

VTE Management in Primary Brain Neoplasms

A retrospective cohort study in a Canadian tertiary center between 2013 and 2023

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1 Introduction

Patients with primary brain neoplasms face elevated risks of both venous thromboembolism events (VTE) and intracranial hemorrhage (ICH). Despite broad direct oral anticoagulation (DOAC) use in cancer-associated VTE, this population is often underrepresented. This study describes VTE management and related complications in brain neoplasm patients at *Centre hospitalier Universitaire de Sherbrooke (CHUS)*.

2 Methods

- Retrospective cohort study
- **Inclusion criteria:** adults with active primary brain neoplasm and concurring radiologically proven VTE
- **Exclusion criteria:** non-malignant brain tumors, superficial VTE, pregnancy, anticoagulation at VTE diagnosis, recent (2weeks) thrombolysis, VTE diagnosis >3mo before neoplasm or >6mo after recovery
- 3 definitive treatment subgroups were identified: Low molecular weight heparin (LMWH), DOAC, no anticoagulation

3 Results

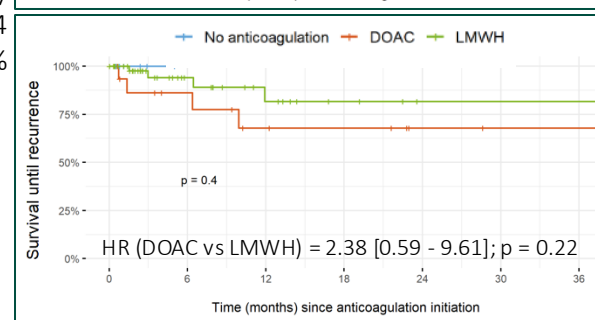
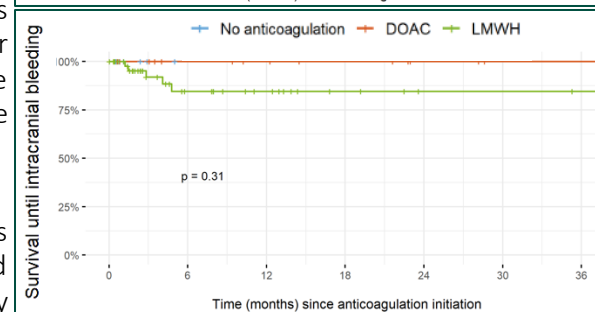
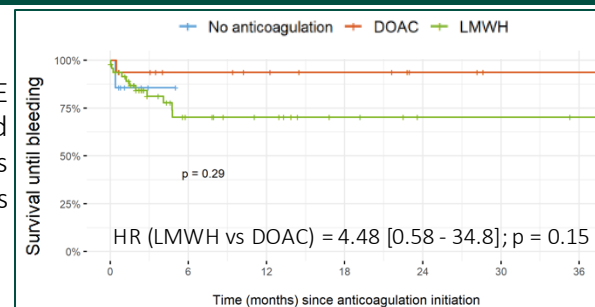
Population	n = 73
Median follow-up (months)	5.8
Mean age	61.3 y.o.
Female	34%
Mean weight (kg)	85.5
Glioma as CNS neoplasm	62%
Pulmonary embolism (PE) as VTE	71.2%
Deep venous thrombosis (DVT) as VTE	46.6%
PE plus DVT as VTE	17.8%
Median delay between VTE and neoplasm diagnosis	164 days
LMWH as definitive anticoagulation	49 (67%)
DOAC as definitive anticoagulation	17 (23%)
No anticoagulation (contraindication)	7 (10%)

Anticoagulation complications	No anticoagulation (N= 7)	DOAC (N=17)	LMWH (N=49)
All bleeding	1 (14%)	1 (6%)	12 (25%)
ICH	0	0	5 (10%)
VTE recurrence	0	5 (29%)	6 (12%)

• Patients with proximal PE received IV unfractionated heparin more often as initial treatment (59% vs 14% and 11% p=0,0145)

• No significant differences in VTE diagnosis or biochemical factors were found between definitive treatment groups.

• DOAC patients were less likely to have received chemotherapy or any cancer treatment within 4 weeks prior to VTE (35% vs 70%, p=0.047).



4 Discussion

- In our study, primary brain neoplasm associated VTE was mostly anticoagulated with LMWH.
- Patients in the DOAC group were significantly less likely to have received any active neoplasm treatment or chemotherapy in the 4 weeks prior to VTE diagnosis, suggesting DOACs may have been preferentially prescribed for those with less active cancer.
- LMWH was associated with a non-significant higher bleeding risk, including ICH, compared to DOAC.
- DOACs was associated with a non-significant higher VTE recurrence risk compared to LMWH.

Limitations:

- Retrospective data, small cohort
- Definitive anticoagulation cessation or class switch at complication diagnosis may overestimate complications
- Palliative care of some patients may underestimate complications

5 Conclusions

In this ten-years unicentric retrospective cohort study, preferred treatment for primary brain neoplasm associated VTE was LMWH. Our results, though not statistically significant, suggest a slightly higher rate of bleeding with LMWH, while DOACs seems to be associated with a modest increase in incidence of VTE recurrence. These exploratory results highlight the need for further prospective studies to guide treatment decisions in this high-risk population.



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Conflict of Financial Interest Disclosure

Authors		Conflict disclosures
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