Different Origin of nt 1246 Glucose-6-Phosphate Dehydrogenase Mutation

To the Editor:

In a recent issue of Blood, Hirono et al. reported a molecular study of 8 Japanese cases of glucose-6-phosphate dehydrogenase (G6PD) deficiency. Among these cases, they found 2 subjects carrying a G → A mutation at nt 1246 (exon 10) that has already been described as being responsible for the G6PD Tokyo variant in a single Japanese subject with hereditary nonspherocytic hemolytic anemia. They hypothesise that all the individuals bearing this mutation are descendants of the same individual, because they mention that the G6PD Tokyo mutation has been found repeatedly only in Japanese patients.

We recently described the same G → A mutation at nucleotide position 1246 in a subject of Italian ancestry (as documented for at least three generations) originating from Southern Italy. Nucleotide sequencing also found a silent C → T mutation at nt 1311 responsible for a polymorphic site common in Caucasian populations and rare in Orientals. These observations lead to the conclusion that the 1246 G → A mutation in the G6PD gene is present in different populations and it has arisen independently in Japan and in Italy. Our subject also had a chronic nonspherocytic hemolytic anemia; however, it is noteworthy that the enzymologic properties of the Italian and Japanese G6PD Tokyo are slightly different, mainly for substrate analogues use (Table 1). It will be of interest to know whether the enzymes of Japanese subjects have the same kinetic properties.

Because of the progresses in the molecular techniques applied to the study of G6PD gene, we can speculate that, in the near future, several other molecular abnormalities will be identified that are associated to different biochemical variants already named; on the other hand, although rare, we can deal with new, unnamed G6PD-deficient enzymes with different biochemical properties having a mutation already attributed to a named variant, as is the case for our G6PD variant.

In view of this and other observations, we raise the question of whether it is worthwhile to continue to define G6PD variants by names related to the origin of the subjects investigated or to define them simply by the nt site of the molecular defect.

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REFERENCES


5. Vulliamy T, Beutler E, Luzzatto L: Variants of glucose-6-phosphate dehydrogenase are due to missense mutations spread throughout the coding region of the gene. Hum Mutat 2:159, 1993

Table 1. Biochemical Data

<table>
<thead>
<tr>
<th>Analogenes (%) of use</th>
<th>Activity (% of N)</th>
<th>Mobility (% of N)*</th>
<th>K2G6P (µmol/L)</th>
<th>KGalP (µmol/L)</th>
<th>2dG6P</th>
<th>GalP</th>
<th>NADP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italian patient</td>
<td>3.3</td>
<td>93</td>
<td>52</td>
<td>4.2</td>
<td>14</td>
<td>16</td>
<td>47</td>
</tr>
<tr>
<td>G6PD Tokyo</td>
<td>4.4</td>
<td>90</td>
<td>65</td>
<td>5.5</td>
<td>&lt; 4</td>
<td>—</td>
<td>55</td>
</tr>
<tr>
<td>Normal values</td>
<td>100</td>
<td>100</td>
<td>50-70</td>
<td>2.9-4.4</td>
<td>5.6</td>
<td>8.4</td>
<td>54</td>
</tr>
</tbody>
</table>

Mean data of three determinations are shown.

* Mobility in Tris-borate-EDTA (EBT) buffer.
Predicting complete cytogenetic response in chronic myelogenous leukemia patients treated with recombinant interferon alpha [letter; comment]

FX Mahon, M Montastruc, C Faberes and J Reiffers