Anticoagulant Treatment Patterns and Thromboembolic Events by Tumor Type among Patients with VTE and Cancer

Poster 82787

Shrushti Shah[1], Amol D Dhamane[2], Mauricio Ferri[2], Robert Bruette[1], Virginia Noxon[1], Xuejun Liu[2], Jenny Jiang[2], Xuemei Luo[3]

[1]STATinMED Research, Plano, TX, USA; [2]Bristol Myers Squibb Company, Lawrenceville, NJ, USA; [3]Pfizer Inc., Groton, CT, USA

Background and Rationale

- Cancer patients with venous thromboembolism (VTE) are at a higher risk of a recurrent VTE and mortality compared to cancer patients without VTE.[1,2]
- Guidelines recommend anticoagulant treatment (apixaban, rivaroxaban, dabigatran, edoxaban, low-molecular-weight heparin [LMWH], and warfarin) for cancer patients with VTE.[3]
- There is limited real world data about how anticoagulant treatment and thromboembolic outcomes (recurrent VTE, major bleeding [MB]) differ by tumor type in patients with VTE and cancer.
- Understanding such differences may help identify appropriate anticoagulant treatment for specific tumor types.

Objective

- To describe anticoagulant treatment patterns and assess the occurrence of MB, and recurrent VTE events by tumor type among patients with VTE and cancer.

Methods

- **Study Design/Data Source**
  - This was an observational retrospective cohort analysis using the SEER Medicare linked database.
- **Patient Population**
  - Cancer patients with VTE aged ≥65 years were identified from the SEER-Medicare database from 01JAN2014-31DEC2019.
  - Patients were required to be enrolled for ≥6 months prior to their first VTE (index) without evidence of precipitating factors.
  - Patients were also required to be enrolled for ≥30 days after index.
  - Cancer status was identified as active cancer (≥2 cancer diagnoses, or 1 cancer diagnosis plus ≥1 cancer-related treatment) from SEER or Medicare in the 6 months prior through 30 days post VTE.
  - Patients were required to have a prescription for an anticoagulant (dabigatran [includes LMWH bridging], rivaroxaban, edoxaban, warfarin [includes LMWH bridging], unfractionated heparin, or fondaparinux) treatment within 30 days after index VTE.
  - Full inclusion and exclusion criteria are shown in Figure 1.
- **Cohorts**
  - Patients were assigned to the following cohorts based on their tumor identified from SEER or Medicare: pancreas, stomach, brain, breast, and prostate.
- **Study Outcomes**
  - Recurrent VTE and MB were defined by the primary diagnosis in the inpatient setting during the follow-up period. Hospitalizations within 7 days of index VTE were not considered as a recurrent VTE event.

Results

Patient Population

Figure 1

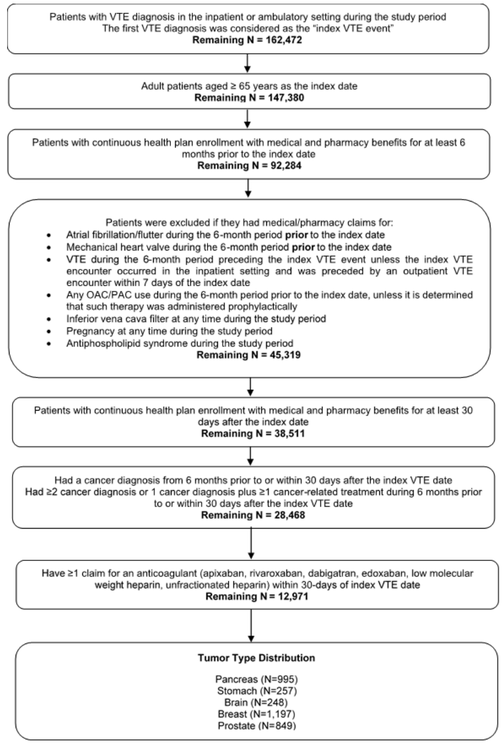
- 12,971 anticoagulated patients with VTE and cancer met initial study criteria. 3,546 (27.3%) had a cancer of interest (breast [n=1,197], prostate [n=849], pancreatic [n=995], brain [n=248] and stomach [n=257] cancer).

Table 1

- Patient demographics and baseline comorbidities were generally consistent across tumor types.
- Index VTE event was generally a DVT event; overall, ~33% of the events were identified in the inpatient setting.
- Metastasis was most prevalent among pancreatic and stomach cancer patients.

Results (continued)

Figure 1. Patient Selection



OAC: oral anticoagulant; PAC: parenteral anticoagulant; VTE: venous thromboembolism

Treatment Patterns

Figure 2

- LMWH was most commonly used among high-risk patients (brain, pancreas, and stomach).
- Unfractionated heparin use was noted across tumors of interest (2.0% [brain]-8.2% [stomach]).
- Apixaban and rivaroxaban were more commonly used among breast and prostate cancer patients.

Study Outcomes

Figure 3

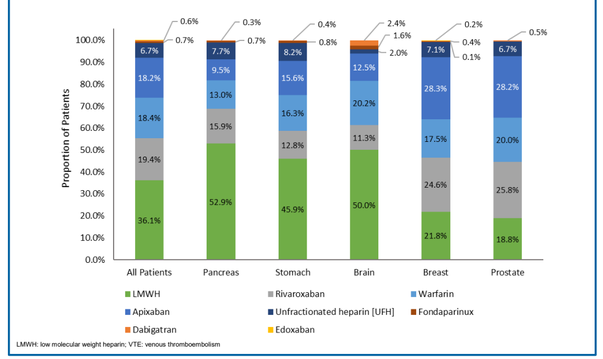
- Incidence of MB and recurrent VTE varied by tumor type
  - Incidence of MB ranged from 1.4 (breast) to 6.4 (pancreas) per 100 person-years
  - Incidence of recurrent VTE ranged from 4.3 (prostate) to 15.1 (pancreas) per 100 person-years

Table 1. Patient Characteristics

	Pancreas	Stomach	Brain	Breast	Prostate
	N=995	N=257	N=248	N=1,197	N=849
Demographic Variables					
Age, Mean (SD)	74.5 (6.3)	75.6 (7.0)	73.4 (5.5)	75.0 (6.9)	74.5 (6.6)
Age Group					
65-74	559 (56.2%)	121 (47.1%)	158 (63.7%)	661 (55.2%)	475 (55.9%)
75-79	221 (22.2%)	65 (25.3%)	56 (22.6%)	235 (19.6%)	200 (23.6%)
≥80	215 (21.6%)	71 (27.6%)	34 (13.7%)	301 (25.1%)	174 (20.5%)
Gender					
Male	409 (41.1%)	137 (53.3%)	115 (46.4%)	20 (1.7%)	849 (100.0%)
Female	586 (58.9%)	120 (46.7%)	133 (53.6%)	1,177 (98.3%)	0 (0.0%)
Race					
Black	132 (13.3%)	42 (16.3%)	18 (7.3%)	185 (15.5%)	124 (14.6%)
White	766 (77.0%)	179 (69.6%)	204 (82.3%)	938 (78.4%)	650 (76.6%)
Others	97 (9.7%)	36 (14.0%)	26 (10.5%)	74 (6.2%)	75 (8.8%)
VTE-Related Variables					
Setting of Index VTE Event					
Inpatient	327 (32.9%)	107 (41.6%)	96 (38.7%)	387 (32.3%)	250 (29.4%)
Ambulatory	668 (67.1%)	150 (58.4%)	152 (61.3%)	810 (67.7%)	599 (70.6%)
Index VTE Diagnosis					
DVT only	527 (53.0%)	129 (50.2%)	154 (62.1%)	646 (54.0%)	456 (53.7%)
PE with DVT	211 (21.2%)	50 (19.5%)	47 (19.0%)	224 (18.7%)	195 (23.0%)
PE without DVT	257 (25.8%)	78 (30.4%)	47 (19.0%)	327 (27.3%)	198 (23.3%)
Non-Cancer Provoked Factor*	417 (41.9%)	124 (48.2%)	176 (71.0%)	313 (26.1%)	266 (31.3%)
Comorbidity-Related Variables					
NCI Comorbidity Index	3.2 (2.5)	2.9 (2.8)	3.1 (2.2)	2.6 (2.5)	2.7 (2.6)
Comorbidities					
Anemia	491 (49.3%)	156 (60.7%)	92 (37.1%)	476 (39.8%)	307 (36.2%)
Thrombocytopenia	128 (12.9%)	26 (10.1%)	63 (25.4%)	72 (6.0%)	67 (7.9%)
Obesity	156 (15.7%)	41 (16.0%)	52 (21.0%)	321 (26.8%)	194 (22.9%)
Diabetes	488 (49.0%)	94 (36.6%)	90 (36.3%)	395 (33.0%)	273 (32.2%)
Renal Disease	157 (15.8%)	49 (19.1%)	39 (15.7%)	249 (20.8%)	222 (26.1%)
Liver Disease	413 (41.5%)	50 (19.5%)	30 (12.1%)	110 (9.2%)	98 (11.5%)
Baseline Any Bleed	304 (30.6%)	111 (43.2%)	83 (33.5%)	241 (20.1%)	248 (29.2%)
Cancer-Related Variables+					
Cancer Metastasis	803 (80.7%)	154 (59.9%)	68 (27.4%)	480 (40.1%)	318 (37.5%)
Cancer Metastasis Anytime Prior to Index Date**	6 (0.6%)	1 (0.4%)	4 (1.6%)	10 (0.8%)	23 (2.7%)
Cancer-Related Treatment^					
Chemotherapy	909 (91.4%)	222 (86.4%)	222 (89.5%)	754 (63.0%)	589 (69.4%)
Hormone Therapy	1 (0.1%)	0 (0.0%)	0 (0.0%)	504 (42.1%)	3 (0.4%)
Immunotherapy	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (0.1%)
Radiation	799 (80.3%)	207 (80.5%)	213 (85.9%)	603 (50.4%)	466 (54.9%)
Cancer-related Surgery	39 (3.9%)	18 (7.0%)	103 (41.5%)	219 (18.3%)	23 (2.7%)
Follow-Up Time (in days)	254.2 (367.0)	471.2 (502.0)	361.6 (438.4)	688.0 (546.6)	700.5 (528.6)

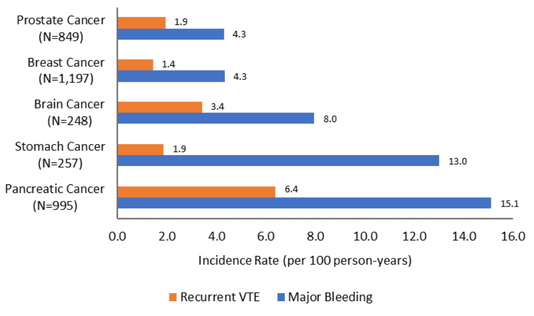
*Provoked VTE was defined as VTE that is preceded by hormone therapy, fracture/trauma involving lower extremities, pelvic/orthopedic surgery, or hospitalization for any reason for ≥ 3 days during the 3 months prior to the index VTE event.
+ Cancer-related variables were measured 6 months prior to VTE index date until 30 days after index date.
**Excludes metastasis in the immediate 6-months prior to index date
DVT: deep vein thrombosis; NCI: National Cancer Institute; SD: standard deviation; VTE: venous thromboembolism

Figure 2. Anticoagulant Treatment Patterns among VTE Patients with Cancer by Tumor Type



LMWH: low molecular weight heparin; VTE: venous thromboembolism

Figure 3. Incidence of Major Bleeding and Recurrent VTE among Patients with VTE and Cancer



VTE: venous thromboembolism

Limitations

- As with all claims data, laboratory results such as international normalized ratios were unavailable, diagnoses were identified using ICD-9/10-CM codes, and drug prescriptions were identified through prescription claims. Missing values, coding errors, and lack of clinical accuracy may have introduced bias into the study.
- Observed outcomes are short term and may not reflect long-term outcomes.
- The study design is observational and does not reflect any causal associations.
- Treatment is based on the assumption that patients take their treatment and does not account for any inpatient treatment use.

Conclusions

- **Notable variations in anticoagulant treatment patterns and outcomes (MB, recurrent VTE) were observed by tumor type among patients with VTE and cancer.**
- **Further research is needed to understand these variations and determine if a tumor-specific approach to anticoagulant treatment is needed.**

References

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Disclosures

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