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Helicobacter pylori –Protective or Causative Agent in Oesophageal Cancer?

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Helicobacter pylori (*H. pylori*) is a helical shaped gram negative bacterium. This bacteria has been associated with a large number of benign and malignant conditions of upper gastro-intestinal tract, the common condition associated with it are duodenal and gastric ulcers, non cardia gastric cancer, atrophic gastritis and low grade gastric maltomas. During the last two decades a large number of studies have concluded that *H. pylori* is the most important etiologic agent in peptic ulcer disease, Hodgkin lymphoma of the stomach and gastric adenocarcinoma.

The different strains of *H. pylori* behave differently. Those strains that possess 'pathogenicity islands' are more virulent. The 'pathogenicity island' is a group of genes which gives more virulence to the organism. Though the role of *H. pylori* in the causation of diseases of stomach and duodenum is well established, in recent years the bacteria causing diseases of the oesophagus, especially oesophageal cancer has been extensively studied. In the eastern world which includes China, Indian subcontinent, Iran etc, it was observed that there is a negative association between *H. pylori* and oesophageal adenocarcinoma[1-3]. In the western world which includes Europe & United States of America the negative association between *H. pylori* & oesophageal cancer is not marked[4,5].

When the infection is confined to the antrum it causes non-atrophic gastritis which increases the secretion of hydrochloride acid (HCl), this type of infection is associated with duodenal ulcer and is common in the western world. The other type of infection in which the patient develops atrophic gastritis in which there is minimal or no acid secretion, this type of gastritis is associated with gastric cancer and is common in the eastern world, the third type of gastritis is in between these two groups, more towards the atrophic pattern.

The first type of gastritis (antral predominant) is associated with duodenal ulcer, they have increased risk of oesophageal adeno carcinoma. The second group with atrophic gastritis is associated with non-cardia gastric cancer[6-8]. In a meta-analysis published in the World Journal of Gastroenterology[8] the authors concluded that *H. pylori* infection is a strong protective factor against oesophageal adenocarcinoma. The underlying mechanism by which *H. pylori* protects the oesophagus is yet not clear. However, two theories have been proposed. *H. pylori* related gastritis may result in lower gastric acid secretion. Hypoacidity is one of the reasons for the inverse association with oesophageal carcinoma. Further, *H. pylori* infection reduces ghrelin synthesis, which induces early satiety thereby preventing obesity and rapid gastric emptying. This reduces the risk of gastro oesophageal reflux and oesophageal carcinoma.

This meta-analysis indicated that *H. pylori* infection might play a protective role in oesophageal squamous cell carcinoma (ESCC) risk in eastern population and in oesophageal adenocarcinoma (EAE) risk in the overall population.

In a Chinese study[9] the authors did not find any association between *H. pylori* and oesophageal squamous cell carcinoma. *H. pylori* infection may cause gastric atrophy leading to atrophic gastritis which allows over growth of bacteria, Nitrosamines are produced by these bacteria leading to increase oesophageal cancer risk. Both decrease and increased risks of oesophageal squamous cell cancer associated with *H. pylori* have been reported.

In our own study conducted at J.N Medical College, Aligarh Muslim University, India,we found that there is strong a positive association with *H. pylori* infection and oesophageal cancer. Majority of our patients were having oesophageal squamous cell carcinoma (77.7%) and the rest adenocarcinoma (13.3%). Both oesophageal squamous cell carcinoma and oesophageal adenocarcinoma patients had similar seropositivity for H. pylori (89.287% and 87.5% respectively). Thus we see that Aligarh city is in India (Eastern World) but *H. pylori* infection and oesophageal cancer are directly associated.

There is world-wide increase in oesophageal cancer with a grim over all prognoses. As with most cancers oesophageal cancer is a multifactorial disease. The knowledge of the role of H. pylori in the prevention or causation of oesophageal cancer may help in planning preventive and therapeutic strategies in future.

Conclusion

H. pylori is one of the most extensively studied organism in recent times. The role of this organism in the aetiology of different diseases of the stomach and duodenum is well established, however the association of *H. pylori* in the causation of the diseases of the oesophagus especially oesophageal cancer is the subject of on-going research.Whether *H. pylori* is a protective or causative agent will be answered only after the researches including our own are concluded. Large multi centric randomised controlled trials are needed to solve this complex issue.

Conflict of Interest: The author declares no conflict of interest

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