Treatment of pulmonary embolism: The use of low-molecular-weight heparin in the inpatient and outpatient settings

1. Describe the case or problem that attracted you to this paper

"A very pleasant 68 year old male trucker was seen in the emergency room after a long drive, complaining of hemoptysis following a rear-end motor vehicle accident. CT chest showed small bilateral pulmonary emboli. I wondered if he should be treated as an inpatient or an outpatient for his PE."

2. Explain how you came across this article

"I found this paper by searching pubmed clinical queries/systematic review under the heading *pulmonary embolism management*."

3A. Describe the study

"This article was a review of multiple studies, from smaller dose-finding/pilot studies, larger phase III/IV studies, and meta-analyses. The population studied was broad, including multiple states and nations, home care, emergency rooms, medical ICUs, and academic medical centers. This was a review article designed to explore the current data on management of pulmonary embolism."

3B. Describe the research question

"What is the total cost, relative mortality, and recurrence of venous thromboembolism in patients treated with LMW heparin compared to UFH, and what are the recommendations for inpatient treatment compared to outpatient treatment of patients diagnosed with VTE in the emergency room?"

4. State the importance/relevance/context of the question

"PE carries a significant risk of mortality, with a 16.9% 28-day case-fatality rate. Traditionally, patients with PE have been treated with adjusted dose UFH. The potential benefits of LMWH therapy in the management of PE may be underestimated."

5. Describe the methods by giving more detail on the components of the question

P: "The study included patients diagnosed with VTE." IC: "LMWH or UFH, inpatient or outpatient." O: "LMWH reduced risk of death over 3-6 months of follow up, cost, and risk of major bleeding."

6. State your answers to the Critical appraisal questions on validity

"The meta-analysis was of randomized controlled trials. Each group started with a similar prognosis. Most trials compared inpatient LMWH to UFH until VKA was therapeutic. Randomization was biased with LMWH subcutaneous and UFH intravenous. Other studies described were biased by inpatient stay with UFH vs. outpatient anticoagulation with LMWH.

7. Summarize the primary results

"LMWH reduced the risk of death over 3-6 months of follow-up (OR 0.71; 95% CI 0.53 to 0.94), reduction in the risk of major bleeding (OR 0.57; CI 0.33 to 0.99). LMWH and UFH were similar in preventing recurrence of VTE (OR 0.85; CI 0.63 to 1.14)"

8. Describe why you think the results can or cannot be applied to your patient/situation

"This date can be applied to our situation with a trucker presenting with a submassive pulmonary embolism. The pulmonary embolism severity index (Age, male sex, cancer, CHF, lung disease, pulse > 110, systolic < 100, RR > 30, T < 36, AMS, SaO2 < 90%) may help select patients with a very low adverse event rate for outpatient management. In any case, LMWH would be appropriate.

9. Conclude with your own decision about the utility of the study in your practice – Resolve the case or question with which you began

“LMWH is associated with improved mortality, less cost, decreased bleeding risk compared to UFH. I will use this therapy more often. Selection of patients for outpatient management remains unclear and I may offer tend to offer inpatient hospitalization to patients with poor home resources or hemodynamic changes.