The Low Molecular Weight Heparin, Tinzaparin, in Thrombosis and Beyond

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**ABSTRACT**

Standard unfractionated heparin (UFH) has been in clinical use for over 50 years. The commercial use of low molecular weight heparins (LMWHs) began in the mid 1980s for hemodialysis and the prophylaxis of deep vein thrombosis (DVT). Initially, the clinical development of LMWHs was concentrated on the European continent. Subsequently, LMWHs were introduced in North America as well. In the initial stages of development of these drugs only nadroparin, dalteparin and enoxaparin were used. Subsequently, several other LMWHs such as ardeparin, tinzaparin, reviparin and parnaparin were introduced. LMWHs constitute a group of important medications with total sales reaching nearly 2.5 billion dollars with expanded indications reaching far beyond the initial indications for the prophylaxis of post-surgical DVT. This review highlights the pharmacology of tinzaparin. Unlike other LMWHs, tinzaparin is prepared by enzymatic hydrolysis with heparinase, while various chemical depolymerization methods are used for the synthesis of other LMWHs. As compared with the standard heparin, LMWHs have different pharmacodynamic, and pharmacokinetic properties; they also differ in clinical benefits.