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Research Article

In Individuals with *Helicobacter pylori*-Induced Gastric ulcers, Interleukin-22 Exhibit an important role in immune regulation

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Abstract

Background: *Helicobacter pylori (H. pylori)* is a bacterium that locally colonizes the gastric mucosa and has been increasingly considered as one of the main causes for peptic ulcers, gastritis, certain types of gastric cancer. **Methods:** In this work, 30 participants infected with *H.pylori*, 30 participants infected with *H.pylori* and gastric ulcer. Thirty-healthy participants as control, age rang 18-60 years are enrolled in this study. A physician diagnoses every patient with *H.pylori* and gastric ulcers. IL-22 has been measurement using ELISA technique. **Results:** According to age groups, no-significant differences (P-value0.4256) compare healthy individuals and total patients, no-significant differences (P-value0.0673) between male and female patients. IL-22 serum concentration, significant increase ($P<0.05$) in individuals infected *H.pylori* (9.093 ± 0.405 pg/ml) with control (3.846 ± 0.304 pg/ml), also, there were a significant increase ($P<0.05$) in patients infected with *H.pylori* and gastric ulcer as compare with patients infected with *H.pylori* only. **Conclusion:** IL-22 as a therapeutic target in gastric ulceration induced by *H. pylori*, could open up new possibilities for the development of treatment andprevention strategies.

1. Introduction

Helicobacter pylori (H. pylori) is a bacteria that predominantly infects the gastric mucosa and has been widely recognized as one of the major etiologies for peptic ulcers, gastritis, some cases of gastric cancer [1, 2]. The treatment of choice for *H. pylori* infection is the combination of antibiotics with a proton pump inhibitor. The infection has also been linked with various diseases, including dyspepsia, gastroesophageal reflux disease and vitamin B12 deficiency [3, 4]. Consequently, till now early diagnosis and complete treatment are essential to avoid fatal gastrointestinal complications [5, 6].

In addition, accumulating data indicated the possible role of *H. pylori* as a trigger for extra-gastrointestinal diseases such as cardiovascular and autoimmune diseases [7–9]. Given these associations, more studies are necessary to elucidate the distant health effects of *H. pylori* until potential therapies and prevention measures can be developed.

The immune response is important in the clearing of *H. pylori* infection [10, 11]. Investigating the causal factors of this response is essential for adopting effective interventions and to prevent progression to gastric cancer [12, 13]. Such information may inform the design of vaccines or discovery of immune targets for therapeutic manipulation. Studies on innate and adaptive immune response, also on IL-22, have been brought us a great progress to understand the intricate interaction between *H. pylori* and host immune system which provide new ways for better control or preventive strategies of infection [14]. Collectively, elucidation of the immune response to *H. pylori* is critical for decreasing infection-related sequelae such as gastric neoplasia, and remains a subject of current investigation [15].

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2. Methods

2.1. Individuals

Thirty patients infected with *H.pylori*, 30 patients infected with *H.pylori* and gastric ulcer. Thirty-healthy individuals as control, age rang 18-60 years are enrolled in this study. A physician diagnoses every patient with *H.pylori* and gastric ulcers. IL-22 has been measurement using ELISA technique [16, 17].

2.2. The statistical analysis

The computer program SPSS version 7 was used to do the statistical analysis, and for each value, a mean value and standard error (SE) were acquired. For the statistical analysis, statistically significant P values less than 0.05 were taken into account [18, 19].

3. Results

3.1. Age groups

According to the age groups, there were no significant differences (P value 0.4256) between healthy individuals (35.63 ± 2.227) and total patients (35.15 ± 1.480) Figure 1. Also, the results demonstrated that there were no-significant differences (Pvalue0.0673) between male (37.21 ± 2.257) and female (32.85 ± 1.686) patients Figure 2.

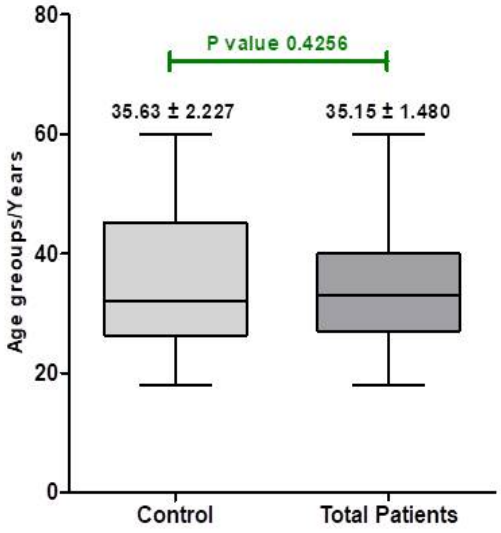

Figure 1: Age groups of control and total patients

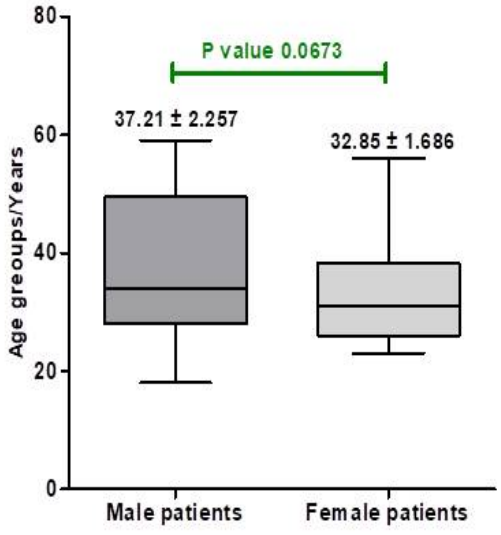

Figure 2: Age groups of male and female patients

3.2. IL-22

The current study's findings showed that patients with *H. pylori* infection had significantly higher blood levels of IL-22 (P<0.05) (9.093 ± 0.405 pg/ml) than the control group (3.846 ± 0.304 pg/ml) Figure 3. Also, the results indicated that there was a higher serum levels in patients infected with *H.pylori* and gastric ulcer (15.84 ± 1.293 pg/ml) as compared with control (3.846 ± 0.304 pg/ml) with significant increase ((P<0.05) Figure 4. However, compared to individuals with *H.pylori* alone, there was a substantial rise (P<0.05) in blood levels of IL-22 in patients with *H.pylori* and stomach ulcers Figure 5.

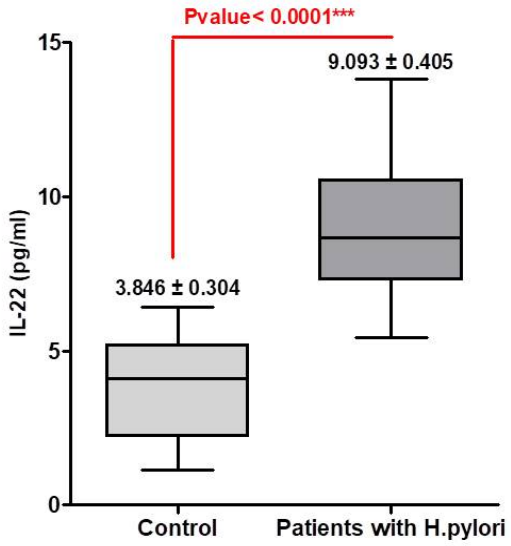

Figure 3: Interleukin-22 Healthy individuals and *H.pylori* patients

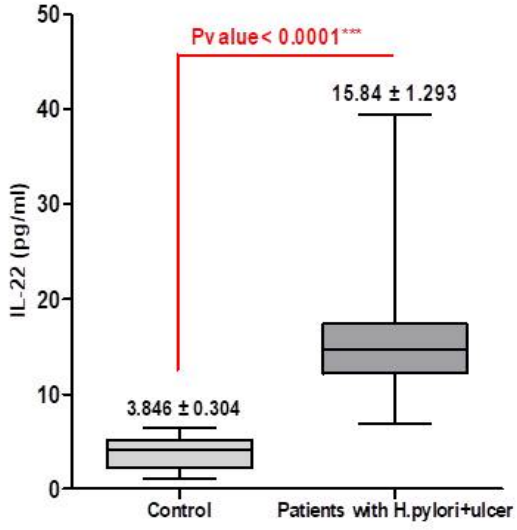

Figure 4: Interleukin-22 Healthy individuals and *H.pylori* and gastric ulcer patients

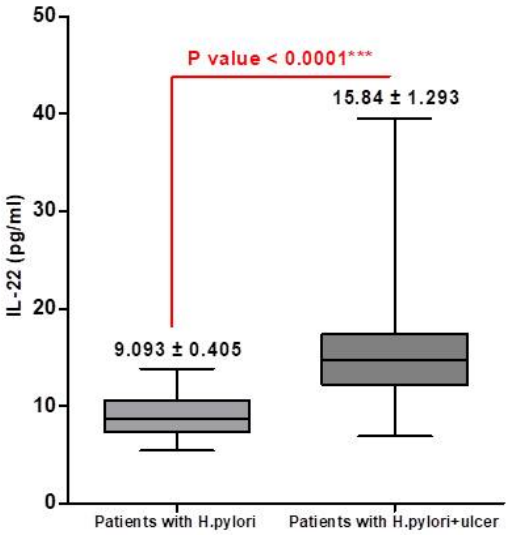

Figure 5: Interleukin-22 *H.pylori* patients and with *H.pylori*+gastric ulcer patients

4. Discussion

A cytokine, which is indispensable for the immune response against *H. pylori* infection is IL-22, it has an epithelial barrier protective and anti-inflammatory properties that also makes it possible to control *H. pylori* colonization and ultimately its disease course [20]. It is, therefore important to explain possible interrelation between IL-22 and *H. pylori* infection which could be advance in drug discovery to target this cytokine during the control of *H. pylori* associated diseases like peptic ulcer [21]. There are strong evidences that the amounts of IL-22 are strongly correlated with the severity of *H. pylori* infection [22]. Consult the appropriate references below. with potential therapeutic implications in the treatment of diseases due to this bacterium such as peptic-ulcers [23, 24]. It is reported that immune-mediated induction of IL-22 is important in *H. pylori* infection-induced gastric ulcer development [25]. Specifically, the cytokine IL-22 has been shown to be critical in induction of gastric ulcer disease following *H. pylori* infection. It is possible that treatment for *H. pylori*-induced gastric ulcer would center on targeted therapy against IL-22 immune response [26]. *H. pylori*-induced gastric ulcers, the treatment of with party-wall breaking IL-22 may give us new ideas in prevention and treatment. The IL-22 immune response and helicobacter pylori induced gastric ulceration: a new perspective on the pathogenesis of disease [27]. Second, further research that could help elucidate how the gastric ulcer for *H. pylori* infection is are possible and could potentially enhance patient survival [28].

5. Conclusion

The use of IL-22 as a therapeutic target for gastric ulcers caused by *H. pylori*-could provide new avenues for treatment and prevention strategies.

Abbreviations

H.pylori: Helicobacter pylori, IL-22: Interleukin-22, ELISA: Enzyme Linked Immuno Sorbent Assay, SE: Standard error

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Author Contributions: Aljanaby collected participants' data, analyzed and interpreted the patient data and performed the laboratory workup. Mohammed is major contributors in writing the manuscript. All authors read and approved the final manuscript.

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Conflict of Interest: The authors declare no conflict of interest.

Data Availability: The required data and materials were all available.

Disclaimer (Artificial Intelligence): The author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc).

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