Percutaneous local therapies for hepatocellular carcinoma impair gastric function

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We recorded EGG before and 3 d after therapy, and the results were compared. EGG was recorded with a portable electrogastrographic recorder (NIPRO; Tokyo, Japan). Five electrodes were affixed to the abdomen as shown in Figure 1, and EGG was recorded for 30 min during a fasting period and again during a postprandial period. We evaluated the percentages of bradygastria (<2.4 c/min), normogastria (2.4 - 3.6 c/min), and tachygastria (>3.6 c/min), as well as the dominant frequency (DF) and the postprandial-to-fasting power ratio (PR). We also examined clinical abdominal symptoms, using the questionnaire reported by Svedlund et al. (Gastrointestinal Symptom Rating Scale, GSRS[8]) which was translated into Japanese. The translated form was provided by Astra Zeneca (Tokyo, Japan). Measured values were expressed as mean ± SE. Comparisons before and after therapy were performed by the paired Student’s t-test, and P < 0.05 was accepted as a significant difference.

The results are summarized in Table 1. Because the similar EGG patterns were obtained from all the channels, the data of channel 1 are shown in Table 1. After percutaneous local therapies for HCC, the percentages of bradygastria in the fasting period were significantly increased, while the percentages of normogastria in the same period were significantly decreased. The PR of normogastria and bradygastria was significantly decreased after therapy. Conversely, no significant differences were found in the calculated GSRS scores obtained from the questionnaire before and after therapy. This study is the first report to estimate the effect of percutaneous local therapies for HCC on the gastric myenteric activity. The present results indicate that percutaneous therapies for HCC may impair gastric function even when clinical symptoms are not apparent.

The first EGG measurement in humans was performed by Alvarez[9]. This method can be used to noninvasively assess the electrical activity generated by gastric smooth
Table 1 Comparisons between before and after therapy (mean±SE)

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bradygastría (%)</td>
<td>54.0±7.4</td>
<td>77.4±5.6*</td>
</tr>
<tr>
<td>Normogastria (%)</td>
<td>42.4±7.5</td>
<td>18.6±5.2*</td>
</tr>
<tr>
<td>Tachygastria (%)</td>
<td>3.2±1.8</td>
<td>4.0±4.0</td>
</tr>
<tr>
<td>PR of bradygastría (%)</td>
<td>1.3±0.1</td>
<td>0.8±0.1*</td>
</tr>
<tr>
<td>PR of normogastria (%)</td>
<td>2.5±0.5</td>
<td>1.8±0.5*</td>
</tr>
<tr>
<td>PR of tachygastria (%)</td>
<td>2.1±0.5</td>
<td>1.7±0.5</td>
</tr>
<tr>
<td>DF (c/min)</td>
<td>2.3±0.1</td>
<td>1.9±0.1</td>
</tr>
<tr>
<td>Gastrointestinal symptoms</td>
<td>1.8±0.2</td>
<td>2.2±0.5</td>
</tr>
</tbody>
</table>

*p < 0.05 vs before therapy

Figure 1 The positions of electrodes for EGG recording. X, xyphoid process; N, navel; RMCL, right mid-clavicular line; LMCL, left mid-clavicular line; C, central terminal electrode placed on the patient's ventral midline about halfway between the umbilicus and the xyphoid process; A, channel 1 placed on an intersecting point between RMCL and a vertical bisectrix of the line XC; B, channel 2 placed on intersecting point between LMCL and a vertical bisectrix of the line XC; D, channel 3 placed on intersecting point between RMCL and a vertical bisectrix of the line NC; E, channel 4 placed on intersecting point between LMCL and a vertical bisectrix of the line NC.

EGG has been shown to provide useful information for clinical diagnoses. EGG abnormalities have been observed in disorders of gastric emptying, nausea and vomiting.

Percutaneous local therapies is of great significance in the treatment of HCC and metastatic liver tumors. PELI, PEI-RFA and PELI-RFA are new therapeutic methods for HCC, which we have developed. We have confirmed the usefulness of these novel percutaneous local therapies in the treatment of HCC. It has been shown that transcatheter arterial chemoembolization affected the gastric myenteric activity and that overproduction of endogenous prostaglandin was related to dysrhythmia of the gastric myenteric activity. In this pilot study, we demonstrated that the gastric myenteric activity was affected by percutaneous local therapies for HCC, although abdominal symptoms were not apparent and GSRS scores obtained from the questionnaire did not change significantly after therapy. It is a significant clinical matter that delayed gastric transit may occur after percutaneous therapy for HCC. Because it has been reported that patients with HCC tend to have gastrointestinal dysfunction, we have to pay attention to gastric dysfunction after percutaneous local therapies for HCC even when there are no clinical symptoms. The mechanisms underlying the effect of percutaneous local therapies for HCC on extrahepatic abdominal organs need further exploration.

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