Immunomodulatory effect of packed red blood cells transfusion in premature neonates at different postnatal ages

Thesis
Submitted for partial fulfillment of M.Sc. Degree in Pediatrics

By
Mustafa Mahmoud Abd Elkader Nada
M.B., B.ch.
Cairo University

Supervisors:

Prof. Dr. Lamiaa Mohamed Abdel Fattah Mohsen
Professor of Pediatrics and Neonatology
Faculty of Medicine
Cairo University

Prof. Dr. Hala Yousef Ibrahem
Professor of Pediatrics
National Research center

Prof. Dr. Hala Aly Abdel Rahman
Professor of Clinical and Chemical Pathology
Faculty of Medicine
Cairo University

Faculty of Medicine
Cairo University
2016

التأثيرات المناعية المترتبة على نقل كرات الدم المكدسة في الأطفال المبتسرين ناقصي النمو في مختلف الأعمار بعد الولادة

رسالة مقدمة من

الطبيب/ مصطفى محمود عبد القادر ندا

توطئة للحصول على درجة الماجستير في طب الأطفال

تحت إشراف

ا.د/ لمياء محمد عبدالفتاح محسن

أستاذ طب الأطفال

كلية الطب – جامعة القاهرة

ا.د/ هالة يوسف إبراهيم

أستاذ طب الأطفال

المركز القومي للبحوث

ا.د/ هالة علي عبد الرحمن

أستاذ الباثولوجيا الإكلينيكية

كلية الطب – جامعة القاهرة

كلية الطب

جامعة القاهرة

2016

DEDICATION

This work is dedicated to

-The soul of my father, you were the source of love and care for me; I wish you were with me.

-My mother for her unlimited support that always pushes me forwards.

-My beloved wife who gave me spirit and courage to proceed in this work.

-My sisters for their support.

-My daughter who lightened my life.

ACKNOWLEDGEMENT

-First of all, grateful appreciation to "Allah ", who helped me greatly to perform this work.

-I wish to express my sincere gratitude and thanks to ***Prof. Dr. Lamiaa Mohamed Abdel Fattah Mohsen*** Professor of Pediatrics and Neonatology, Cairo University. For her generous help and support.

I am deeply indepted to ***Prof. Dr. Hala Aly Abdel Rahman*** Professor of Clinical and Chemical Pathology, Faculty of medicine, Cairo University, my deep gratitude goes to her faithful supervision, extreme patience, great cooperation and her meticulous revision of this work.

-My deep gratitude goes for ***Prof. Dr. Hala Yousef Ibrahem*** Professor of pediatrics, National Research Center. For her

constant support, encouragement and constructive advices that have been of utmost help.

-I would like to express my sincere thanks and great appreciation to ***Dr. Rabab Elsayed El Hawary*** lecturer of immunology, Faculty of Medicine, Cairo University. For her valuable help, support and kind supervision.

-

-I would like to thank ***Dr. Abeer selim Moustafa*** researcher, pediatric departement. National Research Center. For her valuable help and support.

Abstract

Objectives:

The aim of the study is to detect the increase in proinflammatory cytokine (interleukin- 8) and marker of endothelial activation (soluble intercellular adhesion molecule- 1), as manifestation of transfusion-related immunomodulation in preterm neonates at different postnatal ages.

Method:

Fifty neonates with gestational age (GA) 28-32 were involved in this study and were divided into two groups, each group was twenty five. The first group received blood within 1-2 weeks after birth and the second group received blood within 3-4 weeks after birth. The blood sample was obtained before and four to six hours after transfusion and another sample was obtained from the blood bag. Each plasma sample was analyzed for interleukin- 8 (IL-8) and soluble intercellular adhesion molecule- 1 (sICAM-1).

Results:

In group 1 neonates the post-transfusion levels of IL-8 was higher than the pre-transfusion levels with no statistical significance yet there was a trend. In group 2 neonates the post-transfusion IL-8 levels was higher than the pre-transfusion levels and the difference was not statistically significant. In group 1 & 2

neonates, there was no statistical significance between the pre- and post-transfusion sICAM-1 levels. There was a positive correlation between the post-transfusion level of IL8 and its level in packed red blood cells (PRBCs) bags in both groups. This correlation was significant in group 2 and was not significant, but yet there was a trend in group 1. And there was a significant positive correlation between post-transfusion levels of IL-8 and sICAM-1 in group 1 neonates.

Conclusion:

It is not evident in our study that there is an immunomodulatory effect of PRBCs transfusion. The positive correlation between post-transfusion IL-8 level and its level in PRBCs denotes passive transmission from blood bag.

Key words:

TRIM, IL-8, sICAM-1, blood transfusion, cytokines, preterm.

Contents

List of Tables

List of Figures