

## BRIEF COMMUNICATION

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# Relation of Factor VIII and IX Inhibitors with ABO Blood Groups in 150 Patients with Haemophilia A and B

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## ABSTRACT

Many investigations have proved relations between ABO blood groups with some diseases and factor VIII and von willebrand level in plasma. In this study we investigated a relation between ABO blood groups and factor VIII and IX inhibitors in 102 patients with haemophilia A and 48 patients with haemophilia B. The assay of inhibitor was done by Bethesda method. There were no relation between ABO blood groups and factor VIII and IX inhibitors.

**Key words:** ABO Blood Groups; Factor VIII and Factor IX inhibitor; Haemophilia

## INTRODUCTION

Since 1960, many investigations have reported an association between ABO blood groups and risk of some diseases such as: heart disease,<sup>1,2</sup> atherosclerosis,<sup>3,4</sup> and venous thromboembolic disease.<sup>5,6</sup> An association between the ABO blood groups and the plasma levels of factor VIII and vonWillebrand Factor (vWF) has also been reported.<sup>7-9</sup> Due to the absence of any study on the relation between factor VIII and factor IX inhibitors in patients with haemophilia A and B and ABO blood groups, we decided to investigate any possible relation between these inhibitors and the above-mentioned blood groups in haemophilia.

Over all 150 patients participated in this survey (102 patients with haemophilia A and 48 patients with haemophilia B). In 102 patients with haemophilia A, 44

patients (43.1%) had severe, 28 patients (27.5%) had medium, and 30 patients (29.4%) had mild haemophilia A. Minimum and maximum ages of patients were 3 and 80 years respectively and their mean age was  $34.86 \pm 14.75$  SD (years).

Haemophilia B group included 22 patients with severe (48%), 18 patients with medium (37.7%) and 8 patients with mild type (16.5%). The minimum and maximum ages of patients were 4 and 53 years old respectively and their mean age was  $21.35 \pm 11.8$  SD (years). The participants' populations were from northeastern Iran.

We examined whole blood specimens for blood group serology. After mixing blood samples with trisodium citrate 3.2 g/dl (0.109 M) at ratio of 1:9, blood samples were centrifuged with 2000 g for 15 minutes to gain Poor Platelet Plasma (PPP). Then we conducted a primary test APTT<sub>mix</sub> on a mixture of equal volume of patients' plasma and pooled plasma (1:1). Then incubation mixtures were prepared for all samples including 0.2 ml pooled plasma and 0.2 ml patient's plasma; and after 2 hours incubation at 37° C,

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Bethesda assay was evaluated according to references.<sup>10</sup> Factor IX and VIII deficient plasmas were prepared commercially (*Diagnostica Stago, France, Paris*). Reference interval for inhibitor less than 0.5 B.U. (Bethesda Unit) was calculated negative.

The results showed that among 102 patients with haemophilia A, 31 patients (30.39%) had A group, 24 patients (23.52%) had B group, 10 patients (9.8%) had AB group, and 37 patients (36.27%) had O group. Among them 20 patients (19.6%) had factor VIII inhibitor. In group with inhibitor, 6 patients (19.4%) had A group, 5 patients (20.8%) had B group, 2 patients (20%) had AB group, and 7 patients (18.9%) had group O. Chi-square tests showed no relation between ABO blood groups and factor VIII inhibitor (P.V.=0.998).

Among haemophilia B, 7 patients had A group, 11 patients had B group, 3 patients had AB group, and 27 patients had O group. After testing, it was revealed that 3 patients (6.3%) had factor IX inhibitor. 7 patients had A group in which only one had factor IX inhibitor (14.3%), 11 patients had B group that only one of them had inhibitor (9.1%), 3 patients had AB group of whom none had inhibitor, and finally 27 patients had O blood group in whom only one patient (3.7%) had factor IX inhibitor. Chi-square tests showed there are no relations between ABO blood groups and factor IX inhibitor (P.V.=0.7). SPSS 11.5 analyzed all data.

The data about inhibitor status in haemophilia A and B have been cited in many articles, and it is estimated that about 20-30 % of patients with haemophilia A and about 5% of patients with haemophilia B have factor VIII and IX inhibitors respectively. Our data about inhibitor are nearly similar to inhibitors' status in other regions. As we do not find any study about relation of ABO blood groups and inhibitors in haemophilias, so it may be unique and first study in this regard. Although we could not find any relation between them, but further investigation with larger groups or meta-analysis may confirm this lack of association. As severity of haemophilia in study group can affect the estimates of inhibitor and also with

regarding other characterizations, evaluation of this relation in patients with severe haemophilias may be needed.

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