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Promoting DVT Prevention Through Hydration: Essential to Safely Administering Low Molecular Heparin in Anticoagulation Therapy

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Problem: Renal toxicity from low molecular weight heparin (LMWH) bioaccumulation may occur when administering low molecular anticoagulation heparin therapy in patients with acute renal dysfunction (ARD). DVT prevention when using LMWH in high risk ARD patient populations may not prudently produce best patient outcomes. While LMWH is safer with less thrombocytopenia, effective and convenient than unfractionated heparin as an anticoagulation therapy modality; its liberal use in acute renal dysfunction maybe limited with renal insufficiency or volume deficit patients when the metabolic fluid balance is not properly addressed by the clinical nurse healthcare provider.

Purpose: The purpose of this meta-analysis was to review literature ascertaining importance of maintaining therapeutic fluid balance in anticoagulation therapy with LMWH preventing potential acute renal complications.

Methods: The method used was a literature search: electronic databases, journal references, citation searching, and reviewing articles, Cinahl, ProQuest, and Cochran databases 2008-2017 (Polit & Beck, 2017).

Results: National Institute of Health published thromboembolism acquired risk factors: immobility, dehydration, history of thrombosis, cancer, trauma, surgery, and obesity (www.nih.gov).Dehydration causes poor renal perfusion which can be detrimental with the bioaccumulation of LMWH drug potentially causing serious nephrotoxicity. Meta-analysis, comparing enoxaparin and unfractionated heparin, found that subcutaneous enoxaparin administered once daily decreased risks developing venous thromboembolism compared to unfractionated heparin (Laporte, 2011). Enoxaparin LMWH resulted in 37% decline in venous thromboembolic events. Singer (2016) found anti-Xa enoxaparin dosing reduced DVT rate from 20.5% to 7.1%; however in high risk trauma volume depleted patients and or in patients volume deficit induced acute renal failure; LMWH bioaccumulation will cause a high risk for LMWH renal toxicity.

Discussion: Nurses focusing on adequate and judicious fluid management when promoting DVT prevention specifically with LMWH is essential. A plan for enhancing patient tolerance for fluid intake and vigil resuscitation from volume deficit is primordial. Patients receiving plenty fluids inclusive during care and at meal times when ever possible is a nursing priority. Metabolic and hematological labs, urine consistency, output and concentration, S & S of dehydration, low blood pressures, tachycardia and activated partial thromboplastin time are outcome driven nurse sensitive benchmarks that must be explicitly monitored during LMWH.

Implications: Meticulous blood serum metabolic and symptomatic patient consistent observations will drastically reduce ominous risk factors when administering LMWH in anticoagulation therapy for all patients. Specific labs such as the basic metabolic profiles specific to blood urea nitrogen, creatinine ratios, and electrolytes in consideration for hemo-concentration and or hemo-dilution evaluation is beneficial. Blood serum osmolality is an effective guide to fluid balance with benchmark serum osmolality 270–*300* milliosmoles/kilogram (mOsm/kg) of water assessing for fluid balance preventing hyperosmolar conditions.

Conclusion: Promoting best clinical nursing practices are essential when managing acutely difficult patient scenarios thus a building culture of safety, enhancing quality nursing care and positive patient outcomes.

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Abstract Summary:

The purpose of this meta-analysis was to review literature ascertaining importance of maintaining therapeutic fluid balance in anticoagulation therapy with LMWH preventing potential renal complications.

Content Outline:

I. Anticoagulant Therapy

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IV. Proper Hydration is Essential

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