

Sudan University of Science and Technology
College of Graduate Studies

**Frequencies of ABO and Rhesus blood group
antigens and phenotypes among Al Halanga
Sudanese Ethnic Group**

نسبة تردد الزمر الوظيفية والنمط الظاهري لأنظمة
ABO، والعامل الريصي في مجموعة الحلقة السودانية

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بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

قال تعالى :

(وَيَسْأَلُونَكَ عَنِ الرُّوحِ قُلِ الرُّوحُ
مِنْ أَمْرِ رَبِّي وَمَا أُوتِيتُمْ مِنَ الْعِلْمِ
إِلَّا قَلِيلًا)

سورة الإسراء الآية ٨٥

Dedication

-To my parents Father (Mokhtar) and Mother (Ihesan) who enlighten my way with their passion, golden wisdom, and blessings.

-to my uncles specially Mohammed.

-To my teachers who always offer an unlimited support and help.

-To my brother and sisters who give the courage, strength and power to go forward in my career.

-To my friends and students in past, present, and future.

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ملخص الدراسة

هذه دراسة وصفية ، تحليلية أجريت في قبيلة الحلقة السودانية هدفت لتحديد نسب تردد الأليل (الانتجين) ، . لقد استغرقت الدراسة ثلاثة شهور (من أبريل الي يوليو، ٢٠٠٧). هدفت الدراسة لتكوين قاعدة معلومات لهذه القبيلة لتحديد مدى التداخل بينها وبين القبائل الاخرى بعد مقارنتها معها. استخدمت الدراسة الزمر الوظيفية للعامل الريصي كعلامات للهوية لتحديد الاصل المشترك المحتمل . أخذت الموافقة من الأشخاص الذين سحب منهم الدم وقد تم أحاطتهم بأهداف البحث. تم تجميع عينات من مائة شخص من القبيلة بحيث لا توجد بينهم صلة قرابة . تم تجميع كل عينة في وعاء سعة ٢.٥ مل يحتوي على مادة مانعة لتجلط الدم (EDTA). تم فحص جميع العينات لمعرفة الزمر الوظيفية للعامل الريصي باستخدام طريقة الشريحة ,ايضا فحصت بطريقة حديثة تسمى جل (مانعة النفاذية) ومن ثم تم تحديد الزمر الوظيفية و تحديد نسب التشابه بين هذه القبيلة و القبائل السودانية والدول الاخرى بواسطة قانون جاكرد للتشابه.

وأظهرت نتائج الدراسة أن نسبة تردد الزمر الوظيفية للدم التابعة لنظام ABO أن الزمرة الوظيفية O كانت الاكثر تردداً بنسبة (47%) تليها A بنسبة (28%) ، ثم B بنسبة (22%) وقد كانت الزمرة الوظيفية AB هي الاقل تردداً بنسبة (3%).

وفي نظام العامل الريصي تبين ان الزمر الوظيفية c,e و D هي الاكثر تردداً وقد كانت نسبها (96%)، (91%) و (82%) على التوالي. وقد كانت الزمر الوظيفية C، E هي الاقل تردداً بنسبة 40%، 15% علي التوالي.

نجد أن هنالك تشابه في الزمر الوظيفية لنظام ABO ونظام العامل الريصي بين القبائل السودانية التي تعيش في منطقة جغرافية واحدة وهذا قد يكون بسبب التزاوج بين تلك القبائل، وأن الاختلاف الذي وجد في بعض القبائل السودانية يمكن أن يكون بسبب الترحال وعدم التقيد بمنطقة جغرافية محددة.

Abstract

This prospective and analytical study, aimed to determine the frequency of ABO, Rh antigen, and phenotypes, among Halanga Sudanese Ethnic group. Also aims to establish ABO, Rh blood group baseline data for this Sudanese tribe to determine the similarity between this tribe and other Sudanese tribes which will be useful in the blood transfusion.

The study was conducted during three months (April to July, 2007), Following informed consent, a total of hundred venous blood samples were collected from unrelated individual into 2.5 ml EDTA containers. All samples were tested for ABO and for common Rhesus antigens by using the slide agglutination techniques, and immune-diffusion gel technique. The antigens and phenotypes were determined. Similarities between this tribe and other Sudanese tribes and with other countries were calculated using Jaccard's coefficient of similarities.

The results obtained showed that, The O group was most common frequently occurred (47%), followed by group A (28%), group B was found (22%) and least common was group AB (3%).

The e, c, and the D antigens were the commonest alleles detected with frequencies of 96%, 91% and 82%, respectively. The C and the E antigens were the least frequent with 40% and 15% frequencies respectively.

There was a marked similarities between the Sudanese tribes that lived in same geographical area this could be due to intermarriage , while the difference that seen in some tribes could be most probably due to the wandering nature of these tribes.

List of abbreviations

Ab: Antibody.

AE1: Anion Exchanger 1.

Ag: Antigen.

AIHA: Autoimmune Hemolytic anemia.

Amt: Ammonium Transporters.

Appro: Approximately.

BFU-E : Burst-Forming Unit, Erythroid.

CFU-E : Colony-Forming Unit, Erythroid.

cDNA: Complementary Deoxyribonucleic Acid.

CHO: Carbohydrates.

CML: Chronic Myeloid Leukemia.

DNA: Deoxyribonucleic Acid

Fy Ag: Duffy Associated Glycoprotein.

GPB: Glycoprotein-B.

H-chain: Heavy Chain.

HDN: Hemolytic Disease of The Newborn.

ID: Immunodiffusion.

IgA: Immunoglobulin A.

IgD: Immunoglobulin D.

IgE: Immunoglobulin E.

IgG: Immunoglobulin G.

IgM: Immunoglobulin M.

ISBT: International Society of Blood Transfusion.

L-Chain: Light chain.

Le: Lewis.

Lu: Lutheran.

LW: Landsteiner and Wiener.

Mep: Methylamine Permease Transporters

mRNA: Messenger ribonucleic acid.

PCR: Polymerase Chain Reaction.

RBC: Red blood cells.

Rh Ag: Rhesus Antigen.

Rh: Rhesus blood group system.

RNA: Ribonucleic acid.

SGP: Sialoglycoprotein.

UK: United Kingdom.

VH: Variable heavy chain.

VL: Variable light chain.

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