شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

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جامعة عين شمس

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Evaluation of the Diagnostic and Prognostic Potential of Circulating miR-34a in Neonatal Sepsis

Thesis

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Master Degree in ***Pediatrics***

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List of Contents

Title	Page No.
List of Tables	i
List of Figures	iii
List of Abbreviations	v
Introduction	1
Aim of the Work	3
Review of Literature	
Neonatal Sepsis	4
microRNAs	36
miR-34	49
Patients and Methods	59
Results	76
Discussion	90
Summary	96
Conclusion	99
Recommendations	100
References	101
Arabic Summary	

List of Tables

Table No.	Title	Page No.
Table 1:	Initial signs and symptoms of infection in newborn infants	14
Table 2:	EMA sepsis scoring system	15
Table 3:	Töllner sepsis scoring system	15
Table 4:	EONS prediction calculator variables	17
Table 5:	Hematological scoring system	19
Table 6:	Interpretation of hematological scoring system.	19
Table 7:	Empiric antibiotic recommendations from the Canadian Pediatric Society and the American Academy of Pediatrics	33
Table 8:	Neonatal scoring system	62
Table 9:	Hematological scoring system	63
Table 10:	Interpretation of hematological scoring system.	63
Table 11:	Components of PCR reaction.	72
Table 12:	PCR cycles.	73
Table 13:	Demographic Characteristics of the studied neonates	76
Table 14:	Maternal and neonatal Demographic Characteristics of the Neonatal Sepsis group	77
Table 15:	Clinical Characteristics of the Neonatal Sepsis group	78
Table 16:	Descriptive statistics for Laboratory data of the Neonatal sepsis group	79
Table 17:	Comparative analysis for the serum expression level of miR-34 between neonates with sepsis and healthy control groups	80

List of Tables cont...

Table No.	Title	Page No.
Table 18:	Comparative analysis between different risk groups of neonates with sepsis for the expression of miR-34a.	81
Table 19:	Diagnostic potential of miR-34a in Neonates with sepsis compared to healthy controls (ROC Curve)	83
Table 20:	Descriptive statistics for scoring system of Neonates with sepsis	84
Table 21:	Comparative analysis for miR-34a expression level with clinical sepsis and hematology score in neonatal sepsis.	85
Table 22:	Prognostic potential of miR-34a in Neonates with sepsis according to the clinical and hematological scores compared (ROC Curve)	87
Table 23:	Spearman's correlation between miR-34a expression and clinical scores for sepsis.	89

List of Figures

Fig. No.	Title	Page No.
Figure 1:	Biogenesis of miRNAs	38
Figure 2:	Circulating miRNAs detected in different pediatric diseases	41
Figure 3:	miR-34	49
Figure 4:	Function of miR-34	51
Figure 5:	Alternatinve mechanisms of miR-34 regulation in cancer	53
Figure 6:	MicroRNA-34a role in cardiovascular system	56
Figure 7:	Boxplot graph illustrating a high significant difference in the expression of miR-34 between neonates with sepsis and healthy controls	80
Figure 8:	Boxplot graph illustrating a significant difference in miR-34a between neonates with sepsis who born to mothers with risk factor compared to those without risk factor.	82
Figure 9:	Boxplot graph illustrating a significant difference in miR-34a between neonates with sepsis with neonatal risk factors compared to those withoutrisk factor.	82
Figure 10:	ROC curve analysis showed a significant diagnostic potential of miR-34a in discriminating neonates with sepsis from healthy neonates	83
Figure 11:	Boxplot graph illustrating a significant difference in the expression level of miR-34a between neonates with neonatal clinical score <10 and >10 (p=0.01)	86

List of Figures cont...

Fig. No.	Title	Page No.

Figure 12: Boxplot graph illustrating a significant difference in the expression level of miR-34a between neonates with neonatal hematology score (3 – 4) and >4 (p=0.04). 86

Figure 13: ROC curve analysis showed a significant prognostic potential of miR-34a in discriminating neonates with sepsis that had a clinical sepsis score <10 from those with CSS >10. 88

Figure 14: ROC curve analysis showed a significant prognostic potential of miR-34a in discriminating neonates with sepsis that had a clinical hematology score <4 from those with score >4. 88

List of Abbreviations

Abb.	Full term
AAP	American Academy of Pediatrics
ANC	Absolute neutrophil count
ASCAs	Anti-Saccharomyces cerevisiae antibodies
ASD	Autism spectrum disorder
AUC	Area under the curve
BPD	Bronchopulmonary dysplasia
CBC	Complete blood count
CDC	Center for Disease Control and Prevention
CFLD	Cystic fibrosis-associated liver disease
CoNS	Coagulase- negative Staphylococcus
CPS	Canadian Pediatric Society
CRP	C- Reactive protein
CSF	Cerebrospinal fluid
CVD	Cardiovascular diseases
ELBW	Extremely low birth weight
EONS	Early-onset neonatal sepsis
ES	Ewing's sarcoma
GBS	Group B streptococcal
HALI	Hyperoxia-induced lung injury
hs-CRP	High Sensitivity-CRP
HSS	Hematological Sepsis scoring system
HSS	Hematological sepsis scoring system
IAP	Intrapartum antibiotic prophylaxis
IgG	Immunoglobulin G
IL-6	Interleukin-6
IPA	Intra-partum antibiotic
IQR	Interquartile range
LBP	Lipopolysaccharide Binding Protein
LBW	Low birth weight
LET-7	larger elegant non coding transcriptor RNA
LIN-14	Like insulin growth factor gene 14
LONS	Late-onset neonatal sepsis
LP	Lumbar puncture

List of Abbreviations cont...

Abb.	Full term
MALDI-TOF	Matrix-Assisted Laser Desorption Ionization Time of Flight Mass Spectrometry
miRNAs	MicroRNAs
MMWR	Morbidity and Mortality Weekly Report
NICUs	Neonatal intensive care units
NNT	Number needed to treat
NO	Oxide nitric
NRCMs	Neonatal rat cardiomyocytes
NS	Non-significant
NSS	Neonatal sepsis scoring system
OS	Osteosarcoma
PAF	Platelet activating factor
PAH	Pulmonary arterial hypertension
PCT	Procalcitonin
qRT-PCR	Quantitative real-time polymerase chain reaction
RB	Retinoblastoma
RISC	RNA-induced silencing complex
RMS	Rhabdomyosarcoma
SAA	Serum Amyloid A
SD	Standard deviation
SIRS	Systemic inflammatory response syndrome
SPSS	Statistical package for Social Science
T1D	Type 1 diabetes
TNF- α	Tumor Necrosis Factor Alpha
TSB	Total serum bilirubin
US	United States
UTR	Untranslated region
VLBW	Very low birth weight
VRE	Vancomycin-resistant enterococcus

INTRODUCTION

Neonatal sepsis is a complex syndrome which characterized by systemic inflammatory response. The high mortality rate of neonatal sepsis is contributed to late diagnosis and improper management ***(Dhas et al., 2018).***

Although, bacterial culture remains the gold standard diagnostic test in sepsis; at least 48 hours was required to provide a result in addition to high false negative results. In contrast, the biological biomarkers such as ILs (interleukins), procalcitonin and C-reactive protein (CRP) had high sensitivity but poor specificity ***(Dhas et al., 2018).***

Researchers starts to link genetic variations with sepsis pathogenesis, to search for their clinical utility as diagnostic, prognostic and therapeutic markers ***(Guennewig et al., 2014).***

MicroRNAs (miRNAs) are non-coding short RNAs that are involved in all vital biological cell processes including: cell growth, development, differentiation and apoptosis. They exerts their function via post-transcriptional gene regulation ***(Guennewig et al., 2014).***

Several miRNAs have been implicated in the regulation of different stages of host immune response. Recent studies demonstrated that miR-155 regulates the proliferation of T-helper lymphocyte, miR-146a is significantly implicated in the

downregulation of Interleukin-1 and miR-181b regulates vascular endothelial inflammation ***(Yu et al., 2016).***

The analysis of miRNAs expression in whole blood from patients with sepsis showed a significant overexpression of miR-34a, and it had higher expression in neonatal monocytes than in adults ones ***(Jiang et al., 2012).***

In vivo experimental studies demonstrates that miR-34a directly controls T cell function through activating nuclear factor kappa-light-chain–enhancer of activated B cells (NF-κB), and acts as negative regulator for Tumor Necrosis Factor-α (TNF-α) and Interleukin-6 (IL-6) ***(Xu et al., 2018).***

Although the functions of miR-34a has been not yet been validated in neonatal immune cells, these miR-34a could participate in shaping the neonatal immune response or development, deserving further investigations ***(Xu et al., 2018).***