

## Comparative Study of Temperature and pH Stresses on Conversion of Spiral to Coccoid Shape of *Helicobacter pylori* Using 2-dimensional Gel Electrophoresis

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**Background & Objectives:** *Helicobacter pylori* is a gram negative, microaerophilic and S shape microorganism, which has a strong urease enzyme. This bacterium is an important factor in producing chronic infections in stomach mucous, chronic gastritis, peptic wounds and stomach cancer in humans. Infection with these bacteria has a pandemic condition and often it relates to poor economic-social condition. When this bacterium is under stress condition such as oxygen pressure lack of nutrition material and condition with acidic pH, it produces coccoid shape. Metabolically this form is active and forms conserve cell wall, plasma membrane and cytoplasm for several months, which is an important factor for transferring contamination with water, nutrition and waste releases of body. Return of coccoid shape to spiral causes severe diseases and as a result doesn't let killing of bacteri.

**Methods:** In this study we isolated this bacterium from stomach biopsy of infected individuals. Then coccoid form produced under the temperature and pH stress and compared specific antigens in coccoid and spiral forms. For this end, *Helicobacter pylori* in spiral form cultivated and suspension of single clones was prepared in BHI liquid medium and effects of different stress was studied. After identification of protein pattern with 2-dimensional gel electrophoresis (immobilized pH gradient) and SDS-page Methods, proteins were measured and protein spots were analyzed with progenesis same spot softwares.

**Results:** The results showed, almost all of the proteins in this bacterium are in 10-100 KD and pH around 3.5 to 9.5. In 2-dimensional gel electrophoresis pattern of spiral and coccoid forms of bacterium, expressed proteins pattern are completely different. Among stresses, acidic condition stress has the most changes in protein pattern of spiral *Helicobacter pylori*. 171 proteins spot in spiral form has more expression than form under stress and this differences are mainly in the weight range of 12-36 and 45-78 KD.

**Conclusion:** In the temperature stress of 23, 40 °C, 9 and 50 protein spot were detected respectively, by  $p \leq 0.05$  and  $\text{fold} \geq 1.5$  with spiral without stress form has significance

difference. From spot number aspect, pH=4 has the highest and temperature 40 °C has the lowest difference with protein pattern of spiral form.

**Keywords:** *Helicobacter pylori*; 2-Dimensional Electrophoresis; Stress

