

## **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, CO<sub>2</sub> 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 CA<sub>II</sub> was carried out in both control and disease by subjecting the haemolysate to PAGE and detecting the bands based on esterase activity of CA<sub>II</sub> using  $\alpha$  or  $\beta$ -naphthol acetate. Frequency distribution of different phenotypes with respect to various factors was compiled and relative risk estimates were obtained using Woolf's  $\delta$ -method. The allelic frequencies of CA<sub>II</sub> calculated, were tested for Hardy-Weinberg equilibrium. Frequency distribution of CA<sub>II</sub> 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 CA<sub>II</sub>2 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.