



TROMBOEMBOLISMO VENOSO: ASPETTI CLINICI E
DIAGNOSTICI

SEX-RELATED DIFFERENCES AND PREDICTORS OF MORTALITY IN MAJOR ORTHOPEDIC SURGERY: INSIGHTS FROM THE ORTHO-START REGISTRY

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Background. Sex-related differences in outcomes after major orthopedic surgery remain under-investigated, and the prognostic relevance of a history of venous thromboembolism (VTE) is unclear.

Aims. To investigate sex-related differences in clinical characteristics, peri-operative management, and postoperative outcomes.

Methods. The ORTHO-START registry is a prospective, multicenter study including 1,077 consecutive adults undergoing major orthopedic surgery (elective hip/knee arthroplasty or urgent hip fracture repair) across six Italian centers between July 2018 and March 2022. Baseline characteristics, perioperative complications, and antithrombotic therapy were collected. The primary outcome was all-cause mortality at 24 months; secondary outcomes were thromboembolic and bleeding events. Multivariable logistic regression identified predictors of mortality.

Results. Women represented 72.3% (n = 775) of the cohort and were older than men (80.6 ± 10.0 vs. 76.2 ± 13.0 years, p < 0.001). Urgent procedures comprised 65.6% (n = 706) of surgeries, predominantly involving women (n = 542). At 24 months, mortality was higher in men (31% vs. 18%, p = 0.018). Table shows factors predicting mortality at univariate analysis and multivariable logistic analysis. Independent predictors of mortality included male sex (OR 2.6, 95% CI 1.8-4.0), older age, lower BMI, urgent surgery (OR 7.2, 95% CI 4.1-12.4), and prior VTE (OR 5.7, 95% CI 1.4-23.9). Causes of death were known for 160/210 (76.2%):

neurological complications were most frequent (25%), followed by cardiovascular disease (21.3%) and immobility-related causes (14.4%); pulmonary embolism accounted for 1.3% of deaths. Thrombotic and hemorrhagic events occurred in both sexes without significant differences.

Conclusions. Male sex and a history of VTE are independent predictors of long-term mortality following major orthopedic surgery. Incorporating these factors into preoperative risk assessment may improve management and postoperative outcomes.

Table. Predictors of mortality

Panel a. Univariate analysis

Variable	OR	95%CI
Male Sex	2.64	1.73-4.02
Age	1.06	1.03-1.08
BMI	0.95	0.90-0.99
Hb	0.90	0.82-0.99
Active cancer	4.08	1.36-12.22
Previous VTE	6.25	1.23-33.77
Urgent surgery	4.87	2.60-9.11

Panel b. Logistic regression

Variable	OR	95%CI
Male Sex	2.40	1.60-3.70
Age	1.07	1.05-1.09
Previous VTE	5.02	1.10-23.72
Urgent surgery	5.20	2.93-9.22

Hb: Hemoglobin; BMI: Body Mass Index; VTE: Venous Thromboembolism