Prevalence of Blood Group A Subgroups in Fayoum University Hospital Blood Bank :

Implications on Transfusion Practice

Thesis

Submitted for Partial Fulfillment of Master

Degree in Clinical and Chemical Pathology

By

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ABSTRACT

Background: The A blood type contains about 20 subgroups, of which A2 are the most common (over 99%). Subgroups of A antigen weaker than A2 are not frequent. The distinction between the A1 and A2 subgroups is usually made by using anti-A1. Although both subgroup cells react with anti A antiserum, anti-A1 will agglutinate A1, but not A2, red cells. A2 and A2B subgroups might have Anti-A_1 antibody which reacts at a temperature below 25 °C and do not pose problem in transfusion. However, their presence may cause discrepancies in forward and reverse grouping. These antibodies become clinically significant if they react at 37 C and may lead to hemolytic transfusionreaction.

Aim of the study: to determine the prevalence of A1 and A2 blood subgroups and detect anti A1 antibodies in the studied population in order to assess their implication in transfusion practice.

Subjects and methods: Blood samples were collected from 10,662 donors and recipients attending Fayoum University Hospital Blood Bank over a period of eight months. Analysis of ABO and Rh-D blood groups using column-gel agglutination techniquewasperformed for all samples. Subgrouping using anti-A1 lectinwas performed for bloodsamples positive for A and AB blood groups. Anti-A1 antibodies detection using AHG(Coombs) gel micro-column was done for samples positive for A2 and A2B blood subgroups.

Results: The frequency of blood group A was 40.1% , 27.1% for group O, 25% for group B and 7.8% for group AB. The frequency of A subgroups in all the studied population was 39.8% for subgroup A1, 0.3% for subgroup A2, 6.3% for subgroup A1B and 1.5% for subgroup A2B. Out of the total study group, A antigen was present in 5110 subjects (4274 group A and 836 group AB). Distribution of A subgroups in the study population with A antigen was 83% for A1 subtype, 0.7% for A2 subtype, 13.2% for A1B subtype while A2B subtype was found in 3.1%. Total A1 antigen (A1 and A1B subgroups) was present in 96.2% of the 5110 study subjects with A antigen while total A2 antigen (A2 and A2B subgroups) was present in 3.8%. A1 antigen was present in 99.2% of subjects with A blood group and A2 antigen was present in 0.8%. While in subjects with AB blood group, A1 antigen was present in 80.75% of and A2 antigen was present in 19.25%. Anti-A1antibodies were not detected in any of the blood samples with A2 and A2Bsubgroups.

Conclusion: Despite the large population sample of this study, A2 and A2B are rare subgroups and were only found in 195/10,662 (1.8 %) of studied samples. The frequency of A2 antigen was significantly higher in AB blood group (19.25%) compared to (0.8%) in blood group A. Anti A1antibodies were not detected in any of the 195 samples with A2 and A2B bloodsubgroups.

Keywords: ABO subgroups, A1 subgroup, A2 subgroup, anti-A1 antibodies.