GENDER-BASED DIFFERENCES IN THE BLEEDING TIME AND CLOTTING TIME AND THEIR RELATIONSHIP WITH THE BLOOD GROUPS

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ABSTRACT

BACKGROUND
The clinical significance of the ABO blood group system extends beyond transfusion medicine. It is remarkable that 100 years after the work of Karl Landsteiner (1900) on blood grouping, the scene is different and numerous studies have been carried out on association of blood groups with diseases. But, very less research is done on association of blood groups with other haematological parameters like bleeding time and clotting time.

The aim of the present study is to establish a relationship between blood groups and bleeding time, clotting time and to observe if there is any gender-based differences of the same.

MATERIALS AND METHODS
In order to add to the existing knowledge on the subject, we studied 150 normal healthy subjects (Medical students) to find out the probable relationship between Blood groups and gender with bleeding time & clotting time. Blood group determination was done by mixing the sample of blood with antisera A and B and Anti D antisera and was confirmed by looking for clumping of RBCs under the microscope. Bleeding time was estimated by Duke Method and clotting time was estimated by capillary tube method.

RESULTS
In our study, we observed that the O blood group individuals are having greater bleeding time and clotting time than the non-O blood group individuals. Females had more bleeding time and clotting time than males.

CONCLUSION
So, through this research, the fact that there is a gender-based difference in the Bleeding time and Clotting time is proven. The relationship between bleeding time and clotting time with the blood groups was also studied.

KEYWORDS
Bleeding Time, Clotting Time, Blood Groups.
MATERIALS & METHODS
This observational study was conducted in the Department of Physiology in Katuri Medical College. In our institution, it is mandatory for all the medical students to do their blood grouping, bleeding time and clotting time during their 1st year of study as a part of their training program. Informed consent was taken from every student participating in the study. The available detail reports of 215 medical students were analysed in respect of age, sex, blood group, bleeding time and clotting time.

Inclusion Criteria
150 Medical students from First year MBBS.

Exclusion Criteria
Students with any history of bleeding disorders and who are using Drugs like NSAIDs are excluded from the study.

Statistical Analysis
Statistical analysis was done with appropriate statistical tools. Blood grouping, bleeding time and clotting time were estimated. Mean, Standard deviation was calculated. P value was calculated. One way Chi square test and correlation test are used to analyse the data. IBM-compatible Statistical Package for the Social Sciences (SPSS) version 20.0 was used for Statistical analysis. P-value at <0.05 was considered significant and at <0.001 was considered highly significant, while at >0.05 was considered not significant. The qualitative data were expressed as number (%), while the continuous quantitative data as mean ± standard deviation (SD).

Benefits
1. Having a non-O blood group is associated with an increased risk of VTE (17) and that the addition of thrombophilia increases the thrombotic risk conferred by non-O group alone by almost 3-fold. This simple information may help to identify groups of patients at high risk suitable for counselling, further testing or closer monitoring.
2. The O blood group individuals can be educated on the role of blood group in the epistaxis and proper preventive measures can be taken. Blood group determination was done by mixing the sample of blood with antisera A and B and Anti D antisera and was confirmed by looking for clumping of RBCs under the microscope. Bleeding time was estimated by Duke Method and clotting time was estimated by capillary tube method.

Dukes Method
It is convenient and commonly used method. The stop watch is set at zero. The tip of the finger is cleaned thoroughly with spirit and allowed to dry. A puncture is made deep enough (about 3-4 mm) to ensure free flow of blood without squeezing. Immediately the stop watch is started. The time of puncture of the finger is referred as zero time. 30 seconds later the escaping blood is dried on the edge of a clean piece of filter paper. This procedure is repeated every 30 seconds using a fresh area of the paper until bleeding ceases and no further blood spot appears on the filter paper. Therefore, each blot of blood on the filter paper represents 30 seconds flow of blood. The total number of blood spots on the filter paper are counted and multiplied by ½. This will give the bleeding time in minutes. Normal bleeding time by this method is 2-6 minutes.

Capillary Glass Tube Method
This is the most convenient and commonly used method in practice. The tip of the finger is cleaned thoroughly with spirit and allowed to dry. A puncture is made deep enough (about 3-4 mm) to ensure free flow of blood without squeezing. The time of puncture of the finger is referred as zero time. When a large drop of blood has collected, the capillary tube will be inserted into the drop holding tube such that its other end will be at a lower level. Blood will flow rapidly into the capillary tube. The capillary tube must be held in between the palm of the hand, so as to maintain it under body temperature. At the end of one minute, break off about one centimetre of the tube from one end and then notice if a thread of fibrin connects the broken ends of the tube. If there is no fibrin thread, repeat the procedure every 30 seconds till a fibrin thread appears. The appearance of fibrin thread of about 5 mm length indicates that the blood has clotted. The total time taken from the time of puncture (Zero time) till the formation of a fibrin thread is the clotting time. Normal value of clotting time by this method is 3-8 minutes. Finally bleeding time and clotting time of different blood groups were compared and statistical analysis was done.

RESULTS
In our study, we observed that the O blood group individuals are having greater bleeding time and clotting time than the non-O blood group individuals. There was statistical significance among the ABO groups with clotting time below 4 minutes and above 4 minutes showing p=0.001. Again there was statistical significance among the ABO groups with bleeding time below 5 minutes and above 5 minutes showing p=0.002.

82.75% of the females had bleeding time greater than 5 minutes and 68.96% of the females had clotting time >4 minutes. The student “t” test for bleeding time among male and female individuals showed a statistically significant value of p=0.001 and for the clotting time the P value was p=0.002, which was also statistically significant.

<table>
<thead>
<tr>
<th>Gender</th>
<th>&lt;5 min.</th>
<th>&gt;5 min.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female 58</td>
<td>10 (17.24%)</td>
<td>48 (82.75%)</td>
</tr>
<tr>
<td>Male 42</td>
<td>35 (83.4%)</td>
<td>7 (16.67%)</td>
</tr>
</tbody>
</table>

Table 1. Graph Showing Bleeding Time Below and Above 5 min. on Various Blood Groups

<table>
<thead>
<tr>
<th>Gender</th>
<th>&lt;4 min.</th>
<th>&gt;4 min.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female 58</td>
<td>18 (31.03%)</td>
<td>40 (68.96%)</td>
</tr>
<tr>
<td>Male 42</td>
<td>36 (85.71%)</td>
<td>6 (14.28%)</td>
</tr>
</tbody>
</table>

Table 2. Gender Difference in Clotting Time

<table>
<thead>
<tr>
<th>Blood group</th>
<th>&lt;5 min.</th>
<th>&gt;5 min.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O (66)</td>
<td>16 (24.24%)</td>
<td>50 (76%)</td>
</tr>
<tr>
<td>A (25)</td>
<td>17 (68%)</td>
<td>8 (32%)</td>
</tr>
<tr>
<td>B (30)</td>
<td>22 (72%)</td>
<td>8 (28%)</td>
</tr>
<tr>
<td>AB (29)</td>
<td>24 (83%)</td>
<td>5 (17%)</td>
</tr>
</tbody>
</table>

Table 3. Distribution of Bleeding Time in Different Blood Groups
DISCUSSION
Plenty of publications in medical-scientific literature deal with gender-based differences in the bleeding time and clotting time and their relationship with the blood groups.

In a study done by Dr. Sasekala et al., Dr. P. Saikumar titled Relationship Between Bleeding Time And Clotting Time And Gender Difference And Varying Blood Groups In UG Medical Students, clotting time was prolonged in group B persons than the blood group O which was statistically significant (p<0.02) whereas bleeding time was significantly more in AB group persons than in persons with blood group O and there was no significant difference in clotting time and bleeding time in both the sexes.

Another publication titled Blood Group Distribution and Its Relationship with Bleeding Time and Clotting Time: A Medical School Based Observational Study among Nepali, Indian and Sri Lankan Students by Nadera Yasmeen, Imtiaz A Liand Clotting Time: A by Nadera Yasmeen, Imtiaz A Liand Rashid Shaik published in Biomedical and Pharmacology Journal, it is found that O blood group is more prevalent in both the sexes (25% in males and 14.5% in females) than A, B and AB. Clotting time is found to be more in O Blood group in females, whereas bleeding time in different blood groups did not show any change in both the sexes.


REFERENCES

<table>
<thead>
<tr>
<th>Blood Group</th>
<th>&lt;4 Min.</th>
<th>&gt;4 Min.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O (66)</td>
<td>(15) 22%</td>
<td>(51) 78%</td>
</tr>
<tr>
<td>A (25)</td>
<td>(18) 70%</td>
<td>(7) 30%</td>
</tr>
<tr>
<td>B (30)</td>
<td>(23) 74%</td>
<td>(7) 26%</td>
</tr>
<tr>
<td>AB (29)</td>
<td>(25) 84%</td>
<td>(4) 16%</td>
</tr>
</tbody>
</table>

Table 4. Distribution of Clotting Time Indifferent Blood Groups


