

Helicobacter pylori Infection and its Potential Role in Childhood Eczema

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Abstract:

To determine whether *Helicobacter pylori* is associated with childhood eczema. A total of 170 patients with Eczema (atopic dermatitis) who were 2 months to 7 years old and had fulfilled the American Academy of Dermatology Criteria for atopic dermatitis (AD), and a total of 160 healthy controls with no history of atopic condition were matched by country of origin, age, sex, family size, socio-demographic variables and ethnicity to the 170 atopic cases.

Atopic dermatitis (AD) or eczema is a type of dermatitis, an inflammatory, relapsing, non-contagious and itchy skin disorder. It is often chronic in nature. In children under one year of age much of the body may be affected. As they get older the back of the knees and front of the elbows are the most common area for the rash. In adults the hands and feet are the most affected. The cause is believed to involve several factors including; genetics, environmental exposures, and difficulties in permeability of the skin. The diagnosis is based on the signs and symptoms. The ISAAC (International Study of Asthma and Allergies in Childhood) revealed that eczema affects children all over the world, although the disease prevalence varies substantially among countries. The prevalence of eczema is also increasing, especially in developing countries. It has been given names like "[neuro dermatitis](#)", "endogenous eczema" and "infantile eczema".

Approval of this study was received from the administrations of the Hospitals in which the study was conducted in. The routine consents for Laboratory diagnosis were implemented for all cases according to Hospital regulations, and the study protocol conforms to the ethical Guidelines of the 1975 Declaration of Helsinki. Children were recruited through primary care physician offices and Clinics and Norkhan General Hospital (Hafer Al Batin, Saudi Arabia) as well as Al Azhar University Hospitals Cairo, Egypt. All participants between 2 months to 7 years were investigated for *H. pylori* using two laboratory tests.

Cases with presumed atopic dermatitis from 2 months to 7 years old, they should have their diagnosis based on the criteria summarized in Box 1 and according to the American Academy of Dermatology.

Individuals infected with *H. pylori* develop antibodies that significantly correlate with the histologically confirmed cases. It is noteworthy that the geographic distributions of eligible participating children add more strength to the design of the study. There is a good correlation between ELISA antibody test

and rapid urease test, which afford confirmatory diagnosis of *H. pylori* infection. In this study, serum samples were assessed through ELISA for the presence of anti-*H. pylori* IgG antibodies against high molecular weight cell-associated protein (HM-CAP) of *H. pylori* using the HM-CAP ELISA kit (EZ-EM Inc. Westbury, NY, USA) as described previously. All analyses were performed using SPSS (SPSS Inc.). The demographic characteristics of cases and controls were compared using the Fisher exact test, and odds Ratio.

The results of this study suggest that the relationship between childhood eczema and *H. pylori* infection is a complex one. The genetic diversity of *H. pylori* and the variations in human host response to the microorganism underlie the complex host-pathogen relationship that determines the natural history of infection. Since the relationship between infections and eczema is not a simple one, it is not surprising that some studies confirmed the inverse association between eczema/allergic diseases and *H. pylori* infection. Other studies claimed that the association is causal and directly proportional. According to the hygiene hypothesis, when children are brought up exposed to allergens in the environment at a young age, their immune system is more likely to tolerate them, while children brought up in a modern "sanitary" environment are less likely to be exposed to those allergens at a young age, and when they are finally exposed, develop allergies. There is some support for this hypothesis with respect to AD.

The apparent inverse relation between atopic dermatitis and *H. pylori* seropositivity could be expected in atopic infants as atopic infants divert the Th2 type response of *H. pylori* to Th2 type response. As the infant grows up, eventual shift of the predominant Th2 type of response to more of a balance between Th1- and Th2-type responses. The insignificant relation between atopic dermatitis and *H. pylori* stool antigen testing (*H. pylori* colonization) could be explained as follows; *H. pylori* colonization does not necessarily invoke inflammatory immune responses as evidenced by the well documented asymptomatic and subclinical cases of *H. pylori* infections. Moreover, colonization is instantly opposed and antagonized by multiple factors including; competitive inhibition by another gut micro biota or Helminthes or its products, host factors (genetic susceptibility, diet), environmental, geographic variation, and wide usage of antibiotics. All these factors imply disproportionate correlation between colonization and the atopic immunologic response to *H. pylori* infection.

Keywords: *Helicobacter pylori* ; Childhood Eczema; Infection