Helicobacter pylori and type 2 diabetes mellitus. *Negative results and goals of future studies*

To the editor

In the latest decade, several studies have reported on the link between chronic *Helicobacter pylori* (*H. pylori*) infection, and a wide variety of extragastric manifestations.[1] The issue of the potential role of *H. pylori* as a pathogenetic determinant in type 2 diabetes mellitus in the adult population has been investigated by several approaches. From an epidemiological point of view, some reports have shown a higher seroprevalence of *H. pylori* infection in patients with type 2 diabetes mellitus compared to controls.[2] However, other studies have not confirmed these findings.[3] The same controversy is met when searching for the role of the bacterium in the upper gastrointestinal symptoms of diabetics. While some authors have found a correlation with dyspepsia,[4] others did not.[5] Recently, also insulin resistance (IR) has been associated with *H. pylori* infection.[6] Although this study requires further confirmation, it stimulates interest due to the fact that IR is a central feature in the natural history of type 2 diabetes mellitus. From an intervention point of view, some studies have investigated the benefit of *H. pylori* eradication on the level of glycated hemoglobin A (HbA1c) in patients with type 1 diabetes mellitus.[8] The outcome of bacterial cure on type 2 diabetes mellitus was unknown. In a recent issue of Saudi Medical Journal, Moghimi et al[9] have assessed the effect of *H. pylori* eradication on hyperglycemia control in type 2 diabetes mellitus patients. By a randomized design, they compared the HbA1C and fasting blood sugar (FBS) levels in 19 cases, and in 22 controls. The results showed that mean decrease of HbA1C and FBS in the 2 groups presented no significant difference. Hence, they concluded that *H. pylori* treatment has no role in short-term control of type 2 diabetes mellitus.[9] Based on this pilot study, the conclusion is appropriate. Some considerations need to be carried out to planify future investigations on such issue. From a statistical point of view, these data should be reproduced in larger cohort. The sample size is small, and may limit and influence the results due to potential errors. Calculating sample sizes for trials with dichotomous outcomes requires 4 components: an error, power, event rate in the control group, and a treatment effect of interest. Power derives from error. The latter measures the probability of a false-negative conclusion, namely, that 2 treatment does not differ when, in fact, they do.[10] The fact that in this work, the mean decrease in HbAlC level among cases is greater than in controls could encourage this concept. Furthermore, even if underpowered, each trial can be acceptable because it could be combined in meta-analysis. Regarding the design, this is a prospective study, having as advantages the opportunity to provide a direct estimate of the occurrence of events (amelioration of type 2 diabetes mellitus parameters) after intervention. Although well-conducted, the short-term follow-up offers preliminary indications however, it does not permit to drawn a final conclusion. However, type 2 diabetes mellitus is a multifaceted disease and it is unlikely that it can be explained by one cause only. Despite limited by the above cited points, the relevance of such a study is its originality, being one of the first to focalize on the effect of *H. pylori* eradication on type 2 diabetes mellitus. Thus, the work by Moghimi et at,[9] as stated by the authors, should open the way to other future investigations with more adequate statistical criteria and long-term follow-up.

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Reply from the Author

No reply was received from the author.

References

1. Gasbarrini A, Carloni E, Gasbarrini G, Chisholm SA. *Helicobacter pylori* and extragastric diseases- other Helicobacters. ***Helicobacter*** 2004; 9 (Supp 1): I57-I66.
2. Oldenburg B, Diepersloot RJ, Hoekstra JB. High seroprevalence of *Helicobacter pylori* in diabetes mellitus patients. ***Dig Dis Sci*** 1996; 41: 458-461.
3. Xia HH, Talley NJ, Kam EP, Young LJ, Hammer J, Horowitz M. *Helicobacter pylori* infection is not associated with diabetes mellitus, nor with upper gastrointestinal symptoms in diabetes mellitus. ***Am J Gastroenterol*** 2001; 96: 1039-1046.
4. Gulcelik NE, Kaya E, Demirbas B, Culha C, Koc G, Ozkaya M, et al. *Helicobacter pylori* prevalence in diabetic patients and its relationship with dyspepsia and autonomic neuropathy. ***J Endocrinol Invest*** 2005; 28: 214-217.
5. Lo MK, Lee KF, Chan NN, Leung WY, Ko GT, Chan WB, et al. Effects of gender, *Helicobacter pylori* and hepatitis B virus serology status on cardiovascular and renal complications in Chinese type 2 diabetic patients with overt nephropathy. ***Diabetes Obes Metab*** 2004; 6: 223-230.
6. Aydemir S, Bayraktaroglu T, Sert M, Sokmen C, Atmaca H, Mungan G et al. The effect of *Helicobacter pylori* on insulin resistance. ***Dig Dis Sci*** 2005; 50: 2090-2093.
7. Avogaro A. Insulin resistance: trigger or concomitant factor in the metabolic syndrome. ***Panmin-erva Med*** 2006; 48: 3-12.
8. de Luis DA, Cordero JM, Caballero C, Boixeda D, Aller R, Canton R, et al. Effect of the treatment of *Helicobacter pylori* infection on gastric emptying and its influence on the glycaemic control in type 1 diabetes mellitus. ***Diabetes Res Clin Pract*** 2001; 52: 1-9.
9. Moghimi J, Toussy J, Babaei M, Mousavi S, Tamadon M, Karamai M. Effect of *Helicobacter pylori* eradication on short-term control of glycemia in patients with type 2 diabetes mellitus. ***Saudi Med J*** 2007; 28: 475-476.
10. Schulz KF, Grimes DA. Sample size calculations in randomized trials: mandatory and mystical. ***Lancet*** 2005; 365: 1348-53.