Immunofluorescent staining of rat gastric parietal cells by human antibody unrelated to pernicious anaemia

H. K. MULLER, A. R. McGIVEN, AND R. C. NAIRN

From the Department of Pathology, Monash University, Melbourne, Australia

SYNOPSIS Immunofluorescence tests on 94 human sera reacting with rat gastric parietal cells revealed that 41 (44%) of the sera contained antibody to a rat parietal cell antigen that was distinct from the pernicious anaemia autoantigen. Ten of the sera contained antibodies to both parietal cell antigens. The remaining 53 (56%) sera contained only parietal cell antibodies of the pernicious anaemia type. We recommend that mouse gastric mucosa, which does not react with the heterologous rat parietal cell antibody, replace rat gastric mucosa for immunofluorescence diagnostic tests.

It was previously reported from this laboratory that rat stomach provided a satisfactory substrate for immunofluorescence testing of gastric parietal cell antibodies in pernicious anaemia (de Boer, Nairn, and Maxwell, 1965). Recently it was found that approximately 12% of sera from normal individuals and patients without pernicious anaemia contained an antibody which reacted with a distinct antigen of rat gastric parietal cells and renal tubule brush border and not with human tissue (Ireton, Muller, and McGiven, 1971). This communication is a warning of this source of confusion to laboratories using rat stomach for immunofluorescence tests, and to recommend the use of mouse gastric mucosa instead which does not react with the heterologous parietal cell antibody.

Methods

Ninety-four human sera, known to react at a dilution of 1 in 5 with rat gastric parietal cells, were retested by 'sandwich' immunofluorescence on frozen sections of human gastric fundus mucosa and of the proximal part of the glandular zone of rat and mouse stomach wall (Nairn, 1969). Sections of rat kidney were used to detect mitochondrial antibodies and the cross-reacting parietal cell and brush border antibody. Two sera containing mitochondrial antibodies, which also react with parietal cells, were excluded from this study.

Results

The results are given in the Table. Group I sera contain the conventional parietal cell antibody of pernicious anaemia. Group III sera contain the heterologous parietal cell antibody and group II sera contain both parietal cell antibodies.

<table>
<thead>
<tr>
<th>Immunofluorescent Staining</th>
<th>Gastric Parietal Cells</th>
<th>Rat Renal Tubule Brush Border</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Human</td>
<td>Mouse</td>
<td>Rat</td>
</tr>
<tr>
<td>Group I</td>
<td>53</td>
<td>53</td>
<td>53</td>
</tr>
<tr>
<td>Group II</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Group III</td>
<td>0</td>
<td>0</td>
<td>31</td>
</tr>
<tr>
<td>Totals</td>
<td>63</td>
<td>63</td>
<td>94</td>
</tr>
</tbody>
</table>

Table Incidence of gastric parietal cell and renal brush border antibodies

Although all sera reacted with rat gastric parietal cells, only 63 (67%) comprising groups I and II reacted with human and mouse stomach. The remaining 31 sera (33%) of group III contained the heterologous rat parietal cell and brush border antibody and did not react with human or mouse stomach. Ten sera (11%) forming group II contained both parietal cell antibodies and consequently stained human, mouse, and rat parietal cells and rat renal tubule brush border.
Discussion

Our results indicate that one third of human sera reacting with rat gastric parietal cells contain a heterologous antibody and not the conventional parietal cell antibody associated with pernicious anaemia. The fluorescent staining patterns of the two antibodies on rat tissue have been indistinguishable, hence it is apparent that a misleading positive result might be reported on a significant proportion of sera. The concurrent use of rat kidney sections, already used widely for the detection of mitochondrial antibodies, will detect those sera containing the heterologous antibody by virtue of the associated brush border staining.

In our experience the heterologous parietal cell antibody is unrelated to pernicious anaemia, although in the present study it was found in 16% of the sera containing the conventional parietal cell antibody. Such sera were distinguished by their ability to stain both rat and mouse or human stomach mucosa and rat renal tubule brush border.

Mouse gastric mucosa, in our tests, gave a more intense and regular staining pattern than human stomach. The correlation between the staining of mouse and human gastric mucosa, neither of which react with the heterologous parietal cell antibody, indicates that mouse stomach is a satisfactory substitute for human gastric mucosa and should replace the previously recommended rat stomach as a diagnostic substrate.

We wish to thank Miss H. McLeod for technical assistance.

This work was supported by a grant from the National Health and Medical Research Council.

References

