

Sudan University of Science and Technology
College of Graduate Studies



**Early Neonate Sepsis: Hematological Changes and
Risk Factors**

**تسمم الدم المبكر لدى الأطفال حديثي الولادة: التغير في مقاييس الدم
وعوامل الخطورة**

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Laboratory Science**

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الاية

"وقل ربي ارحمهما كما ربياني صغيرا"

صدق الله العظيم

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Dedication

I dedicate my work

To the precious soul of my mother.

To my father ,sister and brother.

To my lovely younger sister Dr. "**Esraa Ahmed** "who helped and supported me and gave me believe on myself.

To all my teachers and colleagues.

Acknowledgment

Thanks first and last to **Allah** who enabled me to accomplish this study by grace of him.

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Finally I wish to express my thanks to all the people who helped in this work.

Abstract

Neonatal sepsis is one of the important causes of neonatal morbidity and mortality particularly in the developing countries and its diagnosis remains challenging. This is a case control analytical study conducted in Omdurman Teaching Hospital , Khartoum State during the period (April- July) 2015. One hundred neonates confirmed as neonatal sepsis (case) and thirty healthy neonates (control) of both sexes were enrolled in the study.

Venous blood was collected antiseptically from the neonates and analyzed by a hematological analyzer (Sysmex KX2IN) .The obtained data was analyzed by SPSS version 20 .A significant positive correlation was found between maternal urinary tract infection ($P \leq 0.01$) , miscarriage ($P \leq 0.00$) and neonate sepsis .No correlation was found between neonate sepsis and prolonged membrane rupture ($P \leq 0.16$) or route of delivery. C-section delivery ($P \leq 0.62$) and spontaneous vaginal delivery ($P \leq 0.77$) Septic neonates registered significantly higher values ($P \leq 0.05$) than the control group with regard to WBCs (17.4 vs 9.3) $\times 10^9 /L$, neutrophil (60.3% vs 47.9%) and low platelets count (161.7 vs 202) $\times 10^9 /L$. No significant changes (P value ≤ 0.05) were observed between the septic neonates and the control group with regard to Hb ,RBCs Hct and red cell indices. It is concluded that early onset sepsis is manifested with significant changes in some hematological parameters.

مستخلص البحث

يعتبر تسهم الدم عند الاطفال حديثي الولادة من اهم مسببات الاصابة والوفيات خصيصا في الدول النامية ولايزال التشخيص من اصعب التحديات .

هذه دراسة تحليلية اجريت في مستشفى امدرمانالتعليمي في ولاية الخرطوم من الفترة (ابريل-يوليو) 2015 .تم اشراك مئة طفل من حديثي الولادة مصابين بتسمم الدم وثلاثين طفل من الاصحاء كمجموعة ضابطة.

جمعت عينات الدم الوريدية تحت ظروف معقمة من الاطفال حديثي الولادة وحللت بواسطة جهاز تحليل الدم الاتوماتيكي .وحللت البيانات المتحصل عليها ببرنامج حزمة التحليل الاحصائي للعلوم الاجتماعية .

بينت النتائج علاقة ايجابية بين الأصابة بتسمم الدم المبدئي لدى حديثي الولادة و اصابة الامهات بالتهاب المسالك البولية خلال فترة الحمل(0.01) او اجهاض الامهات المتكرر (0.00) كما لم تظهر النتائج علاقة بين انفجار الغشائي المزمن لدى الأمهات (0.16) او طريقة الولادة. الولادة القيصرية(0.62) والولادة الطبيعية التلقائية (0.77) وبين الاصابة بتسمم الدم المبدئي .

سجل الاطفال حديثي الولادة المصابين بتسمم الدم المبدئي قيم اعلى في كرويات الدم البيضاء ذات دلالة معنوية (17.4 و 9.3) مقارنة بالمجموعة الضابطة ، وارتفاع ذو دلالة معنوية في العدلات (60.3 و 47.9%) وانخفاض ذو دلالة معنوية في الصفائح الدموية

(161 و 202) $\times 10^9/L$.

كما لم تظهر النتائج اختلافات في كرويات الدم الحمراء او مستوى الخضاب في الدم اوفي معدل التكدس في كلا المجموعتين.

تم استنتاج ان تسمم الدم المبدئي مرتبط بتغيرات ملحوظة في بعض المقاييس الدموية

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Abbreviations

APC: American Academy of Paediatrics.

BC :Band Count

CBC: Complete Blood Count

CD: Cluster of Differentiation

CDC: Central Disease Control and Prevention.

CNS: Central Nervous System.

CONS: Coagulase negative staphylococci.

CRP: C _Reactive protein.

DLC: Differential Lymphocyte Count.

DNC:Differential Neutrophil Count.

EOD: Early Onset Disease.

EOS: Early Onset Sepsis

ESR: Erythrocyte Sedimentation Rate.

GBS: Group B Streptococcus.

HB: Hemoglobin.

Hct: Hematocrit.

ICCS: Intracellular Cytokines Staining.

IMC: Integrated Management of Childhood.

LBW: Low Birth Weight.

LOD: Late Onset Disease.

MCH:Mean Cell Hemoglobin

MCHC: Mean Cell Hemoglobin Concentration.

MCV: Mean Cell Volume.

NEC: Necrotizing Enterocolities.

NICU: Neonate Intensive Care Unit.

N.S: Neonatal Sepsis .

PC: Platelets Count.

RBCs: Red Blood Cells

PROM: Prolong Rupture of Membrane.

TPO: Thrombopoietin.

UTI: Urinary Tract Infection.

VLBW: Very LowBirth Weight.

WBCs: WhiteBlood Cells.

WHO: World Health Organization.