

Original Research Article

<https://doi.org/10.20546/ijcmas.2018.702.103>Seroprevalence of *Helicobacter pylori* among Healthy Blood DonorsD. Ramya Priyadarshini^{1*}, Joshy M. Easow² and R. Vinod¹¹Department of Microbiology, Sri Venkateshwara Medical College Hospital and Research Centre (SVMCHRC), Puducherry, India²Department of Microbiology, Mahatma Gandhi Medical College and Research Institute, Puducherry, India

*Corresponding

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Helicobacter pylori induces chronic inflammation of the underlying gastric mucosa causing gastritis and other complications. *H. pylori* infection once acquired is believed to persist lifelong unless treated. This is a cross-sectional epidemiological study to find the prevalence of the infection in asymptomatic healthy blood donors attending the SVMCHRC blood bank, Puducherry. Analysis of the sera from 99 apparently healthy subjects, based on the serological determination of the IgM and IgG antibodies against *H. pylori*, was carried out using a commercially available kit ELISA. There were 59 (60%) males and 40 (40%) females with the age range of 18 to 60 years. Overall seropositivity to *Helicobacter pylori* among healthy blood donors was 29.2%. 8 (8.08%) subjects were positive for IgM, 21 (21.2%) subjects were positive for IgG. Age distribution of *H. pylori* infection showed increasing trend in the young age (21-25 years). A moderate increase in the prevalence of *H. pylori* infection among smokers was noticed. Among Tea/Coffee consumers 25(28.7%) showed the presence of antibody. Among 26 alcoholics involved in this study only 8 were found to be positive for IgG and IgM antibodies. Individuals living with low socioeconomic conditions had high prevalence rates of *H. pylori*.

Introduction

Helicobacter pylori are bacterial pathogen present in the luminal surface of gastric epithelium.

It induces chronic inflammation of the underlying gastric mucosa causing gastritis and other complications. Prevalence of this disease varies worldwide being low in developed countries and high in developing countries. *H. pylori* infection once acquired is

believed to persist lifelong unless treated (Klein *et al.*, 1994). Most of the infected individual remains asymptomatic. *H. pylori* infection is a co factor in the development of three important upper gastro intestinal diseases: duodenal or gastric ulcer, gastric cancer and gastric mucosa associated lymphoid tissue (MALT) lymphoma (McColl, 2010). Hence, identifying the antibodies in asymptomatic healthy individual by ELISA and treating them is essential. Blood donors are considered as healthy individuals, hence

their blood samples are examined to determine the seroprevalence of *H. pylori* in population from Puducherry, India.

Materials and Methods

The study was carried out at the Department of Microbiology, Sri Venkateshwara Medical College Hospital and Research Centre, Pondicherry. A total of 99 healthy individuals between 18–60 years old consecutive donors who were asymptomatic and attended the Sri Venkateshwara Medical College Hospital's Blood Bank, between November 2015 and October 2016 were randomly included. The group comprised of 59 males and 40 females with an age range of 18 to 60 years. Subjects who were previously treated for *H. pylori* infection or who had received antibiotics, proton pump inhibitors or bismuth compounds in the preceding 4 weeks were excluded. Under aseptic precautions, 3ml blood was collected from blood bag tube (which does not contain any clotting factor) into vacutainer. It was centrifuged at 3000 revolutions per minute for 10 minutes. Serum was separated. The samples were collected in serum tubes and stored in aliquots at -20°C until analysis. All sera were tested for *H. pylori* IgM and IgG antibodies using ELISA tests (Calbiotech, California, US), according to the standard operating procedures. Ethical clearance was sought and obtained from the SVMCHRC Ethical Committee. Informed written consent was obtained from all subjects before being included in the study. Data was analyzed using Statistical Package for Social Sciences (SPSS), version 21.0.

Results and Discussion

A total of 99 subjects were included in the study. All the 99 subjects, serum samples were tested for the presence of *Helicobacter pylori* specific IgG and IgM. 8 (8.08%) subjects were positive for IgM *i.e.* they are currently

infected with *Helicobacter pylori* (Figure 1). 21 (21.2%) subjects were positive for IgG *i.e.* they had previous *H. pylori* infection and developed antibody. Overall seropositivity to *Helicobacter pylori* among healthy blood donors was 29.2%. Percentage of *H. pylori* infection was most commonly seen among young adults of age group 21-25 years (Figure 2). Individuals living with low socioeconomic conditions had high prevalence rates of *H. pylori* (Figure 3). Male preponderance was seen with 59 (60%) males detected to have *H. pylori* antibodies compared to 40 (40%) females (Table 1). Cigarette smoking and Coffee consumption increased the risk of *H. pylori* (Figure 4).

It is difficult for the investigators on *H. pylori* to have sufficient number of adults without gastrointestinal disorders to establish normal prevalence in the healthy population. The only available non-invasive test, the urea breath test is very expensive. Of less invasive tests, serology is most convenient. In this study, the aim was to establish seroprevalence rate among healthy population. Hospital based controls were used, those donating blood, so that blood for ELISA could be drawn when collecting blood without having to subject the individual to venepuncture merely for research purpose.

In this study, there is a significant difference in the prevalence based on gender. This is in concordance with the study results of Kaore *et al.*, (2012) showed higher prevalence in male gender. Age distribution of *H. pylori* infection in this study showed increasing trend in the young age (21-25 years).

This is similar to the observations laid by Tarkhashvili *et al.*, (2009) Shokrzadeh *et al.*, (2012) and Kaore, *et al.*, (2012) which reported increased *H. pylori* infection in age groups of 20-40 years than the older age group.

Cigarette smoking is an important factor in peptic ulcer disease and dyspeptic symptoms. Since the use of tobacco impairs the immune system (Cope *et al.*, 1992), it was speculated that current cigarette smokers are predisposed to infection. This was examined in a prospective study of patients attending for endoscopy using urease testing. It is known that the link between peptic ulcer and smoking cannot be explained by changes in acid output (Kaufmann D *et al.*, 1990).

In this study a moderate but not significant increase in the prevalence of *H. pylori* infection among smokers was noticed (Figure 4). A limitation of the study is the fact that information on smoking and on alcohol and coffee consumption was ascertained by a self-administered questionnaire without verification by biological markers.

Self-reports of smoking are typically reasonably accurate (Patrick *et al.*, 1994), but we believe that alcohol consumption, as in other epidemiological studies, has probably been underreported to some extent. Such underreporting could not have produced the observed patterns if alcohol consumption was unrelated to *H. pylori* infection (Brenner *et al.*, 1994).

In this study out of total 99 individuals, 87 consumes tea/coffee, among them 25(28.7%) showed the presence of antibody (Figure 4). The positive relation between coffee/tea consumption and *H. pylori* infection identified in our study is consistent with results from a cohort study among epidemiologists in which the risk of seroconversion (change from negative to positive results for antibodies to *H. pylori* in serum was 4.6 times higher among those who drank more than 2 cups of caffeinated drinks a day than among the others (Parsonnet *et al.*, 1992). The mechanisms underlying this association require further research.

Among 26 alcoholics involved in this study only 8 were found to be positive for IgG and IgM antibodies (Figure 4). Several studies have reported the relation between alcohol consumption and *H. pylori* infection (Graham *et al.*, 1991; Paunio *et al.*, 1994). Most of them did not find a significant association. A study from Finland found a positive association between alcohol consumption and *H. pylori* infection among younger people (aged 18-35) and a negative association among older age groups (>46) (Paunio *et al.*, 1994). Yet, interpretation and generalization of these findings are difficult because the study was conducted among military staff who had endoscopy for gastric complaints and who drank heavily. The reason for the differences between our results and previous results on the role of alcohol consumption may be how infection was measured. Most previous studies used IgG titres to measure infection (Graham *et al.*, 1991; Paunio *et al.*, 1994).

High IgG titres may persist after elimination of active infection (Meyer *et al.*, 1991), so elimination of infection resulting from alcohol consumption might be missed in studies using IgG titres as markers of infection. Individuals living in countries with low socioeconomic conditions had high prevalence rates of *H. pylori* acquired at an early age (Ally R *et al.*, 1999). WHO found that the majority of infections occurred in young and middle age groups (25–50 years) more than in other age groups and the factors that predispose the higher colonization rates included poor socioeconomic status and less education in addition to genetic factors. The explanations for the present study are in agreement with approved results of other studies which were mainly due to socioeconomic status and the sample size of the population studied, type of patients, location of the study as well as the mode of transmission whereby spread infection was acquired from person to person or by oral-oral or feco-oral routes.

Fig.1 Prevalence of seropositivity to *H. pylori* antibodies by different antibody class

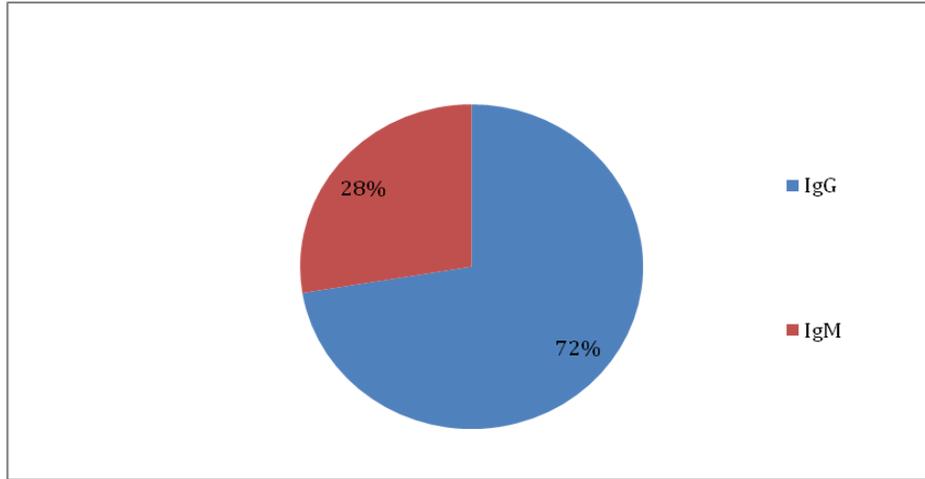


Fig.2 Frequency of detection of antibody classes of *H. pylori* infection among adult blood donors according to age

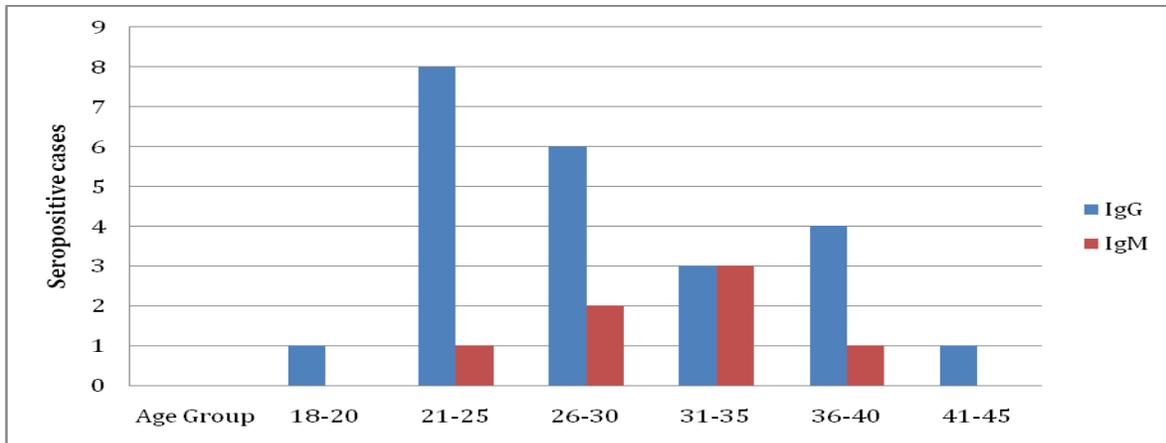


Fig.3 Frequency of detection of antibody classes of *H. pylori* infection among adult blood donors based on Socio economic class

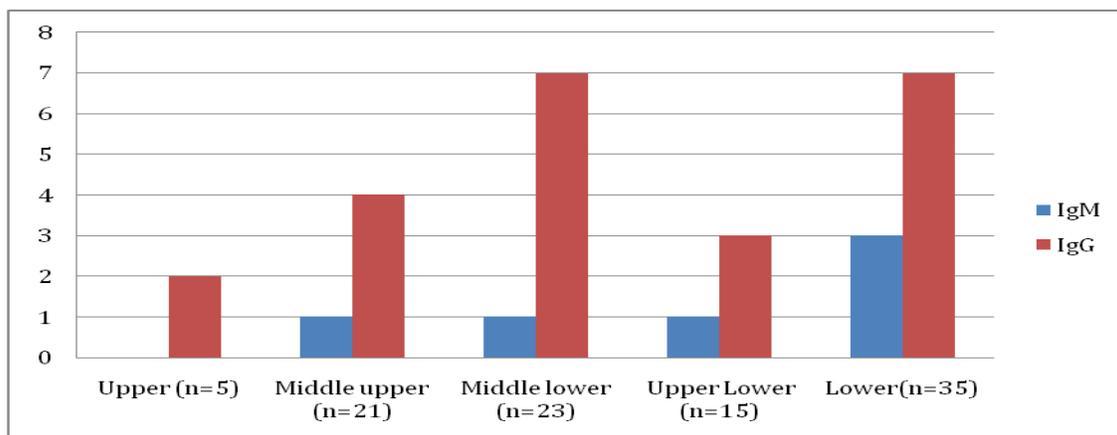


Fig.4 Lifestyle factors influencing *H. pylori* infection

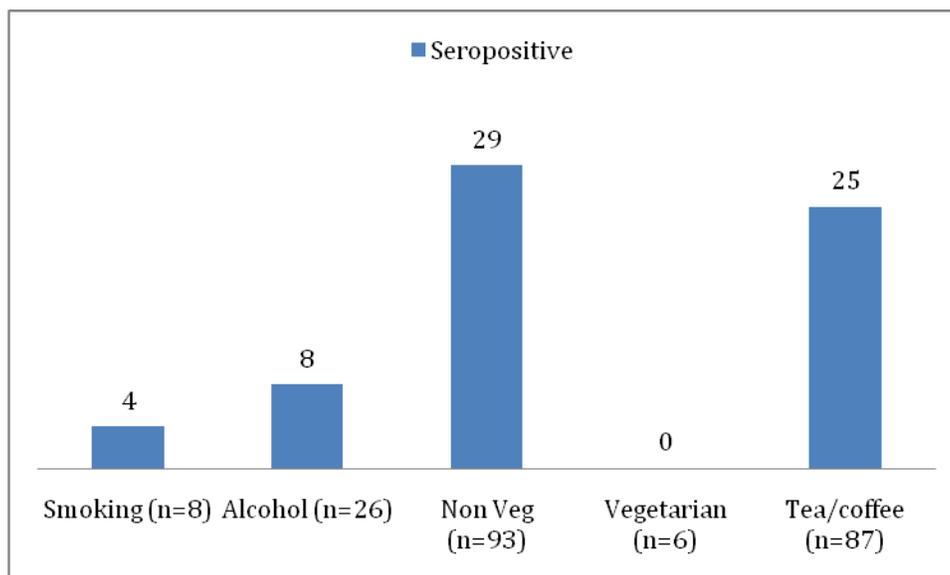


Table.1 *H. pylori* Infection distribution based on gender

Gender	IgG		IgM	
	Number	Percentage	Number	Percentage
Male (n=59)	14	23.7%	4	6.77%
Female (n=40)	7	17.5%	4	6.77%

The present study has a major limitation that association of *H. pylori* infection with life-style related modifiable factors was not accessed. There is a need of another broader study in this region, assessing the association of different demographic and life-style factors and pre-existing conditions like diabetes mellitus with prevalence of *H. pylori* infection and follow-up of the patients after treatment and life-style modifications.

Although *H. pylori* infection is commonly acquired during childhood, active infection may be acquired and eliminated throughout adulthood. This study of patients in a general practice found no significant relation between smoking and active *H. pylori* infection. Drinking alcohol seemed to protect against active *H. pylori* infection. This protective effect was dose dependent. Drinking coffee was associated with an increased prevalence

of active *H. pylori* infection. The protective effect of alcohol on active *H. pylori* infection may be related to its antimicrobial effects.

A set of serological tests may give more accurate determinations of *H. pylori* infection than one test detecting specific antibody or bacterial antigen. In this study, only one serological test was performed, which showed *H. pylori* seropositivity was 21% by ELISA IgG antibodies.

When the infection was contracted is important, especially because *H. pylori* is known as a life-long infection and it colonizes the human stomach for a long period of time until it causes severe infections; thus, individuals might be infected recently and more severe complications have yet to be produced. Though, the prevalence of *H. pylori* gastritis and associated abdominal symptoms

are high in number, serious gastrointestinal complications develop in few. Absolute prevention of these complications and relief from the distressing abdominal symptoms can be achieved through early detection by conventional and affordable diagnostic methods and empirical treatment with anti *H. pylori* therapy.

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