO</b>	Nitric oxide
<b>NSE</b>	Neuron specific enolase
<b>OC</b>	Optic chiasm
<b>PET</b>	Position emission tomography
<b>PL</b>	Posterior lobe
<b>PRFs</b>	Prolactin releasing factors
<b>PRL</b>	Prolactin
<b>PrRP</b>	Prolactin releasing peptide
<b>PVL</b>	Periventricular leukomalacia
<b>SPECT</b>	Single photon emission computed tomography
<b>TGF</b>	Transforming growth factor
<b>TRH</b>	Thyrotropin-releasing hormone
<b>TSH</b>	Thyroid-stimulating hormone
<b>VIP</b>	Vasoactive intestinal polypeptide

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## LIST OF TABLES

	Page
<b>Table (١)</b> : Criteria for defining an intrapartum hypoxic event	٨
<b>Table (٢)</b> : Apgar scoring system	٩
<b>Table (٣)</b> : Interpretation of Apgar score	١٠
<b>Table (٤)</b> : Factors affecting the Apgar score	١٢
<b>Table (٥)</b> : Frequencies of different organ injuries in asphyxia	٢٥
<b>Table (٦)</b> : Sarnat and Sarnat Stages of HIE	٣٢
<b>Table (٧)</b> : A guide to the supportive management of an infant at risk for hypoxic ischemic brain injury.	٤٧
<b>Table (٨)</b> : Major factors controlling GH secretion.	٦٦
<b>Table (٩)</b> : Comparison between the two studied groups regarding gestational age and anthropometric measures.	٩٨
<b>Table (١٠)</b> : Comparison between the two studied groups regarding sex.	٩٩
<b>Table (١١)</b> : Mode of delivery in both studied groups	٩٩
<b>Table (١٢)</b> : Comparison between the two studied groups regarding APGAR score .	١٠٠



---

**Table (١٣) :** incidence of seizures in both groups.  
١.١

**Table (١٤) :** Incidence of mechanical ventilation in  
١.٢  
the two studied groups.

**Table (١٥) :** Comparison between the two studied  
١.٣  
groups regarding PH and blood gases  
at cord and at ٢٤ hours

**Table (١٦) :** Comparison between the two studied  
١.٤  
groups regarding Blood picture.

**Table (١٧) :** Comparison between the two studied groups regarding PRL and GH. ١.٥

**Table (١٨) :** Comparison between the three subgroups of the patients regarding GA and anthropometric measurements. ١.٦

**Table (١٩) :** Comparison between the three Subgroups regarding Apgar score ١.٨

**Table (٢٠) :** Comparison between the three subgroups of the patients regarding PH and blood gases. ١.٩

**Table (٢١) :** Comparison between the three subgroups Of the patients regarding blood picture. ١١.٠

**Table (٢٢) :** Comparison between the three ١١.١

---

Subgroups the patients regarding  
GH and PRL.

**Table (٢٣) :** Correlations between prolactin and growth hormone and different studied parameters. ١١٤

**Table (٢٤) :** Comparision between PRL and GH in relation to mechanical ventilation. ١٢١

**Table (٢٥) :** Comparision between PRL and GH in relation to seizures. ١٢٢

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## LIST OF FIGURES

	<b>Page</b>
Figure(١): Effects of asphyxia	١٥
Figure(٢): Major relationship between perinatal asphyxia and cerebral blood flow	١٦
Figure(٣): Potential biochemical mechanisms of hypoxic ischemic cerebral injury	١٨
Figure(٤): Effect of accumulation of cytosolic calcium and free radicals formation	٢٠
Figure(٥): Periventricular leukomalacia	٣١
Figure(٦): Anatomy of the functional connections between the hypothalamus and pituitary gland	٥٨
Figure(٧): Diagrammatic representation of the structures of human GH and prolactin	٥٩
Figure(٨): Growth Hormone secretion	٦٢
Figure(٩): Summary of the actions of GH and prolactin and the feedback mechanisms controlling their secretions	٦٧
Figure(١٠): The effect of Growth Hormone	٧٣
Figure(١١): Diagrammatic representation of the daily pattern of GH and PRL secretion in adult humans	٧٨
Figure(١٢): Frequency of seizures among hypoxic newborns	١٠١
Figure(١٣): Frequency of mechanical ventilation among hypoxic newborns	١٠٢
Figure(١٤): Comparison between patients and controls as regard the mean values of the Prolactin.	١٠٥
Figure(١٥): Comparison between patients and controls as	١٠٦

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regard the mean values of the growth hormone.

Figure(١٦): Comparison between the three subgroups of patients and as regard the mean values of the Prolactin.	١١١
Figure(١٧): Comparison between the three subgroups of patients and as regard the mean values of the growth hormone.	١١٢
Figure(١٨): Correlation between PRL and $P_{CO_2}$ cord.	١١٥
Figure(١٩): Correlation between GH and $P_{CO_2}$ cord.	١١٦
Figure(٢٠): Correlation between PRL and $H_{CO_2}$ cord.	١١٧
Figure(٢١): Correlation between GH and $H_{CO_2}$ cord.	١١٨
Figure(٢٢): Correlation between PRL and PH cord.	١١٩
Figure(٢٣): Correlation between GH and PH cord.	١٢٠
Figure(٢٤): ROC curve for differentiation between hypoxic and normal newborns.	١٢٣

## **AIM OF THE WORK**

**The main objectives of this study are therefore to:**

- ١- Evaluate growth hormone and prolactin levels in newborns subjected to perinatal asphyxia.
- ٢- Investigate a possible relation between levels of growth hormone and prolactin and severity of hypoxic ischemic encephalopathy.

# **HYPOXIC-ISCHEMIC ENCEPHALOPATHY (HIE)**

## **Introduction and Definition:**

Hypoxic-ischemic encephalopathy (HIE) is defined as; the interruption of supply of vital nutrients to the brain, mainly oxygen and glucose, sufficiently substantial to cause irreversible damage. When the brain is depleted of oxygen, the result is hypoxic encephalopathy while impaired blood flow to the brain results in cerebral ischemia. Blood flow could be interrupted regionally, within a specific vascular distribution as with an embolic event causing a stroke, or globally as with a cardiopulmonary arrest leading to severe hypoxia and generalized ischemia. When there is impairment in the exchange of respiratory gases, oxygen, and carbon dioxide, the result is asphyxia (*Korthals and Colon, 2005*).

Although the predominant injury affects the brain, almost every organ system in the body is negatively impacted. Cerebral palsy (CP), seizure activity, and varying

degrees of developmental delays are some of the chronic disabilities seen in survivors ( *Verklan, 2009* ).

### **Incidence :**

Neonatal encephalopathy due to perinatal hypoxic-ischemic (HI) brain injury is a significant cause of infant mortality and morbidity. In spite of improvements to obstetric and neonatal care, the incidence of (HIE) remains approximately 2 to 4 per 1000 live-term births (*Glass and Ferriero, 2007*).

In Egypt, the neonatal mortality rate was reported to be 20 per 1000 live births (12 early and 8 late), and 18% was due to asphyxia (*Campbell et al., 2004*).

### **Causes of Hypoxic-Ischemic Encephalopathy:**

Hypoxic-ischemic encephalopathy is the result of a deprivation of oxygen and glucose to the neural tissue, which may be the result of either hypoxemia or ischemia. Hypoxemia is a decrease in the amount of oxygen circulating in the blood. Ischemia is a decrease in the flow of blood available to perfuse the brain. Of the two, ischemia is the most problematic because less oxygen and glucose are delivered to the brain ( *Verklan, 2009* ).

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