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Alloimmunization among Transfusion-Dependent Thalassemia Patients in the West Bank

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Thesis Approval

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Dedication

This thesis is dedicated to the following people:

My great parents, Aysha and Abdelrahman, who never stopped giving of themselves in countless ways.

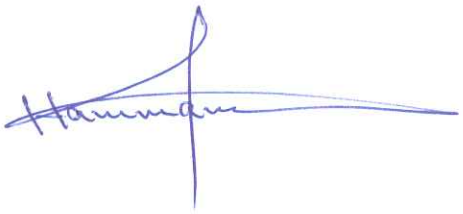
My dearest wife, Sanaa, who led me through the valley of darkness with the light of hope and support.

My beloved brothers and sister; particularly my great brother Husni, who stood by me when things looked bleak.

All of the thalassemia patients in Palestine, who needed this re

Declaration:

I Certify That This Thesis Submitted for The Degree of Master, is The Result of My Own Research, Except Where Otherwise acknowledged, and That This Study (or Any Part of The Same) Has Not Been Submitted for A Higher Degree to Any Other University or Institute.

Signed: 

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Abstract

Introduction:

Red blood cell transfusion has greatly reduced the mortality and morbidity in multiply transfused thalassemia patients. However, this can result in red blood cell isoimmunization with alloantibodies which can lead to serious complications such as acute and delayed hemolytic transfusion reactions.

Objectives:

To assess the frequency and types of alloantibodies in transfusion-dependent thalassemia patients in the middle and southern regions of the West Bank. Furthermore, to assess the association between alloantibody development and gender, age of first transfusion, blood type, splenectomy, frequency of transfusion.

Methods:

This cross-sectional study was performed between February and June, 2017 at three Thalassemia Centers in the southern and middle districts of the West Bank. A total of 101 transfusion-dependent thalassemia patients from these centers were included. Clinical and transfusion records were examined for age of patients, age at first transfusion therapy, total number of blood units transfused, and the status of spleen. Alloantibody screening and identification was also performed by using the gel card method (Diamed ID, Switzerland).

Results:

Eleven out of one hundred and one participants (10.9%) had alloantibodies. Ten of them (90.9%) were diagnosed with β-thalassemia major, and one (9.1%) was diagnosed with β-thalassemia intermedia. The majority of alloimmunized patients were females (8; 72.7%).

Eight patients (72.7%) were splenectomized. Seven patients (63.6%) had single alloantibody, while four (36.4%) developed multiple alloantibodies.

Six types of alloantibodies were identified, three (50%) were against antigens from the Rh system (anti-E, anti-C and anti-D), two (33.3%) were against antigens from the Kell system (anti-K and anti-Kp^a) and one (16.7%) was against an antigen from the Kidd-system (anti-Jk^a).

Conclusions:

This data showed quite high alloimmunization rate among transfusion-dependent thalassemia patients in the middle and southern regions of the West Bank. The most frequently detected alloantibodies were against the Rh and Kell antigens.

In order to reduce the alloimmunization in these patients, a policy to perform extended red cell phenotyping of the patients and issuing antigen-matched blood should be adopted.

Table of Content

CHAPTER FIVE

CHAPTER SIX

List of Tables

List of Figures

List of Appendices

List of Abbreviations

AHG: Anti-Human Globulin

ATP: Adenosine Tri-Phosphate

ATR: Acute Transfusion Reaction.

CPD: Citrate Phosphate Dextrose

CPDA: Citrate Phosphate Dextrose Adenine.

DAT: Direct Anti-globulin Test

DHTR: Delayed Hemolytic Transfusion Reaction

DTR: Delayed Transfusion Reaction.

EDTA: Ethylene Diamine Tetraacidic Acid

ESR: Erythrocyte Sedimentation Rate .

FDA: Food and Drugs Administration

GVHR: Graft Versus Host Reaction

HLA: Human leukocyte antigen

IAT: Indirect Anti-globulin Test

IgG: Immunoglobulin G

ISBT: International Society of Blood Transfusion

LISS: Low Ionic Strength Saline.

الكشف عن الاجسام المضادة لمولدات الضد الغريبة عند مرضى فقر دم حوض البحر الابيض المتوسط في الضفة الغربية

اعداد: همام عبد الرحمن حسني علي

اشراف: د. أدهم أبو طه

مشرف ثاني: د. خالد يونس

الملخص

مقدمة:

إن نقل الدم من شأنه أن يقلل بشكل ملحوظ من مضاعفات ومخاطر مرض فقر دم حوض البحر الأبيض المتوسط (الثلاسيميا). لكن مرضى الثلاسيميا بحاجة إلى نقل دم بشكل دوري ومستمر وهذا قد يؤدي إلى تكون أجسام مضادة (Alloantibody) ضد مولدات الضد الغريبة (Foreign Antigens) التي تحملها خلايا الدم الحمراء في الدم المنقول للمرضى.

هذه الأجسام المضادة المتكونة قد تؤدي إلى مضاعفات خطيرة تقلل من درجة استفادة المريض من الدم المنقول وقد تصل المضاعفات إلى درجة قد تشكل خطورة على حياة المريض.

الأهداف:

تهدف هذه الدراسة الى تحديد نسبة تكون الاجسام المضادة (Alloantibody) لدى مرضى الثلاسيميا في جنوب و وسط الضفة الغربية في فلسطين وتحديد انواعها الاكثر انتشارا و تحديد العلاقة بين تكون مثل هذه الاجسام المضادة و عوامل مختلفة كالجنس و العمر عند اول عملية نقل دم و نوع الدم و حالة استئصال الطحال.

طريقة العمل:

تم عمل هذه الدراسة في الفترة الممتدة من شهر شباط من عام 2017 وحتى حزيران من العام نفسه في ثلاث مراكز لمرضى الثلاسيميا في جنوب ووسط الضفة الغربية.

تم جمع 101 عينة حيث تم دراسة المعلومات السريرية والاكلينيكية للمرضى كالعمر ومعدل فترات نقل الدم والعمر عند اول عملية نقل للدم وحالة استئصال الطحال بالإضافة الى نوع الدم. وتم الكشف

عن وجود الاجسام المضادة من عدمه في عينات المرضى المشاركين في الدراسة وايضا تم تحديد انواع هذه الاجسام المضادة.

النتائج

وجد ان 11 عينة من أصل 101 عينة مشاركة في الدراسة تحوي اجسام مضادة (10.9%) اغلبهم كان من الاناث (72.7;8%)، وايضا كان 8 من الذي يحملون اجسام مضادة (72.7%) تم استئصال الطحال لديهم سابقا.

من الذين يحملون اجسام مضادة، 7 (63.6%) كانوا يحملون نوع واحد من الاجسام المضادة، و 4 (36.4%) يحملون نوعين من الاجسام المضادة او اكثر.

تم تحديد 6 انواع مختلفة من الاجسام المضادة ثلاثة منهم تعود لنظام Rh واثنان يعودان لنظام Kell اما النوع الاخير فكان يعود لنظام Kidd.

الخلاصة

اظهرت النتائج ارتفاعا في معدل الاجسام المضادة لدى مرضى الثلاسيميا الذين يعتمدون في علاجهم على نقل الدم. وكانت الاجسام المضادة الاكثر شيوعا تلك التي نتتمي الى نظامي Rh و Kell.

ومن اجل العمل على الحد من مثل هذه الاجسام المضادة فاننا نوصي باتباع سياسات تطابق اوسع في نقل الدم لهؤلاء المرضى ولا سيما تطابق مولدات الاجسام المضادة من نظامي Rh و Kell.