CARACTERIZACIÓN DE ARTRITIS RHUMATÓIDE (RA) PATIENTES A TRAVÉS DE SPECTROSCOPÍA RESONANCIA NUCLEAR 1H (1H NMR).

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INTRODUCTION

RA is an autoimmune and chronic inflammatory disease associated with a high index of morbidity and mortality by cardiovascular disease (CVD). 1H-NMR is a technique capable of determining the lipoprotein and glycoprotein profiles, to characterize dyslipidemias and to estimate the cardiovascular and inflammatory risk.

Recent studies have established the importance of glycosylated proteins in important biological processes:
- Cell adhesion
- Transport
- Signal Transduction
- Control of cellular inflammation
There is a technical difficulty in quantifying the glycoproteins concentration in blood plasma for lack of a fast, sensitive and high-performance technology. However, the nuclear magnetic resonance spectroscopy can detect levels of circulating glycoproteins in a quick and accurate way.

The objective of this study is to characterize the plasmatic lipoprotein and glycoprotein profiles of RA patients using 1H-NMR in order to identify patterns of the disease's severity.

MATERIAL AND METHODS

Blood serum of 209 RA patients

Clinical data: Traditional inflammatory markers; C-reactive protein (CRP), fibrinogen, glycosylated haemoglobin (HbA1c), erythrocyte sedimentation rate (ESR), index of disease activity (DAS28), etc.

Table 1: Correlation coefficient of significant values (p<0.05) between lipid variables and HbA1c and DAS28.

<table>
<thead>
<tr>
<th>IDL-C</th>
<th>VLDL-TG</th>
<th>LDL-TG</th>
<th>HDL-TG</th>
<th>Total VLDL-P</th>
<th>Large VLDL-P</th>
<th>Med VLDL-P</th>
<th>Small VLDL-P</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c</td>
<td>0.16</td>
<td>0.17</td>
<td>0.18</td>
<td>-27.20</td>
<td>-0.14</td>
<td>0.15</td>
<td>0.14</td>
</tr>
<tr>
<td>DAS28</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-20.21</td>
<td>-0.21</td>
<td>-0.21</td>
<td>-0.21</td>
</tr>
</tbody>
</table>

Table 2: Correlation coefficient of significant values (p<0.05) between glycoproteins and traditional inflammatory markers.

<table>
<thead>
<tr>
<th>GlycA-area</th>
<th>CRP</th>
<th>Fibrinogen</th>
</tr>
</thead>
<tbody>
<tr>
<td>GlycA-area</td>
<td>0.23</td>
<td>0.17</td>
</tr>
<tr>
<td>GlycA-height</td>
<td>0.27</td>
<td>0.23</td>
</tr>
<tr>
<td>GlycB-area</td>
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<td>0.14</td>
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<tr>
<td>GlycB-height</td>
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</tr>
<tr>
<td>GlycB-width</td>
<td>-0.22</td>
<td>-0.20</td>
</tr>
<tr>
<td>GlycB-height</td>
<td>-0.22</td>
<td>-0.20</td>
</tr>
</tbody>
</table>

RESULTS

Univariate statistical analysis: Association between the inflammatory markers and the 1H NMR lipoprotein and glycoprotein profiles

Multivariate statistical analysis: Contribution of 1H NMR parameters on the index of disease activity (DAS28) categorized by quartiles

Figure 1: ROC (Receiver Operator Characteristics) curve predicting the behaviour of the model containing the glycoprotein and lipoprotein variables along with the RA traditional parameters of inflammation (CRP, ESR and fibrinogen).

The area under the curve (AUC) of the estimated curve (blue) is 0.8072 and the AUC of the Cross-validated curve (green) is 0.7641.

Figure 2: ROC curve containing only the RA traditional parameters of inflammation (CRP, ESR and fibrinogen).

The area under the curve (AUC) of the estimated curve (blue) is 0.7594 and the AUC of the Cross-validated curve (green) is 0.7506.

CONCLUSIONS

1H-RMN metabolomics is a useful tool to identify atherogenic and inflammatory profiles in patients with RA. These profiles, along with the classic AR inflammatory profiles, provide more accurate information about the severity and activity of the disease.

ACKNOWLEDGEMENT

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REFERENCES