Transcript Details

This is a transcript of a continuing medical education (CME) activity. Additional media formats for the activity and full activity details (including sponsor and supporter, disclosures, and instructions for claiming credit) are available by visiting:
https://reachmd.com/programs/cme/cteph-cted-current-epidemiology-and-trends/16507/

Released: 11/30/2023
Valid until: 11/30/2024
Time needed to complete: 4h 49m

ReachMD
www.reachmd.com
info@reachmd.com
(866) 423-7849

CTEPH & CTED -Current Epidemiology and Trends

Announcer:
Welcome to CME on ReachMD. This episode is part of our MinuteCE curriculum.

Prior to beginning the activity, please be sure to review the faculty and commercial support disclosure statements as well as the learning objectives.

Dr. Mylvaganam:
Alright. Hey, everyone. I'm Ruben, I'm one of the pulmonary hypertension physicians working alongside Mike and our team here with Yasmin and Dan. Figured I'd start first with an executive summary, just give you all the answers, and then we'll go into why this is a hard topic to really pin down and what some of the data are in terms of getting to this summary here. So I was tasked with discussing the epidemiology and the incidence of both CTEPH and CTED, or chronic thromboembolic disease.

So as for most rare diseases, the data on this is pretty scarce. CTEPH occurs with an estimated incidence of about 3 to 30 cases per million, which results in about 0.1 to 8.8% rate within 3 years after an acute PE, and I'll talk about where those numbers come from. However, we know that somewhere around 25%, and in some studies up to 60% of patients who ultimately get diagnosis CTEPH, they do not have that prior history of a thromboembolic event. So, it's hard to really define this population. CTED, so that disease of having chronic thromboembolic disease without the true elevation in pulmonary arterial pressure is roughly about 10 to 15% of patients after an acute PE, which roughly translates to about 30 to 45,000 patients per year in the U.S.

So why is this topic difficult to understand? Some of the limitations to understanding the incidence and epidemiology of CTEPH and CTED is that estimates are usually based on the prevalence of referrals to PH specialty centers, which was a biased population. It depends on small registries who follow patients prospectively after an acute PE. And there's an invariable use in both these registries in these trials that using either echocardiography or diagnostic catheterization to diagnose whether it's CTEPH or CTED. The estimates vary because there are differences in referral patterns. And I'll highlight some of those studies. Those differences in screening strategies after acute PE so after patients are diagnosed with acute PE, and there's difficulties inherent in the confirmation of the diagnosis, the CTEPH. You know, usually mandating multidisciplinary teams to try and come down to that diagnosis.

So just to highlight some of the differences in referral patterns, Victor taps in, in his group, showed the study back in goes 2016, where they used a managed care claims database, and they showed that 87% of patients had symptoms of PH after an acute PE, but only 61% of them underwent any type of imaging to evaluate those complaints. Locally, we here demonstrated that over about a 3.5-year period, which roughly equates to about 2,500 patients with PE in the Northwestern system, we demonstrated that 12% of those patients who were at risk, only 12% of those patients who were at risk were referred. And that distance from our CTEPH center was one of the big differences among those who were referred at risk and those who are not referred who were at risk.

So how we get to the incidence in epidemiology of CTEPH. Start, first with the incidence and epidemiology of acute PE. So from an acute PE perspective, this incidence ranges from 104 to 183 per 100,000 person years. We know that the incidence of an acute PE has been increasing, especially over the 2001 to 2009 period. So in that bottom graph there, on the right of your screen, you can see that the incidents stayed pretty much stable up until about 2001. And then after 2001, the incidents started to increase and we attribute that

increase just due to our improvements in the diagnostic imaging of patients with symptoms or suspicion for acute PE.

Our group, Dr. Cuttica, Dr. Karlyn Martin, and colleagues demonstrated that although this incidence is increasing, prior to 2008, the actual mortality of acute PE was actually on its downward trend, it was a -4.4% adjusted mortality. But over the period of 2008 to 2018, that adjusted mortality actually started to increase to about a +0.6%. And there were also racial and gender disparities that were highlighted in this nationwide dataset that they looked at.

The issue with chronic thromboembolic disease is it's also very hard to diagnose. So in a pretty decent study that used high-probability V/Q scans defining chronic disease as having at least two perfusion defects, 29% of patients with an acute PE have residual perfusion defects at 6 months. Those patients who have those residual perfusion defects are more likely to have dyspnea. They're more likely to have higher echo-derived systolic PAP pressures and a lower 6-minute walk. And they found certain risk factors for that persistent perfusion defect, age time between the symptom onset and diagnosis, and a degree of obstruction at the time of an acute PE. We know that the recognition of an existence of this post PE syndrome, or CTED, it further complicates our calculated incidents and estimates of CTEPH.

So how likely is CTEPH after a PE? There's been many studies that have looked at this. This is the meta-analysis that combined many of these studies. And you can see here on the screen that 16 studies with about 4,000 patients in all comers at the top of the screen there, the incidence of CTEPH after an acute PE in all comers is about 0.6%, 0.566%. And survivors of acute PE that increases to about 3.2%. And then survivors without major comorbidities, that incidence is about 2.8%.

What complicates this is that PEs are not all clinically diagnosed. So we know that you can have silent PEs after DVTs. This comes from some of our surgical data, where they looked at patients who had evidence of a DVT and have shown that anywhere from 18 to 52% of patients had evidence of the PE after DVT. And it was clinically silent in anywhere from 18 to 75% of those patients. A systematic review of distal DVT, so distal to the popliteal, demonstrated that there is a pooled prevalence of silent PE of about 13.1%. So, a pretty significant number of patients who have DVTs have silent PE as well.

So, this is a nice figure from Tim Fernandez in the San Diego group. So, we estimate that the incidence of acute PE in the U.S. is about 300,000. Based on our evidence of persistent perfusion defects, that would come out to an incidence with about 90,000 patients who have persistent perfusion defects. And from there, the diagnosis of either CTED or CTEPH; CTED, we don't quite have a good incidence estimate for but for CTEPH, it's anywhere up about 3,000 patients. The incidence of undiagnosed acute PE is the big question mark here. And then nicely, actually, Tim Fernandez's group recently just published on the likelihood of patients with CTED progressing to CTEPH, and it wasn't a very high number at all in that study. So these look like two different populations of patients.

Some of the risk factors that are important to highlight, and I know we mentioned it in the last case, but there are risk factors for the development of CTEPH with pretty high odds ratios. So there are things that the comorbid conditions that have high odds ratios or high risk factors for a CTEPH, and then there are certain clinical characteristics at the time of an acute PE, that's more likely to develop CTEPH. So the comorbid conditions are things like a VA shunt, having had a splenectomy, patients who have very few but very characteristic hypercoagulable state like anti-phospholipid syndrome, and then things like a massive or submassive PE, having RV dysfunction at the time of the diagnosis of PE, and if they've had symptoms for greater than 2 weeks before the diagnosis or initiation of anticoagulation.

So with that, the same executive summary, and I'll hand it off to Dr. Schimmel, who will be talking to us about balloon pulmonary angioplasty.

Announcer:
You have been listening to CME on ReachMD. This activity is jointly provided by Global Learning Collaborative (GLC) and TotalCME, LLC. and is part of our MinuteCE curriculum.

To receive your free CME credit, or to download this activity, go to ReachMD.com/CME. Thank you for listening.