Staging Gastritis Based on Endoscopic Atrophic Border Backed by Operative Link for Gastritis Assessment System in 158 Health Checkup Subjects: Single Center Study

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Background/Aims: Newer operative link for gastritis assessment (OLGA) system tried to stage gastritis in view of gastric cancer (GC) risk and endoscopic atrophic border (EAB) was well correlated with OLGA. We described the gastritis on the base of EAB during endoscopic sessions and classified them into high or low stage gastritis as suggested by Quach et al. and analyzed them.

Materials and Methods: A total of 158 subjects who visit our health promotion center were graded on the base of EAB by conventional endoscopy and reallocated according to ages. Linear-by-linear association was performed to identify the differences of gastritis among age-groups.

Results: In our study 31% of patients had atrophic gastritis (AG) over AG closed type 3 ~ open type 1 compatible with OLGA stages III/IV (high stage gastritis). High and low stage gastritis showed significantly different distribution at each age group. The proportion of endoscopically diagnosed high stage gastritis increased in proportion to age. Contrast to Quach et al. our study showed prevalence of high stage gastritis under 40s, even in 20s or 30s (P=0.002).

Conclusions: OLGA based EAB is easy and useful in GC risk stratification. In our study unlike the previous study of Quach et al., high stage gastritis was found in younger age groups. We should and could make an effort to prevent GC in even younger age groups with the aid of EAB. Additionally we could get organized and communicable stratified data about GC risk.

Key Words: Gastritis; Atrophy

INTRODUCTION

A Recently published management of precancerous conditions and lesions in the stomach (MAPS) suggest 3-year surveillance of the precancerous conditions (extensive atrophic gastritis and intestinal metaplasia, AG/IM) but there was additional comment about managing people who have no designated risk factors. The verdict was that individualized follow-up should be considered, newer operative link for gastritis assessment system (OLGA) tried to stage gastritis on the base of gastric cancer (GC) risk. Quach et al. showed that endoscopic atrophic border (EAB) suggested by Kimura and Takemoto could be well correlated with OLGA staging, so very useful and applicable method in situation where the burden of endoscopy is too heavy to obtain histologic samples to assess the severity of gastritis. Therefore, we evaluated the distribution and severity of gastritis of subjects who are in health checkup period based on EAB.

MATERIALS AND METHODS

1. Subjects and endoscopic examinations

A total of 158 subjects who visit our health-promotion center for screening endoscopy from June 2012 to December 2012 were consecutively enrolled in this study. They were under conventional white light endoscopy using a GIF-Q260 (Olympus Co., Tokyo, Japan) and categorized into superficial gastritis (SG) for invisible EAB with regular arrangement of collecting venules on body area and normally looking antrum, and AG closed type 1 ~ open type 3 (C-1 ~ O-3) based on the method suggested by Kimura and Takemoto. All endoscopic procedures were performed by main author to minimize inter-observer variability.
2. Staging gastritis and determination of Helicobacter pylori status

The severity of gastritis was evaluated and, AG C-1 ∼ C-3 were classified into mild to moderate (low stage gastritis), and discretionally, acute gastric mucosal lesion (AGML), SG, mild lymphofollicular gastritis (LFG), LFG, chronic superficial gastritis (CSG) (impossible to delineate EAB but mucosa have evidence of inflammation such as hyperemia, erythema and exudate) were also put into low stage gastritis and AG C-3 ∼ O-3 were into moderate to severe gastritis (high stage gastritis) as suggested by Quach et al.4 Helicobacter pylori status was examined with the rapid urea test using CLO Helicobacter-detection kits (Asan Pharm Co., Ltd., Seoul, Korea) and samples for test were collected from greater curvature of gastric midbody.

3. Statistical analysis

All statistical analyses were performed with PASW Statistics 18.0 (IBM Co., Armonk, NY, USA). Linear-by-linear association was done to achieve $P$ value, $P<0.05$ was regarded as statistically significant. Their distribution and prevalence were analyzed.

### RESULTS

1. Demographic features and characteristics of subjects

A total of 158 subjects were included in the study. The mean age was 42.7 years with a range from 23 to 69 years. Male to female ratio was 1.68:1. H. pylori positivity was demonstrated in 74 subjects (46.8%), all accompanying endoscopic diseases were benign (Table 1). Number of each endoscopic finding was shown in Fig. 1.

2. Distribution of gastritis

Each endoscopic finding with each age group was shown in Fig. 2. AGML, CSG, mild LFG, LFG, SG were all categorized into low stage gastritis along with AG C-1 ∼ C-3 low stage gastritis was more frequent in 30s and 40s group, high stage gastritis was more in 40s and 50s group (Fig. 3).

3. Prevalence of gastritis

When analyzed according to age, high and low stage gastritis showed significantly different distribution at each age group ($P<0.002$), the proportion of endoscopically diagnosed high stage gastritis increased in proportion to age (Fig. 3). The overall prevalence rates of endoscopically di-

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**Table 1.** Demographic Features and Characteristics of the Subjects

<table>
<thead>
<tr>
<th>Variable category</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>99 (62.7)</td>
</tr>
<tr>
<td>Female</td>
<td>59 (37.3)</td>
</tr>
<tr>
<td><strong>Age (yr)</strong></td>
<td></td>
</tr>
<tr>
<td>20s</td>
<td>10 (6.3)</td>
</tr>
<tr>
<td>30s</td>
<td>47 (29.7)</td>
</tr>
<tr>
<td>40s</td>
<td>64 (40.5)</td>
</tr>
<tr>
<td>50s</td>
<td>28 (17.7)</td>
</tr>
<tr>
<td>60s</td>
<td>9 (5.7)</td>
</tr>
<tr>
<td><strong>Endoscopic disease</strong></td>
<td></td>
</tr>
<tr>
<td>Gastric ulcer</td>
<td>5 (3.2)</td>
</tr>
<tr>
<td>Duodenal ulcer</td>
<td>12 (7.6)</td>
</tr>
<tr>
<td>Subepithelial lesion</td>
<td>5 (3.2)</td>
</tr>
<tr>
<td>Reflux esophagitis</td>
<td>13 (8.2)</td>
</tr>
<tr>
<td><strong>Helicobacter status</strong></td>
<td></td>
</tr>
<tr>
<td>Total CLO</td>
<td>92 (58.2)</td>
</tr>
<tr>
<td>Positive CLO</td>
<td>74 (46.8)</td>
</tr>
</tbody>
</table>

CLO, the rapid urease test.
agnosed low and high stage gastritis cases were 69% (109/158) and 31% (49/158), respectively. Even in 20s or 30s, small but some portion of high stage gastritis was found, high to low ratios of them were 0.11, 0.24, respectively (Table 2).

**DISCUSSION**

In Korea, stomach cancer is one of the most common cancers. Thus, endoscopists have been determined to improve the detection of early gastric cancer (EGC), and Korea is an outstanding country screening GC with endoscopy. However, there has been a lack of knowledge concerning the estimation of GC risk, so quantification of cancer risk by endoscopy has never been attempted. In small- or medium-sized hospitals with health-promotion centers, the detection of EGC is prioritized, and that is almost all that can be done. There have been numerous papers on the causes of GC (e.g., *H. pylori*, nitrous compounds, salt, etc.), and doctors need to direct patients on how to eat and maintain a healthy lifestyle to prevent GC. However, for endoscopists, guiding patients on the basis of endoscopic findings could be more logical, and there is a need for a scale that would enable physicians to manage gastritis (e.g., whether *H. pylori* should eradicated, how often should be followed), whereas in Korea biennial endoscopy is recommended for all patients over the age of 40. Therefore it is high time gastritis staging and a more individualized approach is introduced.

A recently published MAPS suggested a unique guideline: People who have extensive AG/IM should be followed at three-year intervals. However, there were studies that showed that a relatively large number of patients had advanced GC, even though they had been followed at one- or two-year intervals. Furthermore, MAPS was...
based on histologic confirmation which is hardly applicable in current screening endoscopic session.

The OLGA system is a very useful tool for grading the severity of gastritis and assessing GC risk, though it requires biopsies to be taken. OLGA stage III/IV suggests a high risk of GC, and more vigilant surveillance is required than for other stages, so the single follow-up policy might no longer apply to these high risk stages. At the same time, education on lifestyle modification should be provided to patients. Even though the OLGA staging system is useful, from a practical point of view, especially considering the mass endoscopic screening required in Korea, the application of the OLGA system is impossible, because obtaining histologic samples for staging gastritis is difficult and time consuming.

We need practical alternatives, and Quach et al. showed that the EAB was significantly correlated with the OLGA system. In addition, extensive IM with incomplete subtype was significantly correlated with moderate to severe endoscopic gastric atrophy. Wong et al. revealed that before advanced gastritis develops, management (e.g., H. pylori eradication) is very important in preventing GC. Moreover, recently published H. pylori eradication guidelines recommended that H. pylori eradication in AG be considered as an important strategy for GC prevention.

In the context of this paradigm shift, it is crucial for endoscopist to differentiate low stage from high stage gastritis by endoscopy and to keep in mind the concept of EAB. We applied EAB to all health check-up subjects and retrieved above results. Instead of merely suggesting regular follow-ups to patients with no evidence of EGC, we could provide our patients with detailed and specific advice. For example, we could recommend with confidence shorter follow-up intervals to patients who have AG C-3~O-1. In addition, we could consider H. pylori eradication in AG C-1~C-3 patients with a family history of GC or young AG C-1~C-3 patients. This suggested method not only could give us insight into gastritis staging, which used to be neglected in mass-screening practice, but it is also simple and easily taught. Therefore, we could identify the severity of gastritis at a glance without sophisticated equipment and apply it with ease.

Unlike Quach et al., our study showed that high stage gastritis existed even in their twenties and thirties, and this can be explained by the higher GC prevalence in Korea compared to that in Vietnam where GC prevalence is moderate. Thus, early carcinogenesis and genetic aspects seen in Japan might be related.

Regarding the limitations of our study, the geographic aspect should be considered, as Ulsan is Korea’s youngest and most industrialized city, so few aged people were included and more people with a relatively high social class were included. Therefore, our results may not be applicable to all areas in Korea. However, it is not difficult to put the EAB principle to practical use, and in the near future, all Korean data will be able to be collected.

We should not rely solely on this tool, as OLGA itself has no significance of body gastritis that can contribute to GC with poorer histologic type without high stage of OLGA system, and Thus, conducting a thorough exam of the gastric mucosa is very important. Further universally applicable systems need to be established in the future. We will not stick to this method; however, until another histologically correlated endoscopic modality emerges, EAB backed by OLGA could be a good way to classify and manage gastritis, and it could help to improve communication among endoscopists.

REFERENCES

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