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Prophylactic Use of LMWH vs UFH in PE Patients

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Purpose

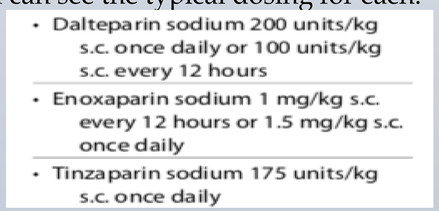
The purpose of this review of literature was to compare the efficacy, safety, and cost of LMWH with UFH and make decisions about selecting the best prophylactic therapy for PE patients.

PICOT Statement

- **Population**: Patients effected with PE
- **Intervention**: Prophylactic use of LMWH
- **Comparison**: Prophylactic use of UFH
- **Outcome**: decrease in the morbidity and mortality of PE
- **Timeline**: During time of prophylaxis of PE

Interventions

- Unfractionated Heparin (UFH)
  - A Standard dose of UFH consists of an IV bolus of 80U/kg followed by a continuous infusion of 18U/kg/hr.
- Low Molecular Weight Heparin (LMWH)
  - There are many different compounds of LMWH, but the most common ones used are Enoxaparin Sodium, Dalteparin Sodium, and Tinzaparin Sodium. Below, you can see the typical dosing for each.



  - LMWH dosage is determined by weight, therefore it can be administered in the out-patient setting
- Both LMWH and UFH require 5-7 initial days of warfarin therapy, with a therapeutic INR goal of 2-3 and aPTT goal of 1.5-2.5x control value. Once these lab values are reached, the patient is on P.O therapy for 3-6 months, depending on the level of risk.

Summary

- UFH and LMWH both decrease the risk of PE with no significant difference in prophylaxis
- LMWH decreases the risk of major hemorrhage by 52% compared to UFH.
- Shorter hospital stays are associated with the use of LMWH because home therapy is an option
- The overall cost of LMWH is less than UFH that could potentially save the U.S. $250 million a year.

Background

- Pulmonary Embolism (PE) is the third leading cause of cardiovascular death in the United States with at least 950,000 deaths annually.
- PE is the most preventable cause of unexpected deaths in hospitalized patients, however, it is the most common.
- 50-80% of these cases are asymptomatic, with 70% of these cases going undetected until it's too late.
- Virchow's Triad identifies the three major underlying factors that contribute to PE
  - Stasis (changes in blood flow pattern)
  - Injury (changes in blood vessel wall)
  - Hypercoagulability (change in consistency of blood)
- Risk Factors include:
  - Age > 50
  - History of:
    - Varicose veins
    - Myocardial Infarction
    - Cancer
    - Atrial fibrillation
    - Ischemic stroke
    - Diabetes mellitus
- Signs and Symptoms
  - Redness
  - Swelling
  - Rash
  - Hypotension
  - Dyspnea
  - Tachycardia
  - Chest discomfort
  - Hypoxemia
  - Respiratory arrest
  - death

Conclusion

- Overall, the use of LMWH is proven to be more beneficial than the use of UFH in PE prophylaxis.
- There are several advantages including a decrease in the risk of heparin induced thrombocytopenia and hospital length of stay.
- Because LMWH is an effective home therapy due to its consistent effects, it eliminates the need for intense lab monitoring of aPTT and INR values.

Gaps in the Literature

- Larger, more diverse sample size was needed in the article discussing the new JFK Risk Assessment tool.
- Some studies suggested different time frames for long term anticoagulant use, regardless of the use of UFH or LMWH.
- Dosage recommendations for UFH and LMWH fluctuated.
- Overall, the population size was good, validity and reliability were tested in all research studies use in this review of literature.

References

- Copeland DC, & Gretzer MB. (2006). Deep venous thrombosis: evidence-based prevention strategies. *Contemporary Urology*, *18*(5), 48-54.
- Dipaola CA. (2008). Patient safety first. Preventing deep vein thrombosis: a perioperative nursing imperative. *AORN Journal*, *88*(2), 283-285.
- Elisha, S., Heiner, J., Nagelhout, J., & Gabot, M. (2015). Venous Thromboembolism: New Concepts in Perioperative Management. *AANA Journal*, *83*(3), 211-223.
- McCaffrey R, Bishop M, Adonis-Rizzo M, Williamson E, McPherson M, Cruikshank A, … Lauzon C. (2007). Development and testing of a DVT risk assessment tool: providing evidence of validity and reliability. *Worldviews on Evidence-Based Nursing*, *4*(1), 14-20.
- Nadeau C, & Varrone J. (2003). Treat DVT with low molecular weight heparin. *Nurse Practitioner*, *28*(10), 22-31.
- Nutescu EA. (2007). Assessing, preventing, and treating venous thromboembolism: evidence-based approaches. *American Journal of Health-System Pharmacy*, *64*, S5-13.