THE ASSOCIATION BETWEEN HUMAN GIARDIASIS AND ABO AND RHESUS BLOOD GROUPS

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Abstract

Giardia lamblia is considered as one of most parasites that causes diarrhea in human. The present study aimed to investigate the relationship between giardiasis and ABO and Rhesus blood groups among local population. ABO and Rhesus blood groups were determined for 94 patients who gave positive result for Giardia infection. The ABO and Rhesus blood groups of these patients were compared with those of 196 non infected patients. The frequency of ABO and Rhesus blood groups in infected patients does not differ significantly from those in non infected patients. ABO and Rhesus blood groups may not interfere with Giardia infection.

Introduction

Giardia lamblia (Synonymous Giardia intestinalis or Giardia duodenalis) accounts for a considerable proportion of diarrheal illness world-wide [1], and infects more than 20 million people [2]. The disease becomes chronic in approximately 15% of infected individuals [3]. Most recent report about intestinal parasites in Baghdad province revealed that 4.9% of the city population (of different ages) who have gastrointestinal complains are infected with this
parasite with highest prevalence among children below 10 years old [4]. It is well known that cell mediated and humeral immune response play a major role in protection of the body against the infection [5]. Furthermore, protein-calorie malnutrition has been associated with prolonged giardiasis in tropical countries [6] perhaps because of co-existing suppression of immune mechanism. Interestingly, some genetic factors may participate in this protection, since some studies with *Giardia muris* in mice shows the potential importance of these factors [5]. The role of blood group A as predisposing factor for *Giardia* infection is still a controversial issue. Many reports have showed a statistical significant surplus of blood group A and giardiasis patients [7, 8, 9, 10] whereas, other studies did not find such correlation [5, 11, 12]. This study was conducted to investigate this relationship among local population of Baghdad city.

### Patients and Methods

Patients with different gastrointestinal complains attending outpatient clinic of Al-Karama Teaching Hospital (Baghdad) during the period from January 1999 to November 2000 were used for this study. Each patient was examined clinically, and a direct smear was made from a stool sample and examined microscopically. Ninety four patients (median age of 28, range = 1-58 year) from either sex who gave positive result for Giardia infection (cyst and/or trophozoite) were chosen. ABO and Rhesus blood groups were determined by standard haemagglutination technique (ANTI-ABO monoclonal DiaMond Jordan slide and tubetest usein Vitro Diagnostic Kit).

The ABO and Rhesus blood groups of these patients were compared with those of 196 patients who attended the same hospital but without any gastrointestinal complain. The Chi square was used to compare the frequency of ABO and Rhesus blood groups between infected and non infected population. Statistical probability of p≤0.05 was considered significant.

### Results and Discussion

Table (1) Shows the frequency of ABO and Rhesus blood group among infected an non infected population. The frequency of ABO blood groups in patients with giardiasis does not differ significantly from population data. Twenty six patients were typed as blood group A (expected 29), 27 as B blood group (expected 20), 9 as AB blood group (expected 6) and 32 as O blood group (expected 39). Also, there was no significant difference in the frequency of Rh-factor between infected and non infected population, as 75 patients were typed as Rh positive (expected 77).

<table>
<thead>
<tr>
<th>Blood group/ Rhesus factor</th>
<th>Infected</th>
<th>Non infected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>A</td>
<td>26</td>
<td>27.7</td>
</tr>
<tr>
<td>B</td>
<td>27</td>
<td>28.7</td>
</tr>
<tr>
<td>AB</td>
<td>9</td>
<td>9.6</td>
</tr>
<tr>
<td>O</td>
<td>32</td>
<td>34.0</td>
</tr>
<tr>
<td>Rh*</td>
<td>75</td>
<td>79.8</td>
</tr>
</tbody>
</table>

There is no doubt that genetic factors can play a major role in the protection of the body against some protozoal infection. This role of genetic factors is especially obvious in blood parasites; for example, Duffy blood group system confers resistance of RBCs to penetration by *Plasmodium vivax* [13], and the presence of significance linkage of symptomatic visceral leishmaniasis to a region of chromosome 22q12 (LOD score 3.5) in a genome [14]. This importance of genetic factor is not so distinct in intestinal protozoa.

The suggested explanation of the predilection of *Giardia lamblia* to infect group A population is the similarity between *Giardia* surface antigen and A antigen of RBC [15]. This explanation will no longer be valid when we know that *Giardia lamblia* has the ability to vary it's surface protein which is some kind of genetic variation [16].

Despite the absence of significance difference in frequency of ABO between infected and non infected populations in the present study, yet we can see an increase in number of AB and B groups and decrease in number of A and O groups. On the other hand, Giboda and Bernasovsky [17] in Slovakia reported a tendency towards an increased frequency of group B in *Giardia* infected gipsy children and towards group A of non-gipsy children, but the differences were not statistically significant.
These variations in results might indicated that there is no correlation between ABO and Rhesus blood groups and *Giardia lamblia* infection.

**References**


