

THE ASSOCIATION BETWEEN ABO/RH/KELL BLOOD GROUPS PHENOTYPES AND DUFFY BLOOD GROUP GENOTYPES WITH ACUTE LEUKAEMIA

Aljuhani SH^{1,2}, Mirza A^{2,3}, Bawazir W², Badawi M¹, Hindawi S¹, Saka M³

¹ King Abdulaziz University Hospital, ² Faculty of Applied Medical Science ³ King Fahd Medical Research Centre King Abdulaziz University, Jeddah, KSA.

HAEMATOLOGY AND BLOOD TRANSFUSION MEDICINE



INTRODUCTION Leukaemia is the 6th cancer that cause of death in Saudi Arabia in both genders with a mortality rate of 3.1% while its incidence appears slightly higher in males than females (1). Acute leukaemia is the most common type of leukaemia that affects all ages and genders (2,3). Different studies have linked different epidemiological factors to leukaemia like gender and race (4). However, there are no enough studies looked at the association between different blood groups and leukaemia.

OBJECTIVES Determine if there is any significant relation between ABO/Rh/Kell blood phenotypes and Fy blood genotypes with acute leukaemia in Saudi Arabia; this could be used as an epidemiological marker to identify any high-risk group in the population.

METHODS The study was divided into two sections:

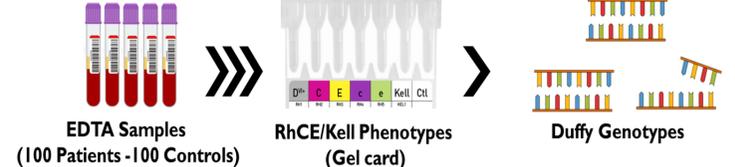
1 Retrospective study: ABO/RhD phenotypes.

Data Collection



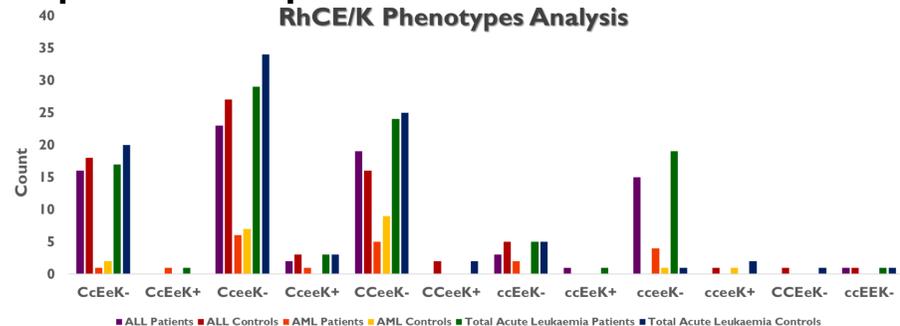
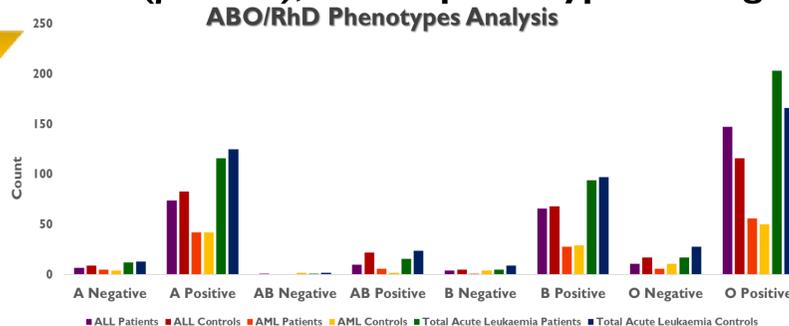
2 Prospective study: RhCE/Kell phenotypes and Fy genotypes.

Sample Collection Serology Test Single Specific Primer-PCR

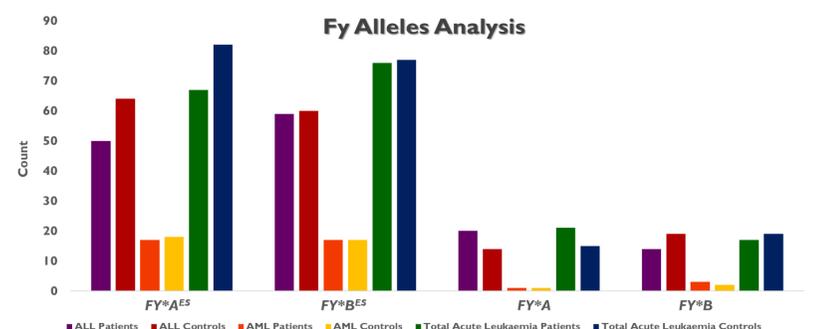
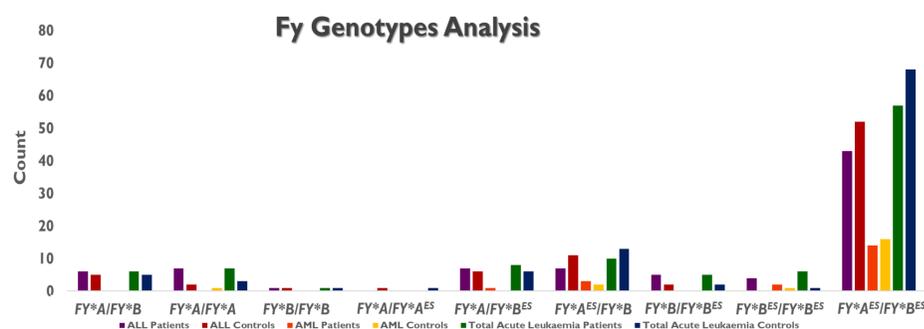


RESULTS Data from 320 ALL and 144 AML patients were collected.

Chi-square test was performed to examine the relation between ABO/Rh/Kell phenotypes and Fy genotypes with acute leukaemia. No significant association was found with ABO/RhD phenotypes. The association between RhCE/K phenotypes with acute leukaemia and ALL were significant ($p=0.01$), cceeK- phenotype was higher in patients compared with controls.



There was a significant relation between null Fy (FY^*A^{ES}/FY^*B^{ES}) and acute leukaemia ($p=0.02$). For FY^*A allele analysis, FY^*A positive patient were more likely to be ALL ($p=0.04$). FY^*A^{ES} allele analysis showed, FY^*A^{ES} negative patients were more likely to be affected with acute leukaemia ($p=0.007$) and with ALL ($p=0.02$).



DISCUSSION Blood groups might be one of the factors that can be investigated in cancer, different studies showed an association between blood groups and cancers (4). In this study we tried to focus on acute leukaemia. Our data was similar to previous studies which showed no relation between ABO/RhD blood groups phenotypes with acute leukaemia (4,5), completely contrary to what other studies found in solid tumours (6). RhCE/Kell phenotypes and Fy genotypes showed associations with acute leukaemia, no previous studies looked at these relations.

CONCLUSION RhCE/K phenotypes and Duffy genotypes might be used as a promising marker to predict acute leukaemia high risk group from early stage and follow up until they pass the risk age.

BIBLIOGRAPHY

- 1- Globocan, (2018). Global Cancer Observatory. Retrieved from <https://gco.iarc.fr/>
- 2- Ladines-Castro, W., Barragán-Ibañez, G., Luna-Pérez, M., Santoyo-Sánchez, A., Collazo-Jaloma, J., Mendoza-García, E., & Ramos-Peñafiel, C. (2016). Morphology of leukaemias. Revista Médica Del Hospital General De México, 79(2), 107-113.
- 3- ALBakr, R., & Khojah, O. (2014). Incidence Trend of The Leukemia Reported Cases in The Kingdom of Saudi Arabia, Observational Descriptive Statistic From Saudi Cancer Registry. International Journal Of Biomedical Research, 5(8), 522.
- 4- Vadivelu, M., Damodaran, S., Solomon, J., & Rajaseharan, A. (2004). Distribution of ABO blood groups in acute leukaemias and lymphomas. Annals Of Hematology, 83(9).
- 5- H. Ghali, H., Nayeef, A., Hameed, A., & Fawzi, G. (2017). Relationship between ABO and Rh Blood Groups with Childhood Acute Lymphoblastic Leukemia. IOSR Journal Of Research & Method In Education (IOSRJME), 07(02), 86-89.
- 6- Rummel, S., & Ellsworth, R. (2016). The role of the histoblood ABO group in cancer. Future Science OA, 2(2).

