LETTER TO EDITOR

DO BLOOD GROUPS INFLUENCE OUR PAIN PERCEPTION?

(Received on June 16, 2011)

Sir,

Pain represents the major motivating factor for which individuals seek healthcare, and pain responses are characterized by substantial inter-individual differences. Increasing evidence suggests that genetic factors contribute significantly to individual differences in responses to both clinical and experimental pain. Nonetheless, it is important to remember that inter-individual variability in the experience of pain is mediated by interactions among numerous biopsychosocial factors, including, but certainly not limited to genetic influences. Specifically, dispositional characteristics such as gender, race/ethnicity, personality, and age have been associated with pain responses, as have situational variables, such as mood states, stress, and transient biologic factors (1, 2, 3).

Studies on twins have demonstrated that genetic influences have an important aetiological contribution towards clinical pain states (4). It is also known that the A, B, O and AB blood groups may be differentially associated with various diseases. One of the most significant disease associations described for non-O (subjects of group A, B, or AB) versus O subjects is susceptibility to arterial and venous thromboembolism (5). Evidence supporting the view that blood group O provides a selective advantage against severe malaria has been recently reviewed (6). One of the first proven associations of a blood group polymorphism with disease was that between group O and peptic ulceration (7). Other authors have confirmed the association between blood group A and gastric cancer. In addition, they have given further support to the notion that individuals with blood group O have a higher risk of peptic ulcers than those with other blood groups (8).

We have not come across any study documenting the relation, if any, between blood groups and pain perception. This study was designed to see whether the perception of pain, induced by the cold pressor test, varies with the blood group of the subjects. The study was conducted, as part of an ongoing study on pain perception, in the Department of Physiology, University College of Medical Sciences and GTB Hospital, Delhi. The ethical committee of the institution cleared the project. The subjects were informed about the project both in written and in person and written consent was obtained from all subjects. The study was conducted on male students of 1st semester MBBS to avoid gender and age bias among other variables. The blood group of these students was analysed by the slide agglutination test during the undergraduate haematology practical on blood groups. For determining the pain perception of the subjects, the subjects were first familiarized with the laboratory and briefed about the test. A cold pressor test was used as the stimulus source to elicit pain. The subjects
were asked to immerse their dominant hand up to the wrist in cold water of 4-6 degree centigrade. Pain threshold was determined as the duration of time between when the subjects first reported pain on exposure to the painful stimulus. Pain tolerance was determined as the duration of time until the subjects withdrew their hands from the test water because the pain was unbearable.

Statistical analysis of relation of blood groups (both ABO and Rh were compared) to the pain threshold and pain tolerance was calculated using the SPSS-13 for windows using oneway ANOVA followed by Tukey test at 5% level of significance. 125 students were included in the study, out of these only 2 students were found to have the blood group AB –ve and therefore due to this low number this group was not included when statistical analysis was done. The results of pain threshold and pain tolerance values were as shown in Table I. On applying the statistical measure, which was ANOVA followed by Tukey test, no significance was found in either pain threshold or pain tolerance among the A, B, AB or O blood group and between Rh positives and negatives of any of the groups.

From our study we observed that even though the incidence of a number of diseases differs in different blood groups the physiological parameter of pain perception does not show any significant variation. This is a pilot study done on a small group and hence the results might be more conclusive on a larger sample.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the undergraduate students of first semester, UCMS, for participating voluntarily in the study.

### Table I: Pain threshold and pain tolerance of different blood groups.

<table>
<thead>
<tr>
<th>Blood group</th>
<th>n</th>
<th>Pain Th (sec)</th>
<th>Pain To (sec)</th>
<th>Blood group</th>
<th>n</th>
<th>Pain Th (sec)</th>
<th>Pain To (sec)</th>
<th>Sig. between Rh factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>A +ve</td>
<td>17</td>
<td>18.06±8.32</td>
<td>55.12±26.16</td>
<td>A –ve</td>
<td>10</td>
<td>19.30±7.9</td>
<td>60.10±21.20</td>
<td>NS</td>
</tr>
<tr>
<td>B +ve</td>
<td>42</td>
<td>15.71±8.78</td>
<td>50±22.85</td>
<td>B –ve</td>
<td>13</td>
<td>11.85±3.83</td>
<td>42.54±16.91</td>
<td>NS</td>
</tr>
<tr>
<td>O +ve</td>
<td>19</td>
<td>12.63±7.17</td>
<td>50±23.90</td>
<td>O –ve</td>
<td>13</td>
<td>13.3±8.71</td>
<td>48.08±25.84</td>
<td>NS</td>
</tr>
<tr>
<td>AB +ve</td>
<td>9</td>
<td>12±4</td>
<td>38.88±17.16</td>
<td>AB –ve</td>
<td>2</td>
<td>Not included</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sig. between ABO groups NS

(n=number of subjects, Pain Th = pain threshold, Pain To = pain tolerance, Sig. = significance, NS = non-significance)

NILIMA SHANKAR*, SHIKHA GAUTAM, ROLINDA RAJKUMARI AND GAURAV GOEL

Department of Physiology, University College of Medical Sciences, Dilshad Garden, Delhi – 110 095
REFERENCES


*Corresponding Author: Department of Physiology, University College of Medical Sciences, Dilshad Garden, Delhi – 110 095