Helicobacter pylori and gastric malignancies

M. Melange, L. Oosterbosch

Department of Gastroenterology, University Hospital of Mont-Godinne, 5530 Yvoir.

Key words: Helicobacter pylori, intestinal metaplasia, gastric malignancies, gastric lymphoma, low grade malt lymphoma.

H. pylori infection is associated with adenocarcinoma of the body and antrum of the stomach and with gastric maltoma.

1. H. pylori infection associated with adenocarcinoma of the stomach

Epidemiologic data indicated that gastric cancer occurs more frequently in some populations that have higher rate of H. pylori infection. However, some examples exist of disparity in the epidemiology of the two diseases. Other factors that H. pylori infection contribute to the risk of gastric cancer. H. pylori causes type B chronic gastritis and continued mucosal damage may progress to chronic atrophic gastritis. In population with an increased risk of gastric cancer, we observe strong association between H. pylori and both chronic atrophic gastritis and intestinal metaplasia (1,6).

Chronic atrophic gastritis is an indicator of gastric cancer risk. Incidence, extent and severity of intestinal metaplasia are most pronounced in the area closest to the tumor. Intestinal metaplasia affects both intestinal and diffuse cancer. We observed close relationship between the prevalence of H. pylori infection and gastric cancer, and geographical variations of H. pylori gastritis and gastric carcinoma. H. pylori is thus considered as a group I carcinogen.

The geographical variations indicate inverse relationship between the ratio of mortality from DU/GU and gastric carcinoma. In the DU, the pattern of gastritis is antral and in GU, the pattern of gastritis is diffuse and more atrophic, similar in many cases of gastric carcinoma.

The induction of gastric cancer is influenced by depressed levels of gastric juice vitamin C after H. pylori infection, diminished antioxidant capacity of gastric juice and production of ammonia, liberated by urease, which accelerate the epithelial proliferation in the rat stomach. Gastric mucosal damage may be caused by acetaldehyde production.

Others factors influence the relation between Helicobacter pylori and gastric cancer (2) :

— seropositivity to CAG A ;
— low pepsinogen concentration ;
— presence of blood group A, related to the adhesion of H. pylori to blood-group substances on the surface of the gastric epithelium or secreted into saliva and gastric juice.

Consumption of fruit and vegetables exerts a protective effect against intestinal metaplasia. Infection with CAG A strains is associated with a higher risk of developing intestinal metaplasia and gastric carcinoma. Different antigenic properties and allelic variations in the CAG A protein exist in different parts of the world (4).

Endoscopic series confirm a prevalence of Helicobacter pylori in gastric cancer (3). H. pylori serology is positive in 82-95%. We don't observed any presence of H. pylori on cancerous tissue. Diffuse cancer predomines in younger patients but higher prevalence of H. pylori is observed in the intestinal type. H. pylori is rarely associated with cancer of the cardia, a location with an increasing incidence.

The Maastricht consensus report considers that eradication is strongly recommended based on the level of supportive evidence after endoscopic resection of early gastric cancer. Eradication is advisable, based on the level of equivocal evidence in cases of family history of gastric cancer (4).

2. Helicobacter pylori and gastric low grade MALT-lymphoma

Primary gastric non-Hodgkin's lymphoma (NHL) is rare and constitutes 3% of all gastric neoplasia. H. pylori is present in 95% of patients with gastric low grade MALT-lymphoma and previous infection with H. pylori increases six times the risk to develop gastric MALT-lymphoma. H. pylori associated gastritis shows frequently mucosal lymphoid follicles.

B-cells from MALT tumors proliferate in response to H. pylori-antigens when inoculated in the presence of H. pylori-specific T cells.

Diagnosis of H. pylori related gastric NHL includes morphology, presence of monoclonality, immunohistochemistry, molecular pathology (southern blot, polymerase chain reaction). Endoscopy and endosonography are necessary to detect erosion, ulceration or tumor and to evaluate the extension of the disease and the presence of adenopathy.

Eradication of H. pylori is associated with histological regression of low grade MALT-lymphoma in 60-83% of cases (8,9).

However, persistence of monoclonality in some cases suggests occult neoplastic infiltrate. Failure of therapy is mainly due to presence of high-grade lymphoma. Prevention of relapse after eradication includes proper staging, endoscopic follow-up and association of monochemotherapy. In some cases, surgery or radiotherapy are necessary.

Others lymphomas are associated with H. pylori :

— salivary gland low grade MALT-lymphoma ; immunoproliferative small intestinal disease ;
— rectal MALT-lymphoma ;
— duodenal MALT-lymphoma ;
— gastric large-cell lymphoma.

The Maastricht consensus report suggests that eradication of H. pylori is strongly recommended is case of maltoma, based on the level of unequivocal evidence but regular follow-up in specialised unit is essential (5).

References

1. CRAANEN M.E., DEKKER W., BLOK P., FERWEIJA J., TYTGAT G.N.J. Intestinal metaplasia and Helicobacter pylori : an endoscopic bioptic study of the gastric antrum. *Gut*, 1992, **33** : 16-20.
2. PARSONNET J., FRIESMAN G.D., ORENTREILH N., VOGELMAN H. Risk for gastric cancer in people with Cag A positive or Cag A negative Helicobacter pylori infection. *Gut*, 1997, **40** : 297-301.
3. DEBONGNIE J.C., BURETTE A., GLUPCZYNSKI Y., DE PREZ C., DE KONINCK Y., DONNAY M. Helicobacter pylori. An endoscopic series. *Acta Gastroenterol. Belg.*, 1997, **60** : 189-191.
4. ASAKA M., TAKEDA H., SUGIYAMA T., KATO M. What role has Helicobacter pylori in gastric cancer ? *Gastroenterology*, 1997, **113** : 556-560.
5. The European Helicobacter pylori study group. Current European concepts in management of Helicobacter pylori infection. The Maastricht consensus report. *Gut*, 1997, **41** : 8-13.
6. WEE A., KANG J.Y., TEH M. Helicobacter pylori and gastric cancer : correlation with gastritis, intestinal metaplasia and tumor histology. *Gut*, 1992, **33** : 1029-1032.
7. ECTORS N., DRIESSEN A., DEWOLF-PEETERS C., GEBOES K. Gastric lymphoma and Helicobacter pylori. Diagnostic criteria. *Acta Gastroenterol. Belg.*, 1997, **60** : 220-221.
8. STOLTE M., EIST S. Healing gastric malt lymphomas by eradicating Helicobacter pylori. *Lancet*, 1993, **342** : 568.
9. WHOTERSPOON A.C., DOGLIONI C., DISS T.C., PAN L., MOSCHINI A., DE BONI M., ISAACSON P.G. Regression of primary low grade B-cell lymphoma of the mucosa associated lymphoid tissue type after eradication of Helicobacter pylori. *Lancet*, 1993, **342** : 575-577.