This study was designed to examine the stability of basic eye measurements determined by non-mydriatic retinography and their use for personal identification.

**RESULTS**

Means and standard deviations were calculated for the measurements made in each individual (abscissae and ordinates of the macula, papilla centre and first bifurcation of the superior temporal vein, STV) using the set of valid data illustrated in part in Table 1. The criterion used to identify each individual was the matching of all six variables. For each variable, the Thomson test was used to identify or reject a match.

Using this method an error is produced if any of the 6 variables in an individual do not match the individual’s own pattern. The results obtained for several significance levels are provided below:

<table>
<thead>
<tr>
<th>Alpha</th>
<th>Probability of error</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01</td>
<td>0.0006</td>
</tr>
<tr>
<td>0.02</td>
<td>0.0030</td>
</tr>
<tr>
<td>0.05</td>
<td>0.0086</td>
</tr>
</tbody>
</table>

These results indicate a lower probability of error when the data considered correspond to structures such as vessel bifurcations rather than less easily-defined structures such as the papilla and macula.

To further constrain the estimation of this probability of error, we can assume that the different variables in the individuals behave as independent variables and then by estimating the probability of an interindividual match for each one (probability of error) the probability of the whole set of variables matching can be calculated (interindividual probability of error).

The results obtained for this assumption are shown in Table 4.

**CONCLUSIONS**

The reproducibility of non-mydriatic retinal image measurements was high for the selected points. However, the abscissae and ordinates of the maculae showed practically no discriminatory capacity and produced an increase in the probability of intra-individual error. These two variables have thus been eliminated from subsequent study.

Our findings point to the blood vessels of the retina as key structures on which to base the development of new identification security devices.

**ACKNOWLEDGEMENTS**

This study was supported by a formal agreement between the Complutense University of Madrid and Alta Eficacia Tecnología SL.

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