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Helicobacter pylori Infection and Inflammation: Implications for Pathophysiology of Diabetes Mellitus and Coronary Heart Disease

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ABSTRACT Asian Indians living in the Indian subcontinent or abroad experience high rate of coronary heart disease (CHD) and type 2 diabetes mellitus (T2DM). Asian Indians are also known to suffer from various infections, particularly during their childhood. One such chronic infection is with *Helicobacter pylori (H. pylori)*. Since *H. pylori* with its specific virulence factor cytotoxin-associated gene A (cagA) has been suggested to be associated with CHD, a role of this *H. pylori* infection was investigated in the pathogenesis of CHD in Asian Indians living in Bangladesh. *H. pylori* (CagA) infected subjects with CHD (HP+ve cases, n=21), and without CHD (HP+ve controls, n=20), and non-infected without CHD (HP-ve normal controls, n=21) were included in this study. Thromboxane (TXB), an index of platelet activation, was found to be significantly higher in the HP+ve cases (p=0.05), but not in the HP+ve controls (p=0.88) when compared with HP-ve controls. Analyses of lipid profiles revealed that while triglycerides, total cholesterol and LDL did not show any significant changes, HDL was significantly lower in both the HP+ve cases (p=0.0003) and controls (p=0.005). The mean fasting glucose level in the HP+ve cases was markedly increased (p>0.0001), while it was intermediate in the HP+ve controls, and lowest in the HP-ve controls. HOMA-IR values, a measure of insulin resistance, did not reflect any substantial differences between the HP+ve and HP–ve controls, but they were highly significantly different between the HP+ve cases and HP–ve controls. HOMA-B, indicating insulin secretory dysfunction (ISD), was significantly higher in both the HP+ve groups when compared with the normal controls. The data indicate that *H. pylori* infection is associated with impaired insulin secretion, and that a component of insulin resistance that occurs independent of *H. pylori* can then lead to a worsening of glucose tolerance and the development of CHD. This is the first demonstration to our knowledge that *H. pylori* (CagA) infection is associated with insulin secretory dysfunction in human subjects. Since many Asian Indians contract various other chronic and acute infections, it is important to investigate the role of *H. pylori* and other infectious agents in the pathogenesis of T2DM and CHD.