

ABO/rhesus blood group systems are not clinical indicators of male baldness

Ayinde TO¹, Ojulari LS¹, Sanni MA², Afodun AM³, Jimoh-AbdulghaffaarHO¹, Ayinla MT¹, Abdulazeed FI⁴, Abdulkareem S⁵, Abdulrahim HA⁶, Samotu K¹

¹Department of Physiology, University of Ilorin, Nigeria

²Kwara State Specialist Hospital, Sobi, Ilorin, Kwara State, Nigeria

³Department of Haematology and Blood transfusion, University of Ilorin, Nigeria

⁴Department of Clinical Pharmacy & Pharmacy Practice, University of Ilorin, Nigeria

⁵Department of Anatomy, University of Ilorin, Nigeria

⁶Department of Medical Biochemistry, University of Ilorin, Nigeria

Abstract

Background: Several disease entities have been linked to the ABO/Rh blood group systems. Baldness or alopecia is the partial or complete lack of hair on the head and/or body. Major advances have been achieved in understanding principal elements of the androgen metabolism involved in the pathogenesis of alopecia, but not much preliminary work has been done in its relationship to blood types.

Aim: This study is aimed to determine if there is any association between blood types and male baldness.

Methods: 400 male subjects (25-60 years) at Sobi Specialist Hospital Alagbado, Ilorin, Kwara State, Nigeria were recruited into the study (200 for control and 200 for baldness). Blood sample was collected from each subject for blood grouping estimation, following the completion of a questionnaire containing information about baldness and haematological profile.

Result: The distribution of phenotypic frequencies of ABO group in the control samples were 26.0%, 28.0%, 4.0% and 42.0% for groups A, B, AB and O, respectively, while 92.0% of the subjects were Rh (D) positive and 8.0% Rh(d) negative. And for the baldness, they were 26.0%, 26.0%, 4.0% and 44% for A, B, AB, and O respectively; while Rh (D) positive were 94.0% and Rh (d) negative were 6.0%. The overall result is statistically insignificant ($P > 0.05$) using Pearson Chi-square.

Conclusion: The result reflects an absolute parallel relationship between baldness and ABO/Rhesus blood group systems. Thus, ordering for blood group assessment during routine hair clinic as part of ancillary investigation should be discouraged, except if other interests arise.

Keywords: ABO, rhesus, blood group, baldness

Introduction

Hair is considered an essential part of overall identity for an individual, especially for women, for whom it often represents femininity and attractiveness. Men typically associate a full head of hair with youth. Although they may be aware of pattern baldness in their family, many are uncomfortable talking about the issue. Androgenetic alopecia, also referred to as male-

pattern hair loss or common baldness in men¹, and as female-pattern hair loss (FPHL) in women, affects at least 50% of men by the age of 50 years, and up to 70% of all males in later life². The commonest form of which is androgenic alopecia which has a distribution of more than 95% in men with hair thinning³. Hair loss is therefore a sensitive issue for both sexes.

The International Society of Blood Transfusion has so far discovered 33 blood group systems. And apart from ABO and Rhesus systems, several other kinds of antigens have been found on the membranes of red cell^{4,5}. Since the discovery of the ABO blood groups by

Corresponding Author: Ojulari Lekan Sheriff
Department of Physiology, Faculty of Basic Medical
Sciences, University of Ilorin, Ilorin, Nigeria
+2348032429067
ojularis@yahoo.com

Landsteiner^{6,7}, several links have been established between ABO groups and some disease entities⁸. In the last few decades, studies have suggested that ABO blood groups, particularly the non-O blood groups, are associated risk factor of coronary artery disease⁹. Researchers have also shown a strong impact of gender on ABO effect, women with a non-O blood group having a 5-fold increased risk of developing vascular thromboembolism (VTE) recurrence, while B blood group raised this risk by nearly 3 times. Some form of infections have been found to be higher in Rh positive individuals of blood groups AB and A than that of Rh negative counterparts¹⁰. Recent studies have suggested ABO blood type locus as an inherited predictor of thrombosis, cardiovascular risk factors, and myocardial infarction¹¹. The association of non-O blood groups with cardiovascular diseases including myocardial infarction (MI) has also been shown in several studies¹². This study is aimed to determine the relationship of blood types to occurrence of male baldness.

Materials and Methods

Test subjects

Four hundred (400) male subjects between the ages of 25 and 60 years at Sobi Specialist Hospital Alagbado, Ilorin, Kwara State, Nigeria were recruited into this study. The recruitment criteria are:

- i. All were males between the ages of 25 and 60 years.
- ii. All the subjects agreed to participate in the research following detailed explanation.
- iii. None had disease(s) that are related to hair loss (baldness).
- iv. None is on medication associated side effect of hair loss.
- v. Nil positive history of baldness in family for control subjects

The subjects were grouped into two, group 1 Control (non-bald males, n=200) and group 2 (bald males n=200). A questionnaire was given to each subject to complete. The contents of the questionnaire included: Age, religion, state, life style, family history of baldness, features of chronic illness, drug history etc.

Experimental process

The subjects were then made to sit comfortably in a relaxed atmosphere for about 10mins. A tourniquet was

then tied around the upper arm to make the veins at the cubital fossa more prominent. The skin above the targeted vein was cleansed with spirit swab to disinfect the spot, and a sterile needle connected to syringe was carefully inserted into the vein to draw 2ml of whole blood into the syringe. The tourniquet was released and the needle was removed. A dry cotton wool was then placed on the area with the arm held up to encourage haemostasis. Blood collected from each subject was drained immediately into the EDTA bottle and labelled accordingly for onward determination of blood group.

Blood group determination

Blood group was determined using Anti-serum A, Anti-serum B, and Anti-serum D reagent. One to two drops of each anti-serum were dropped on three different wide-spaced spots on a white tile, following which one to two drops of blood from the EDTA bottle were dropped on the different anti-sera; the blood and the reagents were then mixed together by rocking the tile gently. After a few minutes, blood coagulation was observed based on antigens-antibody reaction.

Statistical Analysis: The frequency values of the measured variables were determined and percentage calculated using SPSS version 20. Statistical comparison was done using Pearson Chi-Square, and level of statistical significance was considered as $p < 0.05$.

Results

The distribution of phenotypic frequencies of ABO group in the control samples were 26.0%, 28.0%, 4.0% and 42.0% for groups A, B, AB and O, respectively, while 92.0% of the subjects were Rh (D) positive and 8.0% Rh(d) negative. And for the baldness, they were 26.0%, 26.0%, 4.0% and 44% for A, B, AB, and O respectively; while Rh (D) positive were 94.0% and Rh (d) negative were 6.0%. From this result, it can be observed that blood group B of the control (28.0%) has a higher frequency than blood group B of the baldness (26.0%). In the same vein, blood group O of the baldness is higher than blood group O of the control subjects. It could also be observed that blood group AB (Rh) negative has no representation in all the subjects examined. This does not mean that AB negative is protective against male baldness, but rather a reflection of the usual ABO blood group frequency distribution.

It is of interest to also note that the overall frequency of blood group O was higher than any other blood group from control or baldness and that Rh positive was more preponderant than Rh negative blood groups. Above all, some borderline increase are noticed however, the overall result is statistically insignificant ($p > 0.05$).

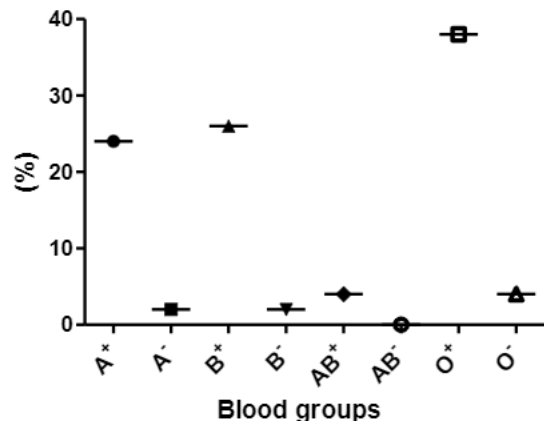


Figure 1: shows the frequency in percentage (%) of blood groups in non-bald men

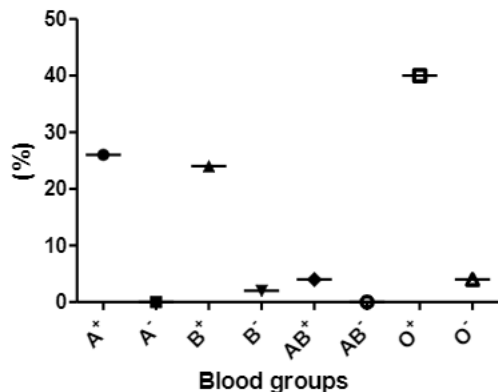


Figure 2: shows the frequency in percentage (%) of blood groups in bald men

Discussion

In the present study, there was 100% concordance in the frequencies of the blood groups (B-, AB+ and O-) of the baldness when compared with that of control. While slight differences were recorded in blood groups (A+, B+, and O+) of the baldness when compared with that of control. Our observations are in tandem with the previous available information on ABO blood group distribution among Nigerian populations with a reflection of ABO blood group O being highest and Rh(D) positive higher than the Rh (D) negative¹³.

The import of this result reflects an absolute parallel relationship between baldness and ABO/Rhesus blood group systems. Thus, ordering for blood group assessment during routine hair clinic as part of ancillary investigation should be discouraged, except if other interests arise. This is in contrast to the findings of Tejinder Bhatti in 2013 who reported that people with A Rh (D) positive blood group are prone to alopecia. To the best of our knowledge, no work has been reported that linked a particular blood group to baldness in Nigeria. However, the present evidence appears to be sufficiently suggestive to warrant further research on the matter, perhaps with larger population from various geographical distributions.

References

1. Jaworsky C, Kligman AM, Murphy GF. Characterization of inflammatory infiltrates in male pattern alopecia: implications for pathogenesis. *Br J Dermatol*. 1992;127 (3):239-46
2. Norwood OT. Male pattern baldness: classification and incidence. *South Med J*. 1975;68 (11):1359-65
3. Proctor PH. Hair-raising. The latest news on male pattern baldness. *Advance for nurse practitioners*. 1999; 7(4):39-42,83.
4. Kumar NCVM, Nadimpalli M, Vardhan VR, Gopal SDVR. Association of ABO blood groups with Chikungunya virus. *Virology Journal*. 2010; 7:140
5. Daniels G. *Human Blood Groups*. 3rd edition - Daniels - Wiley Online Library. 2013 Online ISBN: 9781118493595 .
6. Greenwell P. Blood group antigens. *Molecules seeking a function*. *Glycoconjugate J* 1997;14:159-73.
7. Avent ND, Reid ME. The Rh blood group system: a review. *Blood*. 2000;95 :375-87.
8. Cserti CM, Dzik WH. The ABO blood group system and *Plasmodium falciparum* malaria. *Blood*. 2007;110 (7): 2250-2258
9. Erikssen J, Thaulow E, Stormorken H, Brendemoen O, Hellem A. ABO blood groups and coronary heart disease (CHD). A study in subjects with severe and latent CHD. *Thrombosis and Haemostasis*. 1980; 43(2):137-40
10. Mitra R, Mishra N, Rath GP. Blood Groups Systems. *Indian J Anaesth*. 2014;58(5): 524-528.
11. Afsar B, Turkmen K, Covic A, Kanbay M. An Update on Coronary Artery Disease and Chronic Kidney Disease. *Int J Nephrol*. 2014;
12. Reilly JP, Meyer NJ, Shashaty MGS, Feng R, Lanken PN, Gallop R, et al. ABO Blood Type A Is Associated With Increased Risk of ARDS in Whites Following Both Major Trauma and Severe Sepsis. *Chest*. 2014; 145(4): 753-761.
13. Iyiola OA, Igunnugbemi OO, Bello OG. Gene frequencies of ABO and Rh(D) blood group alleles in Lagos, South-West Nigeria. *Egyptian Journal of Medical Human Genetics*. 2012; 13(2): 147-153.