

Comparison of Serum CRP in Migraine Sufferers and Normal Population

Hosseinali Salehi,¹ Mohammad Aminianfar,^{*2} Alireza Ranjbar-Naeni,¹ Aliasghar Saidi,² Fariba Rastgoo³

1. Department of Neurology, AJA University of Medical Sciences, Tehran, Iran
2. Department of Infectious and Tropical disease, AJA University of Medical Sciences, Tehran, Iran
3. General Physician, Tehran, Iran

Article information	Abstract
<p>Article history: Received: 26 Apr 2012 Accepted: 12 July 2012 Available online: 27 Jan 2013 ZJRMS 2014; 16(1): 13-16</p> <p>Keywords: Migraine headache Cerebral arteries Inflammation</p> <p>*Corresponding author at: Department of Infectious Disease, AJA University of Medical Sciences, Tehran, Iran E-mail: maminianfar@yahoo.com</p>	<p>Background: CRP (C-reactive protein) is one of the known inflammatory markers in the body. Studies claim that the level of this marker in patients with migraine is higher than normal peoples. Despite the result of various studies, even the relation between serum CRP and migraine is not detected thoroughly and is in a halo of ambiguity, therefore in this study, we intended to assess the relation between migraine and serum CRP levels.</p> <p>Materials and Methods: The present study was performed as a case-control on 47 migraine suffers that presented Besat hospital on year 2011, at intervals between their attacks and 50 normal individuals. Serum CRP level was measured at interval between attacks or at least 72 hour after the completion of the last attack and was compared with obtained results from normal population.</p> <p>Results: The comparison of CRP level in two groups, indicated that the median CRP at case group was 16.40 mg/dl and at control group 9.76 mg/dl ($p \leq 0.05$). The comparison of CRP median between the sufferers of classic migraine, migraine without aura and individuals without migraine, indicated that the CRP median difference at without aura migraine sufferers and normal population was not meaningful, but classic migraine suffers had higher serum CRP level than the other two groups.</p> <p>Conclusion: Finally, we should stay that the present study demonstrate that CRP inflammatory marker was higher at migraine suffers in comparison with normal general population and could explained the role of inflammation in creation and progression of this type of headache.</p>

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Introduction

Headaches had been one of the problems people had encountered with so many times from the very old days. Due to the fact that several causes had mentioned for headaches, differential diagnosis of headache could be an effective move towards a correct diagnosis and successful treatment of headaches [1]. The most valid one was published by International Headache Society (HIS). These criteria for migraine headache include pulse quality, length of a one day (between 4 to 72 hours), unilateral nature of it, nausea or vomiting, and severe disability.

Migraine has two clinical manifestations: migraine with aura and without aura. In migraine with aura mode, one of the following symptoms would often be observed before headache. Visual symptoms, motional weakness, sensory symptoms, numbness and tingling sensations, speech disorder, brain stem symptoms. Although aura often appears before headache, Martin et al. showed that sometimes aura occurs during headache and some other times it would occur without headache [2]. Migraine headache results from activation of trigeminal nerve branches. Cerebral vasodilatation of brain nerves following nerve stimulation resulting from pain may be the main two causes of inflammatory process of migraine headaches. Various nerve vasodilators in cerebral nerves include: Vasoactive Intestinal Peptide (VIP), Peptide

Histidine Isoleucine (PHI), Neuropeptide Y (Nry), Substance p (sp) and Calcitonin Gene Related Peptide (CGRP) [3].

These materials would be blocked with anti-migraine drugs [4]. These materials lead to dilate dora vessels and increase blood flow and cause buildup of fluid in tissues and localized edema [5]. Finally it should be mentioned that source of migraine pains are inflammation and inflammatory response [6].

C reactive protein (CRP) is one of known inflammatory markers in the body. Lowe et al. study showed that level of this marker has a relationship with getting cardiovascular diseases. Level of this marker in patients with cardiovascular diseases is higher than healthy people [7]. Moreover, Welth et al. study showed that level of this marker in patients with migraine is higher than healthy people which probably are resulted from recurrent inflammation in cerebral vessels [8]. On other hand, Kunrth et al. [9] and Busser et al. [10] studies showed that risk of getting stroke and coronary artery diseases in patients with migraine is higher than other healthy people. Furthermore, this risk-taking in classic migraine (with aura) is higher than one without aura. According to results of various studies, the relationship between CRP serum and getting migraine is not completely clear yet and it is still ambiguous. Therefore, we attempted to measure the

relationship between getting migraine and CRP serum level by eliminating confounding results and preferably making equal samples and control group.

Materials and Methods

This study was done as a case-control study on migraine patients who visited Beasat hospital between migraine attacks in 2011 among 50 normal people. Sample size of the study was determined using statistical relationships and considering maximum amount for variance of trait distribution in a population consisted of about 49 people for each group. Sampling method was easy and available: all the ones with headaches who visited this organization who were confirmed by HIS diagnosis criteria. People who were under 18 and over 35 years old, persons with BMI<18, BMI>30, patients with hypercholesterolemia, diabetes, HTN, pregnant women, history of cardiovascular disease and use of drugs other than OCP were excluded from the sample (studies had shown effectiveness of BMI and metabolic factors on this disease [11], also because age of prevalence of migraine is in this range-under 18 and over 35 years old - so this study was done in this age range). For control group, all above consideration was taken into account too. Furthermore, those with non-migraine chronic headaches, those who complained from non-migraine headaches with moderate and high intensity or those who mentioned history of migraine in their first-degree relatives, were excluded from the sample. Methodology of this research was as follows: patients who complained from headache were examined and interviewed till adequate/essential sample size was collected. Those patients, whose migraine diagnosis was confirmed, by considering criteria for excluding from the study, were entered in the study. For these patients, CRP serum level was measured between migraine attacks or at least after 72 hours passed from the last attack. For control group, after interviewing and examining, 50 individuals were selected among present healthy ones in the hospital, persons with the patients or those people who were under general health screening. Then they were entered in the study. Data collection was done as field data collection including interviews and examination of patients, measuring CRP serum levels and registering them in a checklist. Finally obtained results were analyzed using SPSS-16 software and independent *t*-test was used for comparing means. For ethical considerations, patients were being assured that their information would be kept in private and only would be used for clinical study. Moreover, patients who were not willing to participate in the study were excluded from it. Finding' level of significance was considered as $p \leq 0.05$.

Results

This study were done on 97 individuals in which 47 persons were patients with migraine (case study group) (48.5%) and 50 other individuals were healthy ones that were entered in the study as control group for comparing them based on above-mentioned criteria (51.5%) 37 males

and (38.1% vs. 61.9%) 60 females were present in the population. Comparing two groups of case study and control group considering sex showed that in case study group, 19 male (40.4%) and 28 female (59.6%) and in control group, 18 male (36%) and 32 female (64%) were present (Fig. 1).

Investigating CRP serum level in population showed that its mean serum level was 12.98 mg/dl, its maximum level was 1.6 mg/dl and its minimum level was 5.1 mg/dl (Table 1).

Comparing CRP level in two groups of control and case study showed that this material in case study group was 16.40 mg/dl and in control group was 9.76 mg/dl. These differences were reported significant statistically ($p=0.01$) (Table 2). However comparing CRP level in females and males showed no significant differences and it was 16.53 mg/dlit compared to 16.21 mg/dlit (Table 3).

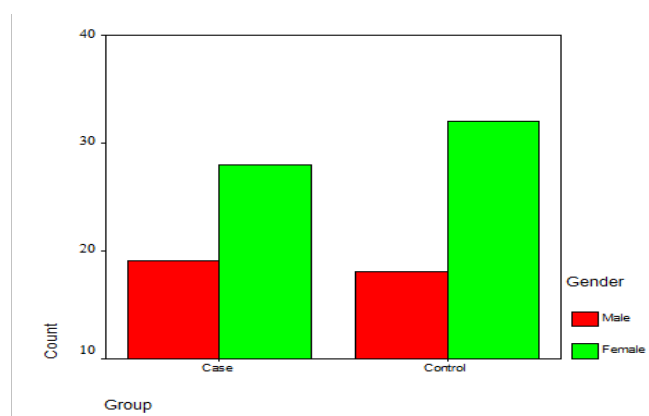


Figure 1. Comparing sex in two groups of case-study and control in population under study

Table 1. Relative and absolute frequency of CRP serum level

CRP mean for population under study	12.98 mg/dl
Minimum level of CRP	1.6 mg/dl
Maximum level of CRP	50.1 mg/dl
Standard deviation	9.21 mg/dl
Total CRP	97

Table 2. Comparing CRP serum level in two groups of control and case study

Group	N	Mean±SD	Std. Error(Mean)
CRP Case	47	16.42±10.49	1.5312
CRP Control	50	9.766±6.41	0.9071

Table 3. Comparing CRP serum level in females and males

Gender	N	Mean±SD	Std. Error(Mean)
CRP Male	19	16.211±9.88	2.2683
CRP Female	28	16.532±11.06	2.0919

Discussion

The relationship between migraine and inflammatory process were considered by researchers and practitioners from the very old days. Confirming existence of this relationship led to change treatment approach of this disease and made clearer the relationship between this

chronic disease with other systematic vascular diseases like CVA and involvement of coronary vessels. This study attempted to investigate this relationship more and more. Results of our study showed that CRP serum level in patients with migraine (case study group) was more significant compared to other healthy people of the population. In other words, involvement of inflammatory process in development or making migraine headache was confirmed. These findings corresponded with results of similar studies.

Vanmolkot et al. [12] and Tietjen et al. [13] studies reported similar results, while massive study of Scher et al. [14] reported no difference between patients with migraine and healthy people considering CRP level. This difference could be resulted from difference in populations and excluding and including criteria for patient in these studies. Although Scher population study was large, exact and absolute criteria were not considered for participants as one in previous studies because of investigating participants' patients in two cohort groups, while studies confirming serum CRP level and migraine relationship had all exactly investigated patients with migraine who had no other risk factor for CRP level change. Performing larger studies with focusing on exact sampling and elimination of confounding factors could find more exact and clearer response for this question. Other finding of this study was non-effectiveness of sex on relationship between CRP and getting migraine headache. Although Tietjen et al. study had more emphasized on females in population, results of our study showed that sex is not an effective factor on changing relationship between CRP and migraine headache [13].

The results about time period of getting migraine (more or lower than one year), intensity of headache (more than 1 days in a month or lower than that), positive relative history for migraine headache, were similar to sex, but the imperative point in this regard was the fact that this study had not focused on confounding factors in patients with migraine. According to the fact that this study had been designed for other reason and obtained results were only lateral findings along with the main purpose, maybe performing studies with larger population and also

focusing more on demographic factors and clinical findings would better identify role of these factors on this disease. However, other significant finding in this study was the relationship between migraine type and CRP serum level.

Our results showed that group of patients with classic migraine clearly had higher CRP serum level compared to patients with migraine headache without Aura and other healthy people, but differences between group with migraine without Aura and control group were not significant. In other words, CRP level in patients with classic migraine was higher compared to other forms of migraine and other healthy people. However, these results did not correspond with Vanmolkot's findings because he reported that CRP level in patients with migraine without Aura was higher compared to other groups [12]. This difference, as it was mentioned before, are resulted from not focusing on sub-categories of migraine headache as well as not performing larger studies on patients with migraine without Aura; comparing these two groups would obtain reports of more exact results. Finally it should be stated that this research showed that CRP inflammatory marker is higher in patients with migraine compared to other healthy people and could promise role of inflammation in making and development of this headache.

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Authors' Contributions

All authors had equal role in design, work, statistical analysis and manuscript writing.

Conflict of Interest

The authors declare no conflict of interest.

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