

## Seroepidemiologic Study of *Chlamydia pneumoniae* in the Infarcted Patients among Citizen of Yazd, Iran

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**Abstract:** Objectives: Myocardial Infarction (MI) is one of the most important death factors in the whole world. Today, it is well known that some bacteria and viruses species play a vital role in MI manifestation. *C. Pneumoniae* is considered to be such a bacterium. The general purpose of the cross-sectional study was to determine the correlation between the MI and *C. Pneumoniae* infection. Methods: 103 infarcted patients along with 75 healthy people as control with the similar demographic status were selected for this study. Following titrating IgG and IgM using ELISA technique for detecting of antibodies against *C. Pneumoniae* all patient's serum was furthering examined for determination of sugar, CRP cholesterol and triglyceride. Simultaneously, demographic status such as blood pressure, family history and addiction to cigarettes were recorded. At the end, any case or control having the above risk factor was eliminated from the study. Results: Result showed that 92 (89.3%) of serum samples from patients and 58 (77.2%) of controls were positive for IgG; whereas only, 2 patient's serum samples were positive for IgM. Prevalence of IgG positive in the patients regarding sex was in significant, although it was found to be significant for age ( $p = 0.03$ ). Conclusion: Although, the case numbers were limited, but it may be concluded that the infection is prevalent among the residents in yazd and the silent infection could be the causative factor in manifestation of acute MI.

**Key words:** Myocardial infarction • *C. Pneumoniae* • seroepidemiology

### INTRODUCTION

Atherosclerosis particularly Myocardial Infarction (MI) is one of the most important cause of morbidity and mortality in the whole world. Smoking, diabetes, dyslipidemias and Hypertension are all well known as risk factors in heart diseases [1-3].

Recently, several studies implicated that both viral and bacterial infections play a vital role in development of atherosclerosis [2, 4, 5]. Among different species reported, *C. Pneumoniae* has been high lighted the most in relation with coronary heart diseases [5-8].

Initially, evidence of this association was based on seroepidemiologic studies and more recently the presence of *C. Pneumoniae* in atheromatous plaques has been shown by electron microscopy and immunocytochemical staining, as well as PCR testing of coronary carotid and aortic atheroma [7, 9, 10].

Several studies using PCR revealed that *C. Pneumoniae* has colonized the coronary artery during its infection in the body. The aim of this study was to evaluate the prevalence of *C. Pneumoniae* infection among patients with MI, by antibody detection (IgM, IgG) using ELISA technique.

### MATERIALS AND METHOD

The present study was a descriptive and cross-sectional in which 103 patients (75 male, 28 female) with acute myocardial infarction confirmed by cardiologist immediately after admission to emergency ward.

Consequently, 75 healthy individual (53 male and 22 female) were invited to participate the survey as control group. The control group had no any history of cardiovascular events and their gender together with age were tried to be matched as with cases.

A questionnaire was completed for each subject including patients family history, symptoms, risk factors concerning heart disease such as: smoking, diabetes, hypertension and dyslipidemias. For each individual, blood sample was collected on admission in two tubes. Following centrifugation to separate the serum, one sample was kept at 4°C and the other samples was sent to the laboratory for further blood tests such as cholesterol, triglyceride, CRP, sugar, uric acid and urea.

Detection of antibody as IgG and IgM against *C. Pneumoniae* was performed according to manufacturer protocol (Helsinki, Finland). Following the method recommended by kit manual, the calculation and statistical analysis were done according to the given protocol.

Data were analysed using spss program, then all patients and control groups with risk factors were eliminated from this survey.

The proposal of the present work was reviewed and considered by ethical committee and confirmed for further performance.

### RESULTS

Table 1 summarizes the baseline characteristic of both case and control subjects of 103 admitted patients. 92 (89.3%) of cases and 58 (77.3%) of controls had a high titer of IgG to *C. Pneumoniae*. Using chi-square, the percentage of cases IgG compared to control was found to be significant (P 0.03). Measurement of odd ratio showed that risk of MI in IgG positive subjects were 2.45 greater than the IgG negative subjects. When the data were analysed according to sex among male and female, the prevalence of IgG positive was found no significant in both case and control groups (p = 0.422). Note that IgM was negative in both. Cases and control

Table 1: Prevalence of IgG against *C. Pneumoniae* in cases and control

Groups	*IgG +		IgG-		Total	
	No.	%	No.	%	No.	%
Cases	92	89.3	11	10.7	103	100
Controls	58	77.3	17	22.7	75	100
Total	150	84.3	28	15.7	178	100

\* IgG detection in cases was significantly higher than the control group: p = 0.03

### DISCUSSION

Traditionally, the cause of atherosclerosis has emphasized on classic risk profiles, including hyperlipidemia, hypertension, diabetes, tobacco abuse, age, sex and familiar history of premature vascular disease [2].

In recent years, medical literatures have shown that *C. Pneumoniae* plays a role in coronary atherosclerotic disease [1, 2, 4, 5].

The present study examined the sero status for *C. Pneumoniae* in patients with an acute cardiovascular event. As Table 1 shows a total of 103 serum samples were tested. 92 (89.3%) of patients and 58 (77.3%) of control groups were positive for IgG using ELISA technique. The results obtained show that there is a correlation between MI and *C. Pneumoniae* infection. In contrast to our finding Nobel *et al.* [12, 13] did not observe any correlation between the *C. Pneumoniae* and MI. However, several seroepidemiology studies revealed from USA and some European countries have strongly supported the direct role of chlamydial infection in manifestation of coronary heart disease [4, 9, 14]. The difference between the results obtained from Nobel's and some other observers including a survey in Iran [12] could be related to low number of cases and control (total 116 in Nobel study) they applied in their investigation.

It also should be noted that only ELISA was used for detection of *C. Pneumoniae* in the present study, whereas others recent study applied both ELISA and Micro Immunofluorescence Assay (MIFA) in order to confirm their findings [5, 8-10]. However the results generated from our study would match the data collected from the past studies.

Although, the case numbers were limited, but it may be concluded that the infection is prevalent among the residents in Yazd and the silent infection could be the causative factor in manifestation of acute MI.

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