Analysis of Venous Thromboembolism (VTE) Hospital Management from Real-World French Administrative Database

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Introduction

Venous thromboembolism (VTE) is caused by the formation of a thrombus in the bloodstream. VTE includes deep vein thrombosis, which can evolve to embolism if the thrombus breaks off. VTE is a frequent pathology, with an annual incidence of 1 to 2 per 1,000 inhabitants in France and a severe pathology, with a 3-month mortality between 10 and 15 % [1].

However very few real-world data are available in France on those patients and their hospital management.

Objectives

Primary objective

To describe the incidence and prevalence of venous thrombosis and embolism (VTE) in France.

Secondary objectives

To describe VTE patients characteristics.

To describe VTE inhospital management and associated costs.

To describe VTE inhospital mortality.

Methods

A retrospective cross-sectional study was conducted using the French exhaustive National hospital discharge database (PMSI).

Study period

VTE patients were included between 2014 and 2017 and followed until 2018. A retrospective follow-up over the 2 years prior to inclusion was performed to study incidence and comorbidities.

Inclusion criteria

Adult patients (≥18 years old) with VTE ICD-10 code in DP (Principal Diagnosis), DR (Related Diagnosis), DAS (Associated diagnosis).

The study was conducted for the whole VTE population and on two distinct cohorts:

- patients with venous thrombosis (I80*, I820 I821, I636, I676, O222, O223, O225, O870, O871 and O873)
- patients with embolism (I26*, I822, I823, I828, I829 and O882).

Conclusion

This study provides a recent and detailed description of VTE patients and their hospital management in France.

The number of VTE patients increased from 133,633 to 143,873 between 2014 and 2017 with more than 90 % of incident patients.

VTE patients hospital management was found to be associated with a high economic burden between 235.3 M€ and 244.3 M€ each year, mainly caused by the first hospital stay

The study has been done through PMSI analysis, a medico-administrative database collecting all reimbursed hospital patient cares in France. It is thus exhaustive. However, Deaths outside hospitals are not collected in the PMSI database.

Results

Median follow-up time was 33.5 months for VTE patients (34.5 months for venous thrombosis and 33.5 months for embolism).

Incidence and prevalence & Annual VTE hospital management burden

Note: Patients who went through both a venous thrombosis event and an embolism event during the same year were counted in both the venous thrombosis patients and in the embolism patients. Thus, the sum of venous thrombosis patients and embolism patients for a given year is higher to the number of VTE patients, as they were only counted once.

	Venous thrombosis			Embolism			VTE		
	Prevalent patients	Incident patients	Hospital burden	Prevalent patients	Incident patients	Hospital burden	Prevalent patients	Incident patients	Hospital burden
2014	81,133	74,392	58.6 M€	77,221	69,332	177.3 M€	133,633	123,255	235.9 M€
2015	82,182	75,511	55.7 M€	78,947	71,069	179.6 M€	136,229	126,172	235.3 M€
2016	83,617	75,937	55.3 M€	84,064	74,899	189.1 M€	141,677	129,918	244.3 M€
2017	84,166	75,362	52.0 M€	85,897	75,212	186.8 M€	143,873	129,937	238.8 M€

French VTE burden increased between 2014 and 2017 as well as embolism burden while venous thrombosis burden decreased.

Description of patients

Age and sex	Venous thrombosis	Embolism	VTE
Age, mean ± SD (y)	68.7 ± 17.4	68.4 ± 16.6	68.5 ± 17.2
Male, n (%)	140,085 (46.5 %)	141,600 (48.7 %)	240,872 (47.3 %)

Risk factors	Venous thrombosis	Embolism	VTE
Surgery	10.6%	10.7%	10.8%
Trauma	3.6%	3.3%	3.4%
Stroke	0.6%	0.6%	0.6%
Heart failure	1.3%	1.2%	1.3%
Respiratory failure	0.8%	1.0%	1.0%
Infection	5.4%	5.9%	5.9%
Pregnancy	2.4%	0.7%	1.7%
Cancer	23.1%	27.8%	26.1%
Chemotherapy	7.6%	10.0%	9.1%

Patients were similar between the three groups between 38 and 40 % of patients had at least one comorbidity.

Hospital all-cause mortality

The study has been done through PMSI analysis, deaths outside hospitals are not collected. VTE overall survival probability decreased from 0.95 at one year to 0.92 at 4 years.

Death rate	Venous thrombosis	Embolism	VTE
One year	4.3%	5.5%	5.1%
Two years	5.4%	6.7%	6.2%
Three years	6.1%	7.5%	7.0%
Four years	6.7%	8.1%	7.6%

Hospital management

VTE Length of stay	Inclusion stay			Subsequent stay				
	Venous thrombosis	Embolism	VTE	Venous thrombosis	Embolism	VTE	Hemorrhage	Total
Number of stays	64,384	158,417	222,800	12,886	36,032	48,915	22,333	71,248
LOS, mean ± SD (days)	6.2 ± 6.6	7.7 ± 7.2	7.2 ± 7.1	5.4 ± 7.0	6.0 ± 7.4	5.8 ± 7.3	6.8 ± 12.5	6.1 ± 9.3
Admission through ER ,n (%)	40,570 (63.0 %)	109,980 (69.4 %)	150,549 (67.6 %)	4,040 (31.4 %)	10,456 (29.0 %)	14,496 (29.6 %)	14,018 (62.8 %)	28,514 (40.0 %)

For inclusion stay, mean duration ranged from 6.2 to 7.2 days. For subsequent stay, mean duration ranged from 5.4 to 6.8 days.

Critical care units	Inclusion stay			Subsequent stay				
	Venous thrombosis	Embolism	VTE	Venous thrombosis	Embolism	VTE	Hemorrhage	Total
Resuscitation unit	0.0%	0.3%	0.2%	0.1%	0.3%	0.2%	0.7%	0.4%
ICU	1.5%	4.5%	3.6%	1.3%	4.1%	3.4%	2.1%	3.0%
Continuous monitoring	0.3%	0.9%	0.7%	0.4%	0.9%	0.7%	1.7%	1.0%

Share of critical care units didn't exceed 4.5 % of patients. ICU was the main unit concerned ranging from 1.3 % in subsequent venous thrombosis to 4.5 in intial embolism.

Procedure of interest	Inclusion stay			Subsequent stay				
	Venous thrombosis	Embolism	VTE	Venous thrombosis	Embolism	VTE	Hemorrhage	Total
Thrombectomy	0.0%	0.0%	0.0%	0.1%	0.3%	0.2%	0.0%	0.2%
Thromboaspiration	0.4%	0.2%	0.2%	3.7%	2.4%	2.7%	0.2%	2.0%
Fibrinolysis	0.1%	0.1%	0.1%	1.5%	0.7%	0.9%	0.3%	0.7%
Cava filter placement	0.7%	0.3%	0.4%	6.6%	2.6%	3.7%	2.9%	3.4%

Very few procedures performed during inclusion stays The most performed procedure were cava filter placement ranging from 2.6 % to 6.6 % of VTE subsequent stays.

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