



Diagnosis of pulmonary embolism in patients mean platelet volume, neutrophil / lymphocyte ratio and platelet / lymphocyte ratio 's foresight

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Abstract

Pulmonary thromboembolic (PTE) is a disease the mortality and the incidence of which is high. Diagnosing PTE can be overlooked because PTE hasn't a hard and an original clinic tableau. Recently, new marker studies continue in the diagnosis and the mortality prudence of MPV, NLR and PLR in pulmonary embolic diagnosis. Also, in our study we purposed to search the foresight of MPV, NLR and PLR in the diagnosis of pulmonary embolic. Through the patients who applied to our emergency room between 1 January 2014 and 1 January 2015, 42 patients diagnosed with pulmonary thromboembolic were taken by scanning retrospective. Thirty healthy people were taken to study for control group. The average age of 42 patients taken to study was $67,90 \pm 14,85$. 24 (%57,1) of patients are women and 18 (%42,9) of are men. The average D-dimer of patients was $5052,40 \pm 5839,95$, the average PLR was $0,19 \pm 0,12$, the average NLR was $8,07 \pm 6,00$ and the average MPV was $9,95 \pm 1,01$. In the control group, the average PLR was $0,18 \pm 0,19$, the average NLR was $4,34 \pm 4,26$ and the average MPV was $8,79 \pm 0,57$. The average MPV, NLR and PLR of patient's group was higher than control group's. When comparing the patients' and the control's group, NLR and MPV was significantly high ($p < 0.005$) but PLR was not significantly high. In our study when we compare the group of patients and control, NLR was significantly high but PLR wasn't.

Keywords: Pulmonary thromboemboli, MPV, NLR, PLR

Introduction

Pulmonary thromboembolic (PTE) is a disease the mortality and the incidence of which is high. Diagnosing PTE can be overlooked because PTE hasn't a hard and an original clinic tableau [1]. PTE occurs consequence of blocking pulmonary artery or/and branches. Its source is deep leg veins [2]. Although PTE is related to the causes of surgery, trauma, immobilization, the story of hospitalization, pregnancy, using estrogen and thrombophilia, PTE may not have the rate %30-50 predisposing factor. Systematic inflammation can be measured using a variety of biochemical and haematological markers. One of these, neutrophil/lymphocyte ratio (NLR) could be an important measure of systematic inflammation as it is cost-effective, is readily available and can be calculated easily. In recent studies, the height of NLR is related to early mortality in PTE [3]. All leukocyte subtype are known to contribute in the development of atherosclerotic plaque and hence the presence of elevated neutrophils, platelets and low lymphocyte are associated with a risk of coronary artery disease (CAD) and are shown to be the predictor of mortality [4]. An elevated platelet/lymphocyte ratio (PLR) as a risk factor for arterial obstructive diseases has been evaluated in some studies. It has been shown that elevated PLR is a

significant independent predictor of long term mortality after non-ST elevation myocardial infraction [5].

Platelets are very important in atherothrombosis' pathogenesis. Normally, platelets are not only heterogeneous but also reactive in point of density and size. The average volume of platelet (MPV) can be measured in total blood count and is a platelet function indicator. The platelet reactivity and correlation of MPV are known. The reactivity of increased platelet causes increasing platelet's volume and decreasing bleeding's process. Big platelets are more active as metabolic and enzymatic. Because of this, they include thrombotic potential. In recent studies, it is identified that MPV increases in hypertensive crisis and carbon monoxide poisoning [6-8].

In our study, we also aim to search the prudence of MPV, NLR and PLR in pulmonary embolic's diagnosis.

Material and Method

Through the patients applying to our emergency room between 01 January 2014 and 01 January 2015, 42 patients over 18 diagnosed with pulmonary thromboembolic by taking spiral toraks tomography by scanning ICD-10 diagnosis codes on data base. 30 healthy people were taken to study for control group. The demographic datas, symptoms, treatment, conclusion of patients and the MPV, PLR and NLR values in total blood count of patients were recorded in picking data form. When the patients were taken to the hospital, the values of MPV, NLR and PLR in the first

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total blood count are valid. The patients who have a hematologic, inflammatory, serious kidney and liver disease, who take chemotherapy and treat immune suppressive weren't taken to the study.

The software package Statistical Package for the Social Sciences (SPSS) for Windows version 18.0 was used for statistical analysis. Continuous variables from the study groups were reported as mean + standard deviation and categorical variables as percentages. Comparing continuous variables, the Mann-Whitney U test was used where appropriate.

Results

The average age of 42 patients taken to study was $67,90 \pm 14,85$. 24 (%57,1) of patients were women and 18 (%42,9) of patients were men. 39 (%92,9) of patients were treated by hospitalizing but one patient (%2,4) was discharged and two patients (%4,8) were died. According to the complaints of patients, 36 patients (%85,7) have shortness of breathe, 1 patient (% 2,4) has chest pain, 1 patient (%2,4) has cough, 2 patients (%4,8) have hemoptysis and 2 patients have atypical complaints. When we evaluate the patients with their another diseases, 1 patient (%2,4) has hypertension, 1 patient (%2,4) has COPD, 3 patients (%7,1) have a cerebrovascular disease, 2 patients have malignancy. In the treatment of patients, heparin infusion was started to 20 patients (%47,6) but clexane treatment was started to 22 patients (% 52,4). In the first 24 hours, coumadin treatment was started to 47,6 of patients. The average D-dimer of patients was $5052,40 \pm 5839,95$, the average PLR of patients was $0,19 \pm 0,12$, the average NLR of patients was $8,07 \pm 6,00$ and the average MPV of patients was $9,95 \pm 1,01$. However in the control group, the average PLR was $0,18 \pm 0,19$, the average NLR was $4,34 \pm 4,26$ and the average MPV was $8,79 \pm 0,57$. The averages MPV, NLR and PLR of patients' group were higher than control group's. When comparing to the group of patient and control, NLR and MPV were significantly high ($p < 0.005$) but PLR weren't significantly high ($p = 0,141$) (Table 1)

Table 1. The averages MPV, NLR and PLR of patient and control groups

	Pulmonary Embolic	Control Group	P Value
MPV	$9,95 \pm 1,01$	$8,79 \pm 0,57$	0,00
NLR	$8,07 \pm 6,00$	$4,34 \pm 4,26$	0,00
PLR	$0,19 \pm 0,12$	$0,18 \pm 0,19$	0,141

Discussion

Pulmonary thromboembolic is a disease the diagnosis of which is hard and the mortality of treatment's process of which is high. The differences of sexes in phenomenon with PTE aren't often reported. In study, the average age of patients was $65,12 \pm 16,23$ and % 36,6 of patients were men, % 63,4 of patients were women [1]. In the study of Şen and friends, the average age of patients was $57,93 \pm 18,52$ years and % 63,9 of patients were women, % 36,4 of patients were men [9]. In the study of Güzel and friends, the average age of patients was $56,2 \pm 18,2$

years. % 60,6 of patients were women, %39,6 of patients were men [10]. In our study, our patients were women and overaged by conforming to the literature.

In this study, the patients who have % 81,3 shortness of breathe applied [1]. In the study of Şen and friends, shortness of breathe is the most common symptom with % 97,9 [9]. In the study of Güzel and friends, shortness of breathe is the most common complain with % 42,4. In our study, we also found that the most common complain is shortness of breathe by conforming to the literature.

In the study, heparin infusion was applicated %36,6, clexane was applicated to %59,8 and tPA was applicated to % 3,6. In the study of Ermiş and friends, heparin treatment was started to all patients, in the following process coumadin was added and tPA was applicated to % 14,1 of patients [11]. It was identified when commencing treatment of heparin and coumadin, there was no tPA used like in the literature in also our study. This can be explained that we can't reach old-dated information retrospectively and the files aren't filled enough in our electronic archive system.

In the study of Talay and friends, MPV in the group of PTE was significant higher than control group ($9,42 \pm 1,22 - 8,04 \pm 0,89$, $p < 0.0001$) [6]. In the study of Şen and friends, the average MPV of dead patients was significant high ($p = 0.01$) [9]. However in the study of Varol and friends, the average MPV in acute PTE group was higher than control group [11]. Also in our study the average MPV was higher than control group ($p < 0.005$).

In the study of Bozkuş and friends, the average NLR in the dead was significant higher than the alive ($p < 0.001$) [12]. In the study of Çelik and friends, NLR was significant high in the group of PLR, PTE ($p < 0.05$) but it wasn't found as a free predictor [13]. In the study of Kundi and friends, it was found that there was a relation between PLR and the risk of high mortality in PTE patients. Also, in our study NLR and PLR were high in the group of PTE embolic, when comparing to the control group, NLR was significant high but PLR wasn't.

There were some disabilities of our study. First of all it was a retrospective study. Adequate patients and information weren't scanned back dated. because there were lacks in the system of digital archiving and the files of patients and the notes of consultation weren't filled inward.

Conclusion

The number of study which is related to the relation between acute PTE and PLR, NLR is restricted in the literature. Also, in our study when comparing to the group of control and patient, NLR was significant high but PLR wasn't. It is really into the topic, it is necessary that NLR and PLR in PTE must be searched prospectively in terms of prognosis and mortality as a free predictor.

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