

**Complete Blood Count in the Neonatal
Intensive Care Unit**

*A thesis Submitted for Partial Fulfillment of Masters Degree in
Pediatrics*

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CONTENTS

	Page
List of figures.....	I
List of tables.....	IV
List of abbreviations.....	VII
Abstract.....	XIII
Introduction & Aim of the work.....	1
Review of literature.....	
<u>Chapter I: RED BLOOD CELL INDICES</u>	
Development.....	4
Red blood cell indices.....	8
• Hemoglobin and hematocrit.....	9
• Mean cell volume (MCV).....	12
• Mean Corpuscular Hemoglobin Content (MCHC).....	13
<u>CHAPTER II: WHITE BLOOD CELL INDICES.....</u>	
Development.....	14
White Blood cell indices:	
• Total and differential WBC count.....	18
• Immature to total count.....	19
Disorders of White Blood Cells.....	
• Neutrophils.....	22

- **Monocytes.....24**
- **Eosinophils.....24**
- **Basophils.....24**

Chapter III: PLATELETS.....

Development.....27

Thrombocytopenia..... 29

Causes of neonatal thrombocytopenia.....29

Subjects and Methods 34

Results..... 36

Discussion..... 80

Summary.....89

Conclusion..... 90

Recommendations.....91

References.....92

Arabic summary.....

List of figures

Figure	page
Figure 1. Sites and stages of fetal erythropoiesis.....	4
Figure 2. Erythropoietic progenitors and the growth factors influencing erythropoiesis.	7
Figure 3. Hematopoiesis.....	17
Figure 4. Peripheral blood smear from a term newborn.....	25
Figure 5. Distribution of male and female patients.....	36
Figure 6. Distribution of gestational age among patients.....	37
Figure 7. Mean and standard deviation of admission weight.....	38
Figure 8. Mean and standard deviation of duration of stay.....	38
Figure 9. Percentage of outcome among patients.....	39
Figure 10. Percentage of CRP among patients.....	39
Figure 11. Percentage of shift among patients.	40
Figure 12. Percentage of clinical diagnosis on admission for patients.	41
Figure 13. Relation between neonatal diagnosis and gestational age.....	43
Figure 14. Relation between neonatal sex and gestational age..	44
Figure 15. Relation between outcome and gestational age	45
Figure 16. Relation between CRP and gestational age.	46

Figure	page
Figure 17. Relation between shift and gestational age.	47
Figure 18. Percentage of CRP in relation to neonatal diagnosis in patients with gestational age <37 weeks.....	50
Figure 19. Percentage of CRP in relation to neonatal diagnosis in patients with gestational age >37 weeks.....	50
Figure 20. Percentage of shift in relation to neonatal diagnosis in patients with gestational age <37 weeks.....	53
Figure 21. Percentage of shift in relation to neonatal diagnosis in patients with gestational age >37 weeks.	53
Figure 22. Mean and standard deviation for CBC among neonates with gestational age <37 weeks.....	55
Figure 23. Mean and standard deviation for CBC among neonates with gestational age >37 weeks.....	56
Figure 24: Mean and standard deviation for CBC among neonates with gestational age >37 weeks.....	57
Figure 25: Mean and standard deviation for CBC among neonates with gestational age <37 weeks.....	59
Figure 26: Mean and standard deviation for CBC among neonates with gestational age >37 weeks.....	61

List of Tables

Table	Page
Table 1	10
Mean Red Blood Cell (RBC) values during gestation.	
Table 2	11
Normal hematologic values during the first two weeks of life in the term infant	
Table 3	11
Post natal changes in the hemoglobin and Red Blood Cell (RBC) indices in term infants.	
Table 4	12
Serial hemoglobin values in low birth weight infants.	
Table 5	26
Neonatal neutrophil indices reference ranges.	
Table 6	32
Classification of fetal and neonatal thrombocytopenia.	
Table 7	33
Comparison of the natural history of early and late thrombocytopenia in neonates.	
Table 8	36
Percentage of female and male patients.	
Table 9	37
Percentage of gestational ages among patients.	

Mean and standard deviation for CBC among neonates with gestational age <37 weeks

Table 10.....37

Mean and standard deviation of admission weight and duration of stay.

Table 11 38

Percentage of outcome of patients.

Table 12.38

Percentage of CRP among patients.

Table 13.....40

Percentage of shift among patients.

Table 14.41

Percentage of clinical diagnosis on admission

Table 15.42

Relation between neonatal diagnosis and gestational age.

Table 16.43

Relation between neonatal sex and gestational age

Table 17.44

Relation between outcome and gestational age

Table 18.....45

Relation between CRP and gestational age

Table 1946

Relation between shift and gestational age

Table 20.....49

Relation between CRP and neonatal diagnosis according to gestational age

Table 21.....52

Relation between shift and neonatal diagnosis according to gestational age.

Table 22.....55

Mean and standard deviation for CBC among neonates with gestational age <37 weeks

Table 23.....57

Mean and standard deviation for CBC among neonates with gestational age >37 weeks

Table 24.....59

Mean and standard deviation for CBC among neonates with gestational age <37 weeks.

Table 25.....61

Mean and standard deviation for CBC among neonates with gestational age >37 weeks.

Table 26.....65

Correlation analysis between WBC, RBC, Hb, Hct, and different variables for patients with gestational age <37 weeks.

Table 27.....69

Correlation analysis between WBC, RBC, Hb, Hct, and different variables for patients with gestational age >37 weeks.

Table 28.....71

Correlation analysis between PLT, MCV, MCH, MCHC, and different variables for patients with gestational age <37 weeks.

Table 29.....73

Correlation analysis between PLT, MCV, MCH, MCHC, and different variables for patients with gestational age >37 weeks.

Table 30.....75

Correlation analysis between lymphocytes, monocytes, eosinophils, basophils, and different variables for patients with gestational age <37 weeks.

Table 31.....77

Correlation analysis between lymphocytes, monocytes, eosinophils, basophils, and different variables for patients with gestational age >37 weeks.

Table 32.....78

Correlation analysis between staff, segmented, TSB, DSB, and different variables for patients with gestational age <37 weeks.

Table 33.....80

Correlation analysis between staff, segmented, TSB, DSB, and different variables for patients with gestational age >37 weeks.

List of Abbreviations

CBC	Complete Blood Count
RBC	Red Blood Cells
WBC	White Blood Cells
Hb	Hemoglobin
Hct	Hematocrit
CRP	C Reactive Protein
PLT	Platelets
LYMPH	Lymphocytes
MONO	Monocytes
EOSINO	Eosinophils
BASO	Basophils
SEGS	Segmented leucocytes
MCV	Mean Corpuscular Volume
MCH	Mean Corpuscular Hemoglobin
MCHC	Mean Corpuscular Hemoglobin content
TSB	Total Serum Bilirubin
DSB	Direct Serum Bilirubin

Abstract

In this work, the complete blood count of neonates admitted to the Cairo University Pediatric Hospital NICU was studied in the period from January 2006 to December 2006, and correlations between findings were performed.

The number of studied patients was 800 with preterm patients constituting 34.1% and full term patients 65.9%. 82.9% of the patients were discharged and 17.1% died.

The most common diagnosis in the preterm group was respiratory distress (35.2%) and the most common diagnosis in the full term group was neonatal jaundice (47.1%). The least common diagnosis in both groups was hypoxic ischemic encephalopathy.

On correlating the complete blood count findings with the clinical diagnoses of the patients, it was found in cases of neonatal sepsis, the WBC were lower than previous studies but hemoglobin and platelets were in the same range.

In cases of low birth weight, preterms had higher WBC, platelets, and hematocrit than full terms but they had lower hemoglobin.

On studying correlations between complete blood count findings, preterms had positive correlations between WBC and RBC, WBC and hemoglobin, hematocrit and platelets, and they had non significant correlations between WBC and hematocrit, WBC and platelets, hemoglobin and platelets.

Also, preterms and full terms had negative correlation between hemoglobin and post natal age, but no correlation with gestational age.

Key word: Complete Blood, Neonatal Intensive Care, Pediatrics

INTRODUCTION

The first few weeks to months after birth are marked by dramatic physiologic and anatomic changes in every organ system as the neonate adapts to extrauterine life independent of the placenta.

Clinical presentation of illness and laboratory data must be interpreted against a backdrop of major developmental alterations. (**Cavaliere 2004**). Performing a CBC has acquired an almost ritual quality. Virtually all published guidelines suggest obtaining this test. (**Escobar, 1999**).

The quality of laboratory test results is affected by preanalytic variables such as specimen collection, specimen handling, sample size, limited blood availability, the variation of test results depending on blood sampling sites, and the effect of vigorous crying or exertion.

Although these factors are important for samples from patients of any age, they are particularly important in the neonatal period and infancy (**Coffin et al 2002**)

Introduction

There is a statistically significant difference between capillary and venous or arterial CBCs in the neonatal period. The blood from a skin puncture has higher values for hemoglobin, hematocrit, RBCs, WBCs, and neutrophils (**Kayiran 2003**) The perfusion, metabolic state, and other factors may further affect the composition of the capillary blood, and disturbed circulation, particularly microcirculation, results in significantly higher values of capillary than venous hematocrit

(Linderkamp 1977)

The time of umbilical cord clamping also affects the hemoglobin levels in neonates. A meta-analysis of 15 controlled trials demonstrated that delayed clamping for 2 minutes or more after birth is beneficial to the newborn, although it may cause asymptomatic polycythemia **(Hutton 2007)**. This beneficial effect extends into early infancy, and less severe physiologic anemia developed in children whose umbilical cord clamping was delayed **(Ceriani 2007)**.