Postoperative Complications in Trauma Patients Receiving VTE Prophylaxis

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Purpose: Optimal venous thromboembolism (VTE) prophylaxis agent following surgical fixation in trauma patients remains widely debated. There is evidence for VTE prophylaxis in hip fracture patients. Pelvis fractures and fractures around the knee still hold a relative increase in VTE risk, yet evidence for VTE prophylaxis and agent selection is lacking. Conducting randomized controlled trials on this topic can be problematic given a low VTE and PE (pulmonary embolism) incidence and the potential harm of withholding treatment. However, large nationwide health-care data sets offer the benefit of large sample sizes and evaluation of multiple treatment regimens. We aimed to identify postoperative complications associated with VTE chemoprophylactic agents in trauma patients with fracture around the hip (pelvis/proximal femur) and knee (distal femur/proximal tibia).

Methods: A retrospective analysis of nationwide health-care data was conducted within the PearlDiver database from 2010 to 2020. Trauma patients without a VTE history were identified with CPT codes for surgical fixation of fractures around the hip and knee. Patients with single-agent VTE chemoprophylaxis (direct factor Xa inhibitor [xabans], aspirin, warfarin, or low-molecular-weight heparin [LMWH]) within 30 days postoperatively were included. Multivariate regression assessed 30-day and 90-day postoperative PE, VTE, and non-thromboembolic complications (NTC) such as infection, incision/drainage, hematoma, and hemorrhage (30-day risk of PE [PE-30], 30-day risk of VTE [VTE-30], 30-risk of NTC [NTC-30]). Significance was set to $P<0.05$.

Results: 22,524 of 161,827 hip patients received single medication VTE chemoprophylaxis. Aspirin had a decreased PE-30 and NTC-30 (odds ratio [OR] 0.14 and 0.74, respectively). LMWH had reduced PE-30, DVT-30, and NTC-30 (OR 0.35, 0.37, and 0.77). Warfarin had increased PE-30 and DVT-30 (OR 4.24 and 1.5). Xabans had reduced PE-90, increased DVT-30, and reduced NTC-30 and NTC-90 (OR 0.24, 4, 0.59, and 0.67). 11,425 of 74,495 knee patients received single medication VTE chemoprophylaxis. Aspirin had decreased PE-30 and DVT-30 (OR 0.19 and 0.3, respectively). LMWH had decreased PE-30 and DVT-30, increased DVT-90, and increased NTC-30 and NTC-90 (OR 0.26, 0.43, 1.65, 1.2, and 1.3). Warfarin had increased PE-30, PE-90, DVT-30, and NTC-30 (OR 8.29, 2.29, 3.69, and 1.79). Xabans had increased PE-30, DVT-30, and DVT-90 as well as reduced NTC-90 (OR 2.27, 8.56, 2.06, and 0.43).

Conclusion: Aspirin reliably reduced 30-day PE events and did not have increased odds of VTE or NTC in trauma patients with either hip or knee fractures. In these trauma patients, aspirin is the most effective single agent in preventing VTE without any significant measured complications.