Original Article

Prevalence of Anemia and New Onset Atrial Fibrillation in Patient Come to Imam Hossein Hospital Emergency Department

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Abstract

Background: Recognition of association between anemia and new onset atrial fibrillation would result in better therapeutic approaches and better prognosis. Hence, the purpose was to determine the prevalence of anemia and new onset atrial fibrillation (AF) in patient come to Imam Hossein hospital emergency department.

Materials and Methods: In the observational study that performed as a case-control survey, 150 consecutive addicted patients in imam hossein hospital emergency department in 2018 were enrolled including those with and without AF in electrocardiogram (EKG) and the frequency rate of anemia among groups was determined and compared.

Results: The results in this study demonstrated that 43 patients (27.8%) had anemia that was seen in 36% and 21.3% in case and control groups, respectively with statistically significant difference (p=0.047).

Conclusion: Totally, according to the obtained results there was significant association between anemia and new onset atrial fibrillation.

Keywords: Anemia, Atrial fibrillation, Risk Factor

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Introduction

Atrial fibrillation (AF) is a common cardiac arrhythmia with prevalence range of 0.1 to 4 percent in general population and 2.8 to 14 percent among admitted patients[1]. The prevalence is raised with age[2] with total prevalence rate of 2.1 percent[3]. However there is increasing trend in current years with 2.5-fold increase[2,4] with some ethnic differences[5]. The prevalence may rise to nine percent in high-elderly period[6]. It is accompanied with high rate of myocardial infarction with five-fold increase that is more lethal with higher costs[6-8]. AF is the most common cardiac arrhythmia among adults[9,10]. Since AF and anemia may be increased with age and both are accompanied with high morbidity and mortality rate recognition of anemia as risk factors for new onset AF is important. Regarding the increasing rate with age[11,12] and increased elderly ratio in communities[13] AF should receive further attention especially among men and white race subjects[14]. AF is accompanied with two-fold higher mortality rate[15] and there are some risk factors such as atrial ischemia, inflammation, drugs[16,17]. On the other hand, anemia is also common and seen in nearly one-fourth in general population[18]. It is risk factor for cardiac ischemia and failure[19-21]. Simultaneous presence of AF and anemia would result in further background diseases[22] and anemia is dependently

accompanied with higher mortality rate[23]. Recognition of association between anemia and new onset atrial fibrillation would result in better therapeutic approaches[24] and better prognosis. Hence, the purpose was to determine the prevalence of anemia and new onset atrial fibrillation in patient come to imam hossein hospital emergency department.

Methods

In the observational study that performed as a case-control survey, 150 consecutive addicted patients in imam hossein hospital emergency department in 2018 were enrolled including those with and without AF in electrocardiogram (EKG or ECG). The inclusion criteria were new-onset AF in case and lack of it in control group. In addition, the exclusion criteria were congestive heart failure (CHF) in echocardiography, hypothyroidism, cardiomyopathy, active ischemia, hypertension, obesity, chronic obstructive pulmonary disease (COPD), and acute anemia due to bleeding and hemolysis.

Patients were two groups of 75 subjects that were enrolled after signing the informed consent form were assessed by ECG and new onset AF cases underwent echocardiography and if had no exclusion criteria were enrolled. Then complete blood count (CBC) was assessed and the frequency rate of anemia among groups was determined and compared. It was according to the WHO definition (Hb less than 14 and 12 g/dl in men and women, respectively). Also the type was assessed according to B12, folate, ferritin, TIBC, and SI.

Data analysis was dome by SPSS version 20.0 software. The mean and standard deviation were determined for numerical variables and frequency and percent were measured for categorical ones. The used tests were Independent-Sample-T, Chi-Square, and odds ratio with significance level of less than 0.05.

Results

The age and gender were alike across the groups (Table 1) with male frequency of 47 and 42 in case and control groups, respectively. The results in this study demonstrated that 43 patients (27.8%) had anemia that was seen in 36% and 21.3% in case and control groups, respectively with statistically significant difference (P=0.047).

There was significant association for men but not for women (Table 2). As shown in Table 3, there was no significant difference between AF and hemoglobin level (p>0.05). However it was seen in men (p=0.004) but not women (p>0.05).

The anemia type was iron-deficiency, chronic-disease, and megaloblastic type in 43, 29, and 13 cases. Type of anemia was not related to AF and age (p>0.05) and it was not related to gender in AF group but in control group (p=0.017) with higher iron-deficiency anemia among females. In addition, the anemia was related to gender in control group (p=0.006) and it was higher in females. Age was not related to anemia (p>0.05). The anemia was subdivided into groups of mild (Hb of 12-14), moderate (Hb of 10-12), and severe (Hb<10). As shown in Table 4, the severity was differed between groups in male subjects. However, it was not differed among females as well as total population (p>0.05).

Discussion

In this case-control study, it was seen that nearly 28 percent had anemia that had higher frequency rate among AF cases. Lack of association between age and anemia in this study may be due to exclusion of cases with acute and lethal conditions. It is the power of our study and a novelty in current paper that would result in higher specificity beside the association of anemia severity and AF. The association of anemia severity with AF was significant in men and non-significant in women that may be due to tolerance of physiological anemia among women during the life. However totally the AF and anemia severity were not related that was unexpected because the male predominance was present in this study.

Lakkireddi et al[25] reported possible significant etiological association between AF and anemia and necessity for further studies as well as our paper. In addition, Ganga et al[26] reported rates of 7.5% and 5.5% for AF in those with and without anemia that showed no association between anemia and AF among elderly subjects. However, we had different results due to wider studied age range. The study by Xu et al[27] reported 1.5-fole increased risk for new-onset AF in patients with anemia as seen in our study.

Keskin et al[28] reported higher rate of iron deficiency anemia among cases with new-onset AF but not those

Table 1: Mean age across the groups.

Group	Mean	Standard Deviation	P value
AF	62.6	11.24	0.647
Control	61.8	12.96	

Table 2: Association of anemia and AF in two genders.

Gender	Group	Anemia	Without anemia	P value
	AF	17	30	0.003
	Control	4	38	
	AF	10	12	0.958
	Control	18	21	

Table 3: Association of hemoglobin and AF.

Group	Mean	Standard Deviation	P value
AF	13.78	1.78	0.566
Control	13.96	2.07	

Table 4: Anemia severity across the groups among male subjects.

Group	AF	Control	P-value
Mild	13	4	
Moderate	4	0	0.009
Normal	30	38	

due to folate or B12 deficiency. However, in current study the type of anemia was not differed between case and control groups, respectively. Hu et al[29] reported higher AF rate in patients with aplastic anemia. However, none of the patients in our study had aplastic anemia. Study by Lin et al[30] demonstrated that anemia in AF cases may be due to used drugs such as digoxin. However, the drug history in our study was negative.

Conclusion

Totally, according to the obtained results it may be concluded that there is significant association between anemia and new onset atrial fibrillation. Hence, treatment of anemia would result in decreased rate of AF and subsequent problems. However, further studies with larger sample size and multi-center samplings are required to attain more compatible definite results.

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