DOI: 10.5350/BTDMJB201410301

Experience in Pulmonary Embolus with Differences of Patients with a New Diagnosed in Emergency Department Versus The Other Outpatient Clinics

Betül Gülalp[1], Yasemin Çetinel[1], Murat Uğur[1], Hüseyin Narcı[1], Abdullah İbrahim[1], Özlem Karagün[1], Mehmet Ali Habeşoğlu[2]

[1]*Başkent Üniversitesi, Tıp Fakültesi, Acil Tıp Anabilim Dalı, Ankara*
[2]*Başkent Üniversitesi, Tıp Fakültesi, Göğüs Hastalıkları Anabilim Dalı, Ankara*

ÖZET

Polikliniklere karşın acil serviste yeni tanı alan pulmoner emboli hastalanın farklılıklarındaki deneyim

Amaç: Pulmoner emboli (PE) hastaları değişik semptomlarla değişik kliniklere başvururlar. Bu çalışmanın amacı bir üniversite hastanesinin değişik şehirlerdeki dört ayrı hastanesindeki değişik polikliniklere ve acil servise başvuran pulmoner emboli tanılı hastaların özelliklerini ve farklılıklarını ortaya koymaktır.

Gereç ve Yöntem: Acil serviste ve polkiniklerde son 20 ayda yeni pulmoner emboli tanısı almış hastaların dosyaları incelendi. Çalışma çok merkezli ve retrospektif olarak yapıldı. Hasta kartları değerlendirilerek iki çift kör araştırmacı tarafından daha önce hazırlanan formlar doldurulduu.

Bulgular: Toplam 152 hasta incelendi. Acil servisteki 65 yaş ve üstü hastaların oranı %47.7 idi (n: 51); kadın hastaların oranı %57 idi (n: 61). Hastaların 107'sine (%70) acil serviste, 45'i (%29.6) polikliniklerde tanı almıştı. Hastaların 12'si (%7.9) tanı almadan önceki son 10 gün içinde aynı acil servise birkaç kez benzer şikayetlerle başvurmuştu. Polikliniklerde tanı alan PE hastaları çoğunlukla obez (p: 0.016) ve başvurudan önce semptom süresi uzunken (p: 0.004) acil servise gelen hastalarda taşikardi (p: 0.017) ve yüksek beyaz küre sayısı (p: 0.001) mevcuttu. Akciğer grafisinde diafragma elevasyonu poliklinik hastalarında daha sık görüldü (p: 0.033).

Sonuç: Polikliniklerde tanı alan PE hastaları acil serviste tanı alanlara görer daha stabil, obez ve daha uzun süreli şikayetlere sahipti.

Anahtar kelimeler: Pulmoner emboli, acil servis, poliklinik

ABSTRACT

Experience in pulmonary embolus with differences of patients with a new diagnosed in emergency department versus the other outpatient clinics

Objective: The patients with pulmonary embolus apply to different clinics according to various symptoms. The aim of this study is to report the characteristics and differences of pulmonary embolism (PE) patients diagnosed due to the admittion to the emergency department (ED) versus the other outpatient clinics (OC) of four hospitals in different cities of a university.

Material and Methods: We reviewed the records of patients who had been newly diagnosed with pulmonary embolism in the ED and OC over a 20-months period. It was a retrospective multicenter study. The charts of patients were evaluated and fulfilled by two blind researchers on a form that was prestudy prepared.

Results: There were a total of 152 patients studied. The ratio of patients 65 years old and older was 47.7% (n: 51); 57% (n: 61) were female in ED. 107 (70%) patients were diagnosed in the ED and 45 patients (29.6%) were diagnosed in OC. Twelve (7.9%) patients visited the same ED with same complaint within ten days before the visit during which the diagnosis of PE was made. Those diagnosed with PE in the OC were more frequently obese (p: 0.016) and had longer duration of symptoms before arrival (p:0.004), while ED patients had tachycardia (p:0.017) and higher WBC levels (p: 0.001). On chest X-ray, elevation of the diaphragm was significantly more common in OC patients (p: 0.033).

Conclusion: PE patients diagnosed in OC were stabile, obese and had longer durations of complaints than those diagnosed in the ED.

Key words: Pulmonary Embolus, Emergency Department, Outpatient Clinics

Bakırköy Tıp Dergisi 2014;10:91-98

Yazışma adresi / *Address reprint requests to:* Betül Gülalp
Başkent Üniversitesi, Tıp Fakültesi, Acil Tıp Anabilim Dalı, Ankara

Elektronik posta adresi / *E-mail address:* docbetul@yahoo.com

Geliş tarihi / *Date of receipt:* 6 Şubat 2014 / February 6, 2014

Kabul tarihi / *Date of acceptance:* 6 Ağustos 2014 / August 6, 2014

INTRODUCTION

PE patients admit to different clinics with various complaints. The aim of this study is to compare and identify the differences between PE patients diagnosed in admittion in ED and other outpatient clinics (OC) including those initially possible misdiagnosed who presented to the same emergency departments. Misdiagnosis can be due to a variety of factors, including inadequate clinical skills, lack of specific laboratory or radiologic tests, or incorrect interpretation of test results (1-4). There have been no studies in Turkey surveying the characteristics of patients diagnosed with PE between in ED and OC.

MATERIAL AND METHODS

We examined the records of patients who had presented to any of our four university hospitals over a 20-month period between April 15, 2008 and February 1, 2010 and were given a new diagnosis of PE included with ICD code I26. There were emergency physicians, residents and practioner doctors in ED and physicians of working branch in OC. OC included all another outpatient clinics except ED. Patients diagnosed during hospitalization for any treatment of another disease (n: 12) or those with a recurrence or previous diagnosis of PE (n: 458) were excluded. Patients' records were evaluated for demographic information, history, chief complaint, comorbities, risk factors, clinical, laboratory, ECG, radiographic data, length of stay, and mortality, as well as the location of initial presentation. The first reviewer collected the data from the records; a second blinded reviewer then checked the data against the patient file. Also, revised Geneva and Wells risk score were calculated. The results of physical examinations were included the handwritten knowledge by the doctor in the patient file. With location of presentation considered the dependent variable, data were analyzed with Fisher's Exact and Mann-Whitney U testing using SPSS12 for Windows®.

RESULTS

Annually, there are a total of 150,000 visits to four EDs of our University. During the study period, 622 patients from the four University EDs had an ICD code of PE, of which 152 patients had a first diagnosis of PE. 107 (70%) patients were diagnosed in the ED and 45 patients (29.6%) were diagnosed in the OC. The mean age of these patients were 62.7±17 and 58.9±14 in ED and OC respectively (p: 0.14). There was not a significant difference between ED and OC in sex (p: 0.678) and female ratio was 57% (61) in ED, 62% (28) in OC.

Of the 152 PE patients, 12 (7.9%) attended to the emergency department had more than once visit within last ten days which the diagnosis of PE was made. Risk factors, chief complaints and first physical findings are compared in Table 1. The mean duration of the initial chief complaint of ED and OC patients was 7±15 and 12±20 (p: 0.004) days, respectively. Systolic tension arterial were 128±22, 129±22 (p: 0.77), diastolic tension arterial were 78±14, 79±75 (p: 0.842) in ED and OC. Decreased rate in oxygen saturation on pulse oxymetry than 95 were 65.4% (70), 51.1% (23) in ED and OC (p: 0.14). There was a total of 18 exitus (11.8%). WBC, platelet and hematocrit were 12±5 vs 9.6±4 k/mm^3, 287±122 vs 276±109 K/mm^3, and 37±6% in ED and OC patients, respectively (p: 0.001, 0.69, 0.95).

ECG findings are evaluated in Table 2. Table 3, Table 4 demonstrate the echocardiogram and the computed tomography angiography (CTA) results according to revised Geneva and Wells scores of patients. Five patients with normal computed tomography angiogram CTA had high probability of PE with ventilation-perfusion scintigraphy. On CXR, the prevalence of atelectasis was not significantly different (p: 0.710) between ED and OC patients, but elevation of the hemidiaphragm was more common in those with PE presented to the outpatient clinics (32.8% ED-57.6% OC) (p: 0.033). The length of hospital stay was 8.3±4.9 days among ED patients and 7.8±5 days among OC patients (p: 0.271).

DISCUSSION

Patients with pulmonary embolism may present with a wide variety of chief complaints, physical signs and findings. They apply to ED or any other outpatient clinics. There is not any extended comparison of first features of PE patients between ED and other OC in application. There was not a significant difference in age of ED and OC patients that they were 62.7±17, 58.9±14 years old (p: 0.14). The mean age was reported as 57 in ED and 65.8, 68 years (±) including all inpatient PE patients (5,6,7).

Female rates were 57%, 62% in ED versus OC (0.678).

Table 1: Comparison of risk factors, chief complaint, first physical findings of PE patients applied to ED and OC

Risk factors		**Applied to ED?**						
		Yes		**No**		**Total**		**X^2 test**
		n	**%**	**n**	**%**	**n**	**%**	**p**
Age ≥ 65 years	Yes	51	47.7	18	40.0	69	45.4	0.492
	No	56	52.3	27	60.0	83	54.6	
Malignancy	Yes	12	11.2	8	17.8	20	13.2	0.407
	No	95	88.8	37	82.2	132	86.8	
Obesity	Yes	4	3.7	7	15.6	11	7.2	0.016
	No	103	96.3	38	84.4	141	92.8	
Oral contraceptive use	Yes	1	0.9	2	4.4	3	2.0	0.209
	No	106	99.1	43	95.6	149	98.0	
Chemotherapy	Yes	5	4.7	3	6.7	8	5.3	0.695
	No	102	95.3	42	93.3	144	94.7	
Immobilization longer than three days	Yes	20	18.7	9	20.0	29	19.1	1
	No	87	81.3	36	80.0	123	80.9	
Surgical procedure within the prior month	Yes	26	24.3	14	31.1	40	26.3	0.504
	No	81	75.7	31	68.9	112	73.7	
Postpartum	Yes	4	3.7	0	0.0	4	2.6	0.319
	No	103	96.3	45	100.0	148	97.4	
Major trauma within one month	Yes	1	0.89	1	2.08	2	1.25	0.511
	No	111	99.11	47	97.92	158	98.75	
Stroke	Yes	7	6.5	1	2.2	8	5.3	0.437
	No	100	93.5	44	97.8	144	94.7	
Pregnancy	Yes	1	0.89	0	0,00	1	0.63	1
	No	111	99.11	48	100.00	159	99.38	
Symptoms		**Applied to ED?**						
		Yes		**No**		**Total**		**X^2 test**
		n	**%**	**n**	**%**	**n**	**%**	**p**
Dispne	Yes	84	78.5	33	73.3	117	77.0	0.631
	No	23	21.5	12	26.7	35	23.0	
Pleuritic pain	Yes	34	31.8	8	17.8	42	27.6	0.118
	No	73	68.2	37	82.2	110	72.4	
Flank pain	Yes	23	21.5	6	13.3	29	19.1	0.346
	No	84	78.5	39	86.7	123	80.9	
Coughing	Yes	38	35.5	13	28.9	51	33.6	0.547
	No	69	64.5	32	71.1	101	66.4	
Chest pain like angina	Yes	17	15.9	10	22.2	27	17.8	0.484
	No	90	84.1	35	77.8	125	82.2	
Hemoptysis	Yes	9	8.4	2	4.4	11	7.2	0.508
	No	98	91.6	43	95.6	141	92.8	
Diaphoresis	Yes	1	0.9	0	0.0	1	0.7	1
	No	106	99.1	45	100.0	151	99.3	
Physical findings		**Applied to ED?**						
		Yes		**No**		**Total**		**X^2 test**
		n	**%**	**n**	**%**	**n**	**%**	**p**
Tachycardia (	Yes	42	39.3	8	17.8	50	32.9	0.017
	No	65	60.7	37	82.2	102	67.1	
Tachypnea	Yes	30	28.0	4	8.9	34	22.4	0.018
	No	77	72.0	41	91.1	118	77.6	
Right heart failure findings	Yes	21	19.6	5	11.1	26	17.1	0.3
	No	86	80.4	40	88.9	126	82.9	
Unilateral leg swelling	Yes	19	17.8	13	28.9	32	21.1	0.187
	No	88	82.2	32	71.1	120	78.9	
Temperature of ≥38.5°C	Yes	24	22.4	11	24.4	35	23.0	0.954
	No	83	77.6	34	75.6	117	77.0	
Homans's sign	Yes	16	15.0	9	20.0	25	16.4	0.598
	No	91	85.0	36	80.0	127	83.6	
Cyanosis	Yes	3	2.8	0	0.0	3	2.0	0.555
	No	104	97.2	45	100.0	149	98.0	
Wheezing	Yes	9	8.4	0	0.0	9	5.9	0.058
	No	98	91.6	45	100.0	143	94.1	
S3	Yes	4	3.7	0	0.0	4	2.6	0.319
	No	103	96.3	45	100.0	148	97.4	
S4	Yes	2	1.9	1	2.2	3	2.0	1
	No	105	98.1	44	97.8	149	98.0	

Table 2: Electrocardiogram findings in PE patients

Risk factors		Applied to ED?						
		Yes		No		Total		X^2 test
		n	%	n	%	n	%	p
Sinus tachycardia	Yes	40	37.38	9	20.00	49	32.24	0.057
	No	67	62.62	36	80.00	103	67.76	
Sinus	Yes	47	43.93	27	60.00	74	48.68	0.103
	No	60	56.07	18	40.00	78	51.32	
Left axis	Yes	8	7.48	1	2.22	9	5.92	0.282
	No	99	92.52	44	97.78	143	94.08	
Left hemiblock	Yes	0	0.00	1	2.22	1	0.66	0.296
	No	107	100.00	44	97.78	151	99.34	
Right axis	Yes	3	2.80	1	2.22	4	2.63	1
	No	104	97.20	44	97.78	148	97.37	
Patologic Q	Yes	6	5.61	2	4.44	8	5.26	1
	No	101	94.39	43	95.56	144	94.74	
Atrial Fibrillation	Yes	9	8.41	2	4.44	11	7.24	0.508
	No	98	91.59	43	95.56	141	92.76	
Wellen's	Yes	1	0.93	0	0.00	1	0.66	1
	No	106	99.07	45	100.00	151	99.34	
Left ventricle hypertrophy	Yes	0.93	3	6.67	4	2.63	97.5	0.078
	No	99.07	42	93.33	148	97.37	97.5	
Pointed T	Yes	2	1.87	0	0.00	2	1.32	1
	No	105	98.13	45	100.00	150	98.68	
Negative T	Yes	5	4.67	5	11.11	10	6.58	0.162
	No	102	95.33	40	88.89	142	93.42	
Right hemiblock	Yes	5	4.67	3	6.67	8	5.26	0.695
	No	102	95.33	42	93.33	144	94.74	
Q3	Yes	1	0.93	1	2.22	2	1.32	0.506
	No	106	99.07	44	97.78	150	98.68	
T3	Yes	0	0.00	1	2.22	1	0.66	0.296
	No	107	100.00	44	97.78	151	99.34	
Fascicular block	Yes	0	0.00	1	2.22	1	0.66	0.296
	No	107	100.00	44	97.78	151	99.34	
High ventricle rate atrial fibrillation	Yes	3	2.80	1	2.22	4	2.63	1
	No	104	97.20	44	97.78	148	97.37	
ST elevation	Yes	1	0.93	1	2.22	2	1.32	0.506
	No	106	99.07	44	97.78	150	98.68	
Supraventricular tachycardia	Yes	1	0.93	0	0.00	1	0.66	1
	No	106	99.07	45	100.00	151	99.34	
Extrasystole	Yes	1	0.93	1	2.22	2	1.32	0.506
	No	106	99.07	44	97.78	150	98.68	
Right branch block	Yes	3	2.80	0	0.00	3	1.97	0.555
	No	104	97.20	45	100.00	149	98.03	
Left branch block	Yes	3	2.80	0	0.00	3	1.97	0.555

There were 53% female in ED, 54% and 53% in all inpatients (5,6,7).

The chief symptoms were dyspnea (78.5% and 73.3%), coughing (35.5%-28.9%), pleuritic pain (31.8%-17.8%), and flank pain (21.5%-13.3%), respectively, while chest pain was only in 15.9% and 22.2% of patients in ED and OC, compatible with literature, however there were not any difference between symptoms all studied. Dyspnea at rest 50.1%, pleuritic chest pain 39.4%, coughing without hemoptysis 22.9%, substernal chest pain 15.2% were presented in ED (5). In another study, dyspnea was the only presenting symptom in 29% of patients (6). Sanchez et al. also found dyspnea in 80%, pleuritic chest pain in 52% similar to another report within dyspnea was 82%, chest pain was 49% (7,8).

The top risk factors were being 65 and older years, having surgical procedure within the prior month and immobilization longer than three days in ED and OC (47.7%-40%, 24.3%-31.1%, 18.7%-20%, respectively), besides obesity was the only significant risk factor in OC (p=0.016). Obesity 26.9%, recent hospitalization 23.8%, malignancy 22.3%, recent surgery 14%, immobility 11.6%, current DVT 9.5% were found in PE patients in ED (5). Cancer was the most common risk factor in 27% in all PE patients (6). Prolonged immobilization, history of thrombophlebitis, and bone fractures of the lower extremities were the most risks reported (9). In another study, risk factors were mentioned as a body mass index

Table 3: The results in echocardiography according to Revised Geneva and Wells scores of the patients.

		Applied to ED?					
		Yes		No		Total	
		n	%	n	%	n	%
Normal							
Revisedgeneva	Low	5	21.7	2	33.3	7	24.1
	Medium	17	73.9	3	50.0	20	69.0
	High	1	4.3	1	16.7	2	6.9
	Total	23	100.0	6	100.0	29	100.0
Wells	Low	14	60.9	3	50.0	17	58.6
	Medium	8	34.8	2	33.3	10	34.5
	High	1	4.3	1	16.7	2	6.9
	Total	23	100.0	6	100.0	29	100.0
Left ventricle hypertrophy							
Revised Geneva	Low	2	11.1	4	44.4	6	22.2
	Medium	15	83.3	5	55.6	20	74.1
	High	1	5.6	0	0.0	1	3.7
	Total	18	100.0	9	100.0	27	100.0
Wells	Low	14	77.8	8	88.9	22	81.5
	Medium	2	11.1	1	11.1	3	11.1
	High	2	11.1	0	0.0	2	7.4
	Total	18	100.0	9	100.0	27	100.0
Pulmonary Hypertension							
Revised Geneva	Low	6	22.2	6	35.3	12	27.3
	Medium	17	63.0	11	64.7	28	63.6
	High	4	14.8	0	0.0	4	9.1
	Total	27	100.0	17	100.0	44	100.0
Wells	Düşük	15	55.6	12	70.6	27	61.4
	Orta	4	14.8	1	5.9	5	11.4
	Yüksek	8	29.6	4	23.5	12	27.3
	Toplam	27	100.0	17	100.0	44	100.0
Right Ventricle Dilatation							
Revised Geneva	Low	10	33.3	6	54.5	16	39.0
	Medium	19	63.3	5	45.5	24	58.5
	High	1	3.3	0	0.0	1	2.4
	Total	30	100.0	11	100.0	41	100.0
Wells	Low	20	66.7	9	81.8	29	70.7
	Medium	5	16.7	1	9.1	6	14.6
	High	5	16.7	1	9.1	6	14.6
	Total	30	100.0	11	100.0	41	100.0
Left Ventricle Diastolic Disfunction							
Revised Geneva	Low	1	14.3	0	0.0	1	11.1
	Medium	5	71.4	1	50.0	6	66.7
	High	1	14.3	1	50.0	2	22.2
	Total	7	100.0	2	100.0	9	100.0
Wells	Low	2	28.6	0	0.0	2	22.2
	Medium	3	42.9	0	0.0	3	33.3
	High	2	28.6	2	100.0	4	44.4
	Total	7	100.0	2	100.0	9	100.0

of >29 kg/m2 (29%), major surgery within 2 months (29%), bed rest for ≥5 days (28%), prior venous thromboembolism (25%), cancer (23%), current central venous catheter (8%) and hypercoagulable state (5%) (10).

Tachypnea, hypoxia, tachycardia, and signs of DVT were present in 39%, 35%, 33%, and 29%, respectively inpatient and ED (6). Tachypnea in 70%, tachycardia in 26%, and signs of deep venous thrombosis in 7% were identified in admitted PE patients to hospital (7). The 89% of patients had symptoms of pulmonary embolism were hemodynamically stable, 4% were unstable while 7% were asymptomatic (10). The most physical findings were tachycardia, tachypnea, right heart failure findings and fever (39.3%-17.8%, 28%-8.9%, 19.6%-11.1%, 22.4%-24.4%, respectively) in ED and OC, however only tachycardia and tachypnea were the factors to attend to the ED (0.017, 0.018)

Platelet activation ascends with venous thrombus formation, initially. Thrombocytopenia is associated wih the severity of PE (11,12). Besides, thrombocytosis is a risk for PE in emergency intensive care admit (13). The platelet, WBC and HTC counts in our patients were within

Table 4: Computerised tomography results according to Revised Geneva and Wells scores of the patients.

		Applied to ED?					
		Yes		No		Total	
		n	%	n	%	n	%
Bilateral Spread PE							
Revised Geneva	Low	7	20.0	4	25.0	11	21.6
	Medium	27	77.1	10	62.5	37	72.5
	High	1	2.9	2	12.5	3	5.9
	Total	35	100.0	16	100.0	51	100.0
Wells	Low	29	82.9	11	68.8	40	78.4
	Medium	4	11.4	1	6.3	5	9.8
	High	2	5.7	4	25.0	6	11.8
	Total	35	100.0	16	100.0	51	100.0
One Sided Spread PE							
Revised Geneva	Low	2	22.2	2	40	4	28.6
	Medium	4	44.4	2	40	6	42.9
	High	3	33.3	1	20	4	28.6
	Total	9	100.0	5	100	14	100.0
Wells	Low	2	22.2	3	60	5	35.7
	Medium	3	33.3	1	20	4	28.6
	High	4	44.4	1	20	5	35.7
	Total	9	100.0	5	100	14	100.0
Bilateral Segmentary PE							
Revised Geneva	Low	4	20.0	2	50.0	6	25.0
	Medium	15	75.0	2	50.0	17	70.8
	High	1	5.0	0	0.0	1	4.2
	Total	20	100.0	4	100.0	24	100.0
Wells	Low	13	65.0	3	75.0	16	66.7
	Medium	3	15.0	0	0.0	3	12.5
	High	4	20.0	1	25.0	5	20.8
	Total	20	100.0	4	100.0	24	100.0
One Sided Segmentary PE							
Revised Geneva	Low	0	0.0	0	0.0	0	0.0
	Medium	4	26.7	3	37.5	7	30.4
	High	11	73.3	5	62.5	16	69.6
	Total	15	100.0	8	100	23	100.0
Wells	Low	9	60.0	6	75	15	65.2
	Medium	6	40.0	1	12.5	7	30.4
	High	0	0.0	1	12.5	1	4.3
	Total	15	100.0	8	100	23	100.0
Bilateral Subsegmentary Periferal PE							
Revised Geneva	Low	2	22.2	0	0	2	18.2
	Medium	6	66.7	2	100	8	72.7
	High	1	11.1	0	0	1	9.1
	Total	9	100.0	2	100	11	100.0
Wells	Low	4	44.4	0	0	4	36.4
	Medium	4	44.4	0	0	4	36.4
	High	1	11.1	2	100	3	27.3
	Total	9	100.0	2	100	11	100.0
One Sided Subsegmentary Periferal PE							
Revised Geneva	Low	4	28.6	1	16.7	5	25.0
	Medium	10	71.4	4	66.7	14	70.0
	High	0	0.0	1	16.7	1	5.0
	Total	14	100.0	6	100.0	20	100.0
Wells	Low	8	57.1	2	33.3	10	50.0
	Medium	3	21.4	2	33.3	5	25.0
	High	3	21.4	2	33.3	5	25.0
	Total	14	100.0	6	100.0	20	100.0
Massive PE							
Revised Geneva	Low	1	33.3	1	100.0	2	50.0
	Medium	2	66.7	0	0.0	2	50.0
	High	0	0.0	0	0.0	0	0.0
	Total	3	100.0	1	100.0	4	100.0
Wells	Low	1	33.3	1	100.0	2	50.0
	Medium	1	33.3	0	0.0	1	25.0
	High	1	33.3	0	0.0	1	25.0
	Total	3	100.0	1	100.0	4	100.0

normal limits, while WBC was lower in OC (p: 0.001). A modest leukocytosis may be associated with PE (14). WBC denotes hypercoagulability according to the relation with fibrinogen, factor VII, and factor VIII (14,15).

The commonest abnormalities on chest radiography were cardiac enlargement (36%), effusion (30%), elevated hemidiaphragm (26%), pulmonary artery enlargement (25%), atelectasis (24%), and infiltration (23%) (8). Elevated hemidiaphragma was 2.5%, atelectasis was 16.9 % in a report (5). The higher incidence of elevated hemidiaphragma on CXR in OC patients (32.8% ED-57.6% OC) may be related with the longer duration of the disease process in this patient group; there is no published report showing this difference (p: 0.033). In a study used the clinical probability for PE in ED, there was found 51.4% elevated hemidiaghragm, 39.6% band atelectectasis in PE patients (16).

ECG interpretation revealed normal sinus rhythm in 53%, sinus tachycardia in 31%, S1Q3T3 pattern in 6%, and atrial fibrillation (AF) in 6% (6). Rodger et al. found tachycardia in 42.2%, atrial fibrillation in 4.4%, complete RBBB in 4.4%, S1Q3T3 in 11.6%, and S1S2S3 in 2.3% of cases with suspected PE (17). Geibel found sinus tachycardia in 67%, complete RBBB in 14%, incomplete RBBB in 19%, T-wave inversion in leads V2-4 in 50%, T-wave inversion in leads V4-V6 in 34% V4-V6 on initial presentation (18). Atrial fibrillation was found 8.41% (n: 9), 4.44 (n: 2), high ventricle rate atrial fibrillation was found 2.80% (n: 3), 2.22% (n=1) in ED versus OC. The ratios of right hemiblock were 4.67% (n: 5) and 6.67% (n: 3), while the ratios of right branch block were 2.8% (n: 3) and 0% in ED and OC.

Echocardiography is also helpful in the evaluation of critical patients with suspected PE, but findings of right ventricular overload may be absent in submassive PE (1). A ratio of RV/LV in parasternal long axis 0.9 was a risk factor for an adverse event in 30 days (7). 25% of PE patients in the report by Chunilal et al had RV dilatation on echocardiography (19). The patients had right ventricle dilatation evaluated according to the risk scores, it was 33.3% (n: 10) in ED, 54.5% (n: 6) in OC in low risk group of Revised Geneva score, while 66.7% (n: 20) in ED and 81.8% (n: 9) in OC in Wells score.

Hall found PE in 9% of ED patients undergoing CTA for suspected PE (20). In a study, PE was determined to be located in main pulmonary artery (32%), lobar artery (39%), segmental artery (25%), multi-subsegmental arteries (4%) (7). Massive PE in CTPA was found 33.3% (n: 1) in ED and 100% (n: 1) in OC in low risk groups of Revised Geneva and Wells scores. This was an unexpected result explained the patients with low risk score could have massive PE.

Adverse events within one month of PE diagnosis occur in almost 10% of patients, most commonly in those with altered mental status, shock, cancer and/or dilated right ventricle on echocardiography (7). Short-term mortality is a serious risk and has been reported to be 3.3% in all inpatients, 13.8% in unstable PE (21). The in-hospital mortality rate in our patients was 8.1%. Jelinek reported an in-hospital mortality rate of PE patients diagnosed in the ED to be 5.6% (2).

Twelve (7.9%) of our patients were missed on first presentation to our hospital system. This may be due to confusion of symptoms with those of other comorbid diseases. The various possibilities of diagnoses other than PE in older patients may lead to the misdiagnosis. Another study reported a rate of misdiagnosis of PE on initial presentation of almost 40%, with initial diagnoses of pneumonia in 7.1% and other throat-related and chest etiologies in 6.5% in the ED (2).

Consequently, PE patients in OC were more often stable, obese, had a longer period of initial chief complaint, and had a low WBC compared to the ED patients. Patients diagnosed in ED also had higher prevalences of tachycardia and tachypnea. The higher incidence of elevated hemidiaphragm in patients of outpatient clinics may be related to the longer duration of the disease process in this patient group. Duration of hospital stay and mortality were not different between the two groups of patients. PE patients with milder symptoms and signs, tended to be examined in the outpatient clinics rather than presenting to the emergency department.

Limitations: This was a retrospective study dependent on written data in charts. Additionally, there is no data on the rate of misdiagnosis of PE in OC.

KAYNAKLAR

1. Stein PD, Woodard PK, Weg JG, et al. Diagnostic pathways in acute pulmonary embolism: recommendations of the PIOPED II investigators. Am J Med. 2006;119:1048-1055.

2. Jelinek GA, Ingarfield SL, Mountain D, Gibson NP, Jacobs IG. Emergency Department diagnosis of pulmonary embolism is associated with significantly reduced mortality: a linked data population study. Emerg Med Australas. 2009; 21: 269-276.

3. Calisir C, Yavas US, Ozkan IR, Alatas F, Cevik A, Ergun N, Sahin F. Performance of the Wells and Revised Geneva scores for predicting pulmonary embolism. Eur J Emerg Med 2009; 16: 49-52.

4. Kasper W, Meinertz T, Just H. Diagnosis of cardiovascular diseases using suprasternal M-mode echocardiography. Klin Wochenschr 1985; 63: 193-204.

5. Pollack CV, Schreiber D, Goldhaber SZ, et al. J Am Coll Cardiol 2011; 57: 700-706.

6. Bajaj N, Bozarth AL, Guillot J, Kojokittah J, Appalaneni SR, Cestero C, Amankona RK, Pippim JA. Clinical features in patients with pulmonary embolism at a community hospital: analysis of 4 years of data. J Thromb Thrombolysis 2014; 37: 287-292.

7. Sanchez O, Trinquart L, Caille V, et al. Prognostic factors for pulmonary embolism: the prep study, a prospective multicenter cohort study. Am J Respir Crit Care Med 2010; 181: 168-173.

8. Goldhaber SZ, Visani L, De Rosa M. Acute pulmonary embolism: clinical outcomes in the International Cooperative Pulmonary Embolism Registry (ICOPER). Lancet 1999; 353: 1386-1389.

9. Miniati M, Prediletto R, Formichi B, et al. Accuracy of clinical assessment in the diagnosis of pulmonary embolism. Am J Respir Crit Care Med 1999; 159: 864-871.

10. Elliott CG, Goldhaber SZ, Visani L, DeRosa M. Chest radiographs in acute pulmonary embolism. Results from the International Cooperative Pulmonary Embolism Registry. Chest 2000; 118: 33-38.

11. Hsu JT, Chu CM, Chang ST, et al. Prognostic value of arterial/alveolar oxygen tension ratio (a/APO2) in acute pulmonary embolism. Circ J 2007; 71: 1560-1566.

12. Varol E, Icli A, Uysal BA, Ozaydin M. Platelet indices in patients with acute pulmonary embolism. Scand J Clin Lab Invest 2011; 71: 163-167.

13. Ho KM, Chavan S. Prevalence of thrombocytosis in critically ill patients and its association with symptomatic acute pulmonary embolism. A multicentre registry study. Thromb Haemost 2013; 109: 272-279.

14. Afzal A, Noor HA, Gill SA, Brawner C, Stein PD. Leukocytosis in acute pulmonary embolism. Chest. 1999; 115: 1329-1332.

15. Bovill EG, Bild DE, Heiss G, et al. White blood cell counts in persons aged 65 years or more from the Cardiovascular Health Study. Correlations with baseline clinical and demographic characteristics. Am J Epidemiol 1996; 143: 1107-1115.

16. Perrier A, Roy PM, Aujesky D, et al. Diagnosing pulmonary embolism in outpatients with clinical assessment, D-dimer measurement, venous ultrasound, and helical computed tomography: a multicenter management study. Am J Med 2004; 116: 291-299.

17. Rodger M, Makropoulos D, Turek M, et al. Diagnostic value of the electrocardiogram in suspected pulmonary embolism. Am J Cardiol 2000; 86: 807-809.

18. Geibel A, Zehender M, Kasper W, Olschewski M, Klima C, Konstantinides SV. Prognostic value of the ECG on admission in patients with acute major pulmonary embolism. Eur Respir J 2005; 25: 843-848.

19. Chunilal SD, Eikelboom JW, Attia J, et al. Does this patient have pulmonary embolism? JAMA 2003; 290: 2849-2858.

20. Hall WB, Truitt SG, Scheunemann LP, et al. The prevalence of clinically relevant incidental findings on chest computed tomographic angiograms ordered to diagnose pulmonary embolism. Arch Intern Med 2009; 169: 1961-1965.

21. Lin BW, Schreiber DH, Liu G, Briese B, et al. Therapy and outcomes in massive pulmonary embolism from the Emergency Medicine Pulmonary Embolism in the Real World Registry. Am J Emerg Med 2012; 30: 1774-1881.