Evaluation Of Risk Factors In Patients Diagnosed With Pulmonary Embolism By CT Angiography At Dubai Hospital Emergency

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KEYWORDS

Pulmonary embolism, Deep vein thrombosis, Emergency department

ABSTRACT

Background: This study presents a statistical analysis of the risk factors associated with confirmed cases of pulmonary embolism (PE) at the emergency department of Dubai Hospital. The objective is to identify the riskiest patients. Methodology: This is a retrospective analytical study of all patients who presented to the emergency department of Dubai Hospital between January 1, 2018, and June 30, 2020, and were diagnosed with acute pulmonary embolism, confirmed by CT pulmonary angiogram. Results: Obesity was identified in 42.5% of cases, while travelers accounted for 27.7% of pulmonary embolism cases. Other risk factors accounted for 8.5%. Discussion: Venous thromboembolism (VTE) risk was highest among patients hospitalized after surgery, with a nearly 22-fold increased risk. Patients with neurological diseases and extremity paralysis had a threefold increased risk. For travelers, there is an association between long-distance air travel and VTE, even among individuals at low to moderate risk. Further research is needed to explore traditional risk factors and prophylactic measures in air travel-related VTE. Conclusion: Obesity and referral from the airport medical center were the most prominent risk factors for pulmonary embolism in the Dubai Hospital emergency department.

1. Introduction

The correlation between pulmonary embolism and air traveling has been extensively evaluated in many studies, such as the Charles de Gaulle Airport review [4] and Madrid-Barajas Airport retospective review[3]. Most of the studies have shown a little or controversial correlation between travel and pulmonary embolism. Literature review have shown an association between long-haul flights and VTE but the incidence incresing by the increase of other VTE risk factors [6].

The difference in this review, is that it is an assessment of referrals, from a busy airport (Airport medical center and maktoom airport) to the emergency department in dubai hospital, of being a risk factor for pulmonary embolism.

Objectives And Aims

Aim:

Coming up with a conclusion either consolidates the well-known criteria or imposing some modifications by adding risk factors or enhancing some risk factors as more significant than others in our emergency department specifically focusing on the patient referred from Dubai and Maktoum airport, as Dubai is a main transit area between continents.

Following analysis of data aiming at coming with conclusion to Dubai health emergency facility on riskier patients to have acute pulmonary embolism

2. Methodology

Overview:

A retrospective analytical study on Salama electronic file about the risk factors distribution and correlation on patients diagnose with pulmonary embolism by CT pulmonary angiography at Dubai hospital emergency.

Research Question:

What are the risk factors of pulmonary embolism for each patient diagnosed in Dubai hospital emergency?

What are the most incident risk factors in our emergency?

Is the referral from Airport medical center at the top of the list?

Is it compatible with the worldwide incidence and distribution of risk factors (any variation in the risk factors distribution in our area)?

Hypotheses:

Statistical analysis for risk factors for the confirmed cases of pulmonary embolism in Dubai hospital emergency and coming to a conclusion of the riskier patient, and comparing it with the classical well-known criteria in use to assess the patient with suspected pulmonary embolism (wells criteria ……etc.).

Population and Study Sample: all patients presented to the emergency department of Dubai Hospital during the period 1/1/2018 till 30/6/2020 and were diagnosed to have acute pulmonary embolism confirmed by CT pulmonary angiogram.

Sample Size and Selection of Sample:

Having an episode in the emergency department of Dubai Hospital.

Age > 18 years, both genders.

A provisional diagnosis of acute pulmonary embolism confirmed by CT pulmonary angiogram.

Sources of Data: SALAM system – The electronic medical record of DHA (Dubai Health Authority)

Collection of Data: As per DHA rules and regulations via SALAMA system

Data Management: Confidential

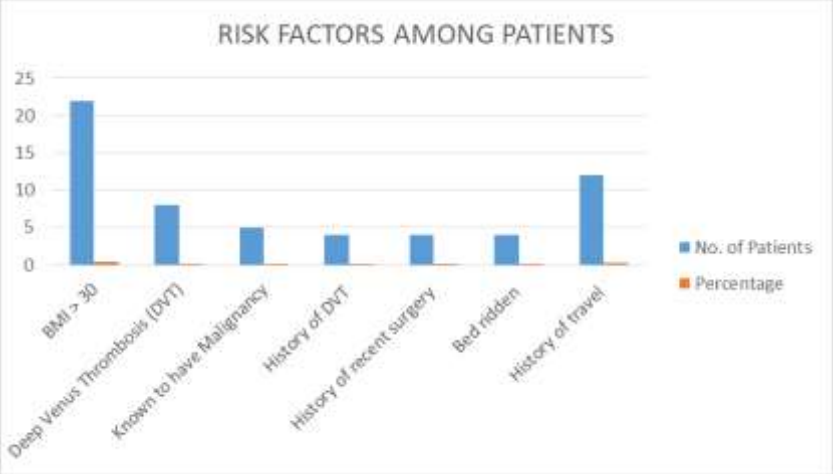
Data Analysis Strategies: The statistician of the Dubai Hospital quality office will analyze the data.

Time frame: 1/10/2019 – 1/11/2020

3. Result and Discussion

A threats Statistical analysis

In our study, we have 47 patients who have been confirmed to have pulmonary embolism by CT angiography in Dubai hospital emergency within the time range mentioned before. Statistical analysis of this group of patients shows 24 patients (51.1%) are females and 23 patients (48.9%) are males. 30 patients (63.8%) had T3 urgent acuity 16 patients (34.0%) were T2 acuity (emergency) and 1 patient (2.1%) was T1 acuity (resuscitation). 8 patients (17%) were confirmed to have deep Venus thrombosis (DVT) 4 of them (8.5%) were known to have a history of DVT. 4 patients (8.5%) have had a history of recent surgery. 4 patients (8.5%) were bedridden. 22 patients (42.5%) have a body mass index (BMI) higher than 30. 5 patients (10.6%) were known to have malignancy were distributed among 21 nationalities showing no specific affinity towards any ethnicity and 13 patients (27.7%) have a history of recent travel 12 of them (25.5%) were just referred from airport medical center after becoming symptomatic during the flight or right after patients arrival.



Risk Factor	No. of Patients	Percentage
BMI > 30	22	47%
Deep Venus Thrombosis (DVT)	8	17%
Known to have Malignancy	5	11%
History of DVT	4	9%
History of recent surgery	4	9%
Bedridden	4	9%
History of travel	12	26%

Discussion:

The VTE risk was highest among patients who were hospitalized with previous surgery, with nearly a 22-fold increased risk. This risk is much higher than previously reported,

Clinical trial data support the high risk of VTE associated with surgery. Recent trauma was the next most potent risk for VTE. With nearly a 13-fold increase in risk.

A 4-fold increased risk of VTE among patients with malignant neoplasm alone.

Patients with cancer receiving immunosuppressive or cytotoxic chemotherapy were at an even higher risk for VTE.

Patients with neurologic disease and extremity paresis or plegia had a 3-fold increased risk for VTE that was independent of hospital confinement.

Neither BMI nor current or past tobacco smoking was an independent risk factor for VTE. While previous studies reported increased risk caused by obesity.

Among women, pregnancy, postpartum period, oral contraceptive use, hormone therapy, and tamoxifen therapy were not independent risk factors for VTE. While several cohort studies showed no significant increase in VTE incidence among pregnant women compared with the general population, the incidence during the postpartum period increased about 2-fold. In addition, the vast majority of evidence suggests that both oral contraceptive use and hormone replacement therapy are significant risk factors for VTE [1].

In travellers there is an association between multiple long-distance air flights and venous thromboembolism, even in individuals at low to moderate risk. The role of traditional risk factors and

prophylactic measures in air travel-related venous thromboembolism needs further investigation [2].

Obesity is a risk factor for venous thromboembolic disease in men as well as women, [5] and from our analysis, it was the most prominent risk factor in our pool, with 42.5% of patients with a BMI more than 30.

As well, we noticed that the second most important factor for pulmonary embolism in Dubai hospital emergency was the referral from the airport medical center (25.5%)

The risk of pulmonary embolism in traveler has been assessed extensively in many trials but in our study, we assess being a traveler as a risk factor for pulmonary embolism in case of visiting or transferring to our emergency even though traveling is a risk factor for pulmonary embolism or not. As we know from the study of Air Travel–Related Pulmonary Embolism at the Madrid-Barajas Airport, Air travel is a risk factor for PTE, and the incidence of PTE increases with the duration of the air travel. However, the low incidence of PTE among long-distance passengers, similar to that observed in other international airports, does not justify social alarm. [3]

Another study from Charles de Gaulle airport a total number of 135.29 million passengers from 145 countries or other areas arrived during the period of the study, of whom 56 had confirmed pulmonary embolism. A relation between the duration of air travel and the risk of pulmonary embolism is strongly suggested by this study. The incidence of pulmonary embolism was markedly higher among passengers who traveled by air for more than 5000 km or spent approximately six hours or more in flight; these results thus demonstrate that a longer distance traveled is a significant risk factor for pulmonary embolism [4].

In our emergency 17-40% of patients diagnosed with acute pulmonary embolism referred from the Airport Medical Center, which is quite significant for our practice in the Dubai health authority emergency facility.

Moreover, the distribution of patients between males and female was almost equal, and history of deep venous thrombosis, recent surgery and bed redden got the same percentage of our emergency visitors.

4. Conclusion and future scope

Obesity and then a referral from the airport medical center were the most incident risk factors for the established case of pulmonary embolism in Dubai hospital emergency followed by equal distribution in the other risk factors, which includes bedridden, recent surgery, and history of deep Venus thrombosis.

The investigator's opinion that this local variation with superiority of obesity and referred case from Airport Medical Center is probably related to the high incidence of obesity in the community and the large number of travelers specifically transit in Dubai.

The investigator expects that similar superiority regarding referral from airports is there, in the same similar situation in the countries where there is a busy transit airport. Regardless of how much traveling itself is an important risk factor or no.

Recommendation: our staff in the Dubai health authority emergency facility should give more consideration to the cases of obesity and patients referred from the airport medical center (traveler) during work up of pulmonary embolism.

Statements

Thanks to the quality department in Dubai Hospital.

Statement of Ethics

Dubai scientific research Ethics Committee approval number: DSREC-10/2019_16

Conflict of Interest Statement

No conflict of interest.

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Author Contributions:

Dr Fadi mohammad mobarrak contribution: study design, statistical analysis, manuscript, and submission.

Dr. Mahmood Ghanaim contribution: study design and administrative support

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