

Sudan University of Science & Technology
College of Graduate Studies

**Frequency of ABO, Rhesus (D) and Kell
(Kp^a, Kp^b) antigens and phenotypes in Albataheen
Sudanese tribe**

تردد الزمر الوظيفية والنمط الظاهري لأنظمة العامل
الريصي ، ABO و Kell في قبيلة البطاحين السودانية

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Dedication

**To my parents,
Brothers, Sister,
All
Families, Teachers
And
Students.**

Acknowledgement

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الخلاصة

هذه دراسة وصفية تحليلية هدفت لدراسة تردد الزمر الوظيفية والنمط الظاهري والوراثي لنظام الدم Kell والنمط الظاهري لنظام الدم ABO و العامل الريصي (D). أجريت هذه الدراسة على قبيلة البطاحين في محلية شرق النيل خلال فترة ثلاثة أشهر من إبريل حتى يوليو 2007. بعد اخذ الموافقة تم تجميع 100 عينة في وعاء 2.5 مل يحتوي علي مادة مانعة للتخثر EDTA من أشخاص لا تربطهم صلة قرابة.

تم فحص العينات لمعرفة الزمر الوظيفية لنظام Kell بواسطة Gel technique ولنظام الدم ABO و العامل الريصي (D) تم استخدام طريقة التلازن، أما بالنسبة للعينات سالبة العامل الريصي تم استخدام Indirect coomb's technique أو D^u method. أوضحت الدراسة أن الزمرة الوظيفية O هي الأكثر شيوعاً بنسبة (%) 47 ثم A بنسبة (%) 26 ، ثم B بنسبة (%) 21 بينما الزمرة الوظيفية AB هي الأقل ترددا بنسبة (%) 6 وكان العامل الريصي (D) أكثر ترددا بنسبة (%) 96 .

في نظام الدم Kell وجد أن الزمرة الوظيفية Kp^b هي الأكثر شيوعاً بنسبة (%) 100 بينما الزمرة الوظيفية Kp^a هي الأقل ترددا بنسبة (%) 1. والنمط الظاهري $Kp(a-b)$ هو الأكثر ترددا بنسبة (%) 99 $Kp(a+b)$ ، هو الأقل ترددا بنسبة 1% أما النمط الظاهري $Kp(a+b)$ لم يوجد.

وكان النمط الوراثي Kp^b/Kp^b بنسبة (%) 99 و Kp^a/Kp^b بنسبة (%) 1 أما النمط الوراثي Kp^a/Kp^a لم يوجد.

تمت مقارنة النتائج المتحصلة في هذه الدراسة مع نتائج بعض القبائل السودانية في نفس الانظمة فوجد أن هنالك تشابه في بعض الزمر الوظيفية لنظام الدم ABO و العامل الريصي (D) مع قبائل العركيين، الشكرية، الدناقلة والشايقية ووجد أن هنالك اختلاف مع قبائل الحلاويين، الميسيرية والنوبة، أما في نظام الدم $Kp^a \& Kp^b$ (Kell) فلم توجد دراسة سابقة في القبائل السودانية.

نخلص الي أن التشابه بين القبائل السودانية التي تقطن في منطقته واحده ناتج عن التداخل والتزاوج بين هذه القبائل. بينما نجد أن القبائل التي تبعد عن بعضها البعض جغرافيا يوجد بينها بعض الاختلاف.

Abstract

This descriptive, prospective and analytical study aimed to determine the frequencies of Kell antigens (Kp^a , Kp^b), phenotypes and genotypes, ABO blood group system phenotypes and Rhesus (D) factor.

The study was conducted in Albataheen Sudanese tribe during the period of three months from April to July 2007, following informed consent, a total of 100 venous blood samples were collected into 2.5 ml EDTA container from unrelated individuals. The red blood cells were tested for Kell antigens (Kp^a , Kp^b) by using the particle gel immunodiffusion, for ABO blood group system and Rhesus (D) antigen using saline agglutination technique and D^u for the negative results.

The study showed that the O phenotype was commonest with the frequency of (47%), followed by A (26%), B (21%) and AB (6%). The Rhesus (D) was high frequent (96%).

In Kell blood group system the Kp^b was the commonest antigen with the frequency of (100%), while the Kp^a antigen was low frequent (1 %). The phenotype $Kp(a-b+)$ was the high frequency (99%), $Kp(a+b+)$ was low frequent (1%) and the phenotype $Kp(a+b-)$ was not found. The genotype Kp^b/Kp^b was high frequent (99%), Kp^a/Kp^b was low frequent (1%), and the genotype Kp^a/Kp^a was not found.

The result of this study were compared with the results of other Sudanese ethnic group in the same system and were found that there were similarities in some ABO blood group and Rh (D) factor with the Arrakein, Alshokria, Danagala and Shaigia and there were difference with the Halaween, Miseria and Nuba, while in the Kell blood group system (Kp^a & Kp^b) there was no previous study in Sudanese ethnic group.

In conclusion there was similarity between Sudanese tribes that lived in same area and this result from interaction and intermarriage between them, while there were differences between the tribes that lived in different geographical area.

List of Abbreviations

C3	: Complement-3.
DAT	: Direct Antiglobulin Test.
EDTA	: Ethylene-Diamine-Tetra-Acetic acid.
Fy	: Duffy blood group system.
HDN	: Haemolytic Disease of the Newborn.
IgA	: Immunoglobulin A.
IgG	: Immunoglobulin G.
IgM	: Immunoglobulin M.
ISBT	: International Society of Blood Transfusion.
Lu	: Lutheran blood group system.
LW	: Landsteiner and Wiener.
Rh	: Rhesus blood group system.
RBCs	: Red Blood Cells.
LISS	: Low Ionic Strength Solution.

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