Carbonic Anhydrase-II Phenotypes in Peptic Ulcer and Ulcerated Cancers

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ABSTRACT With 12 different isozymes, Carbonic anhydrase plays a key role in acid-base balance, CO₂ and ion transport…etc. Any change in the enzymatic activity may cause disturbances in these processes leading to different disorders. The study focuses on the association of electromorphs of Carbonic anhydrase-II (CAII) with peptic ulcers and ulcerated cancers, which result due to an imbalance between the aggressive and defensive factors necessary for maintaining the pH of the gastric lumen. Endoscopically confirmed 210 duodenal ulcer, 50 gastric ulcer and 50 gastric cancer cases were considered along with 110 healthy individuals for comparative study. Since H.pylori infection is considered as primary risk factor, Rapid Urease Test (RUT) was performed to identify the infection status in both disease and control groups. Phenotyping of CAII was carried out in both control and disease by subjecting the haemolysate to PAGE and detecting the bands based on esterase activity of CAII using α or β-napthol acetate. Frequency distribution of different phenotypes with respect to various factors was compiled and relative risk estimates were obtained using Woolf’s δ-method. The allelic frequencies of CAII calculated, were tested for Hardy-Weinberg equilibrium. Frequency distribution of CAII phenotypes showed increased number of heterozygotes (2-1) in controls, against higher number of homozygotes (2-2) in diseased group. Similarly, blood group O was predominant in disease group as against group B in controls. Most of the controls were negative for H.pylori infection and almost 100% individuals in disease group were positive. In conclusion, the allele CAII2 was found to be associated with peptic ulcers and ulcerated cancers along with blood group O and positive H.pylori infectivity status, predisposing an individual to the disease condition.