

Risk factors for symptomatic venous thromboembolism in patients with hip fractures

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Background

- Venous thromboembolism (VTE)
 - Up to 50% hip fractures
 - Significant cause of morbidity and mortality
- Highest risk groups
 - Need to be identified

Aims

- Report incidence of VTE
- Examine preadmission risk factors
- Examine surgical risk factors
- Evaluate time course
- Change practice

Patients and methods

- Duration
 - January 1989 - January 2007
- All had subcutaneous heparin for 2 weeks from admission
- Pre fall data
 - Residence
 - Mobility score (0-9; 9 - full mobility)
 - Mental test score (0-10)
 - Smoking status

Patients and methods

- Post fall data
 - Admission Hb
 - Length of time from fall to surgery
 - Length of time from admission to surgery
 - Type of fracture
- Operation data
 - Type of procedure
 - Type of anaesthesia
 - Duration

Patients and methods

- Post op data
 - Time to presentation
- Diagnosis of symptomatic VTE
 - DVT
 - Diagnosed on USS, venography
 - PE
 - Diagnosed on CTPA, nuclear medicine

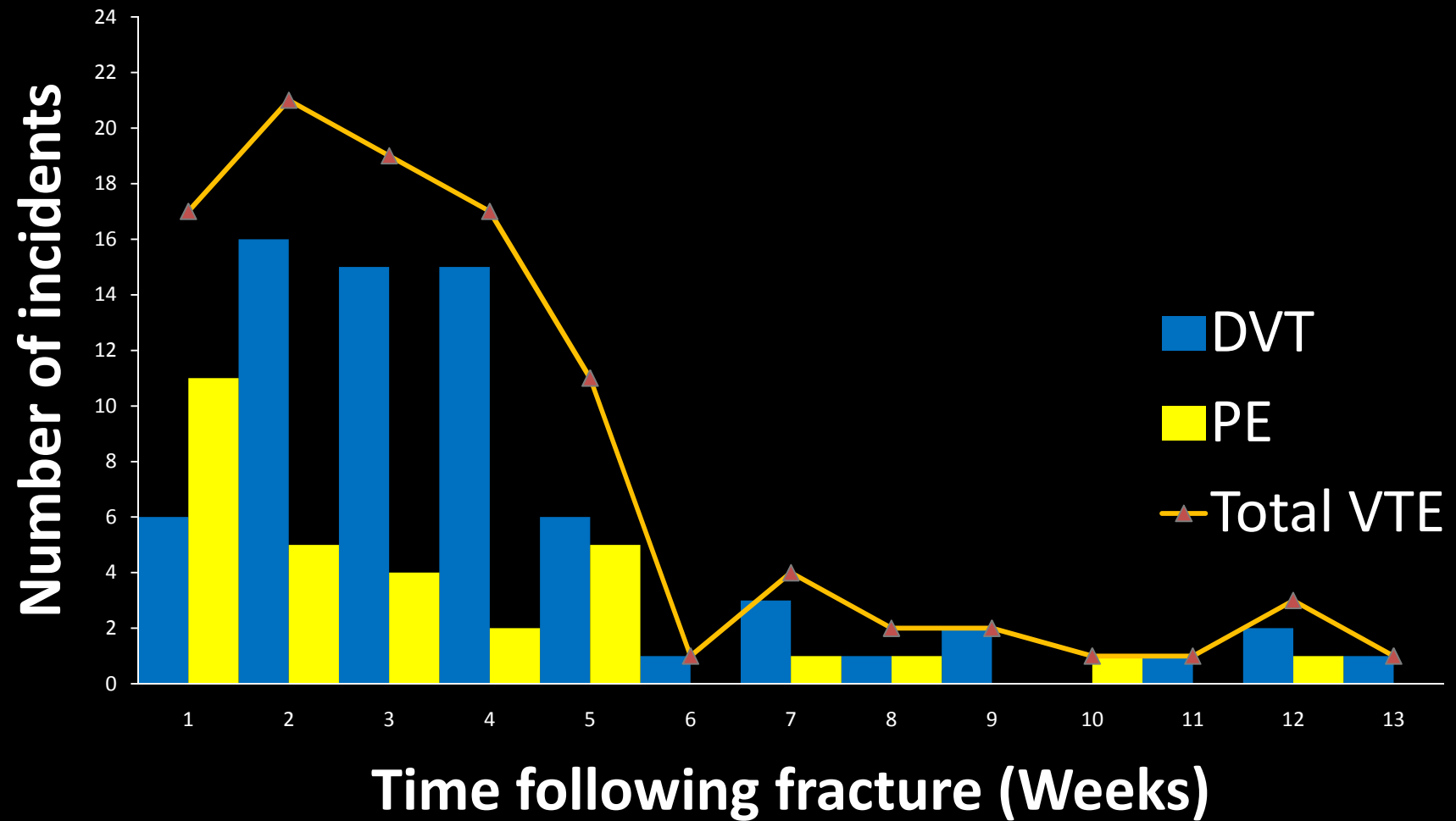
Analysis

- Baseline characteristics VTE to no VTE compared
- Category of VTE
 - Subdivided into DVT and PE
 - Compared with no VTE group
- Significant risk factors for VTE
 - Logistic regression, Multivariate analysisSignificance $p < 0.05$

Results

- 5300 patients
- Average age 80 (47- 103)
- 22% male
- 117 thromboembolic events (2.2%)
 - 79 DVT (1.5%)
 - 38 PE (0.7%)

Occurrence of VTE following hip fracture



Admission summary

No VTE v.s. VTE

- No difference
 - Gender (p=0.26)
 - Age (p=0.72)
 - Smoking (p=0.66)
 - Pathological fracture (p=1)

 - Time from fracture to admission (p=0.8)
 - Time to surgery (p=0.47)

Admission summary

No VTE v.s. VTE

- Significant difference
 - Better Mobility
 - VTE ($p=0.01$), DVT ($p=0.008$), PE (0.63)
 - Residence
 - VTE (0.002), DVT ($p=0.008$), PE ($p=0.42$)
 - Better Mental test score
 - VTE ($p=0.005$), DVT ($p=0.004$), ($p=0.45$)

Admission summary

No VTE v.s. VTE

- Significant difference
 - Higher Admission Hb
 - VTE ($p=0.03$), DVT ($p=0.18$), PE ($p=0.06$)
 - Extra capsular fracture
 - VTE ($p=0.008$), DVT ($p=0.002$), PE (0.8)

Operative details

- No difference
 - ASA grade (p=0.37)
 - Type of anaesthesia (p=0.12)
- Difference
 - Procedure performed
 - DHS and IM nail
 - VTE (p=0.03), DVT (p=0.01), PE (p=0.83)

Logistic regression

		No VTE	Any VTE	Odds ratio (95% CI)	p-value
Sex	Female	4062 (97.6%)	97 (2.3%)	1.00	0.090
	Male	1121 (98.2%)	20 (1.8%)	0.64 (0.38, 1.07)	
Mean age		79.84 (sd=11.1)	79.47 (sd=11.6)	1.00 (0.98, 1.02)	0.91
Residence on admission	home	3715 (97.4%)	99 (2.6%)	2.24 (1.32, 3.82)	0.003
	Institution	1468 (98.8%)	18 (1.2%)	1.00	
Mean admission Hb		124.1 (sd=17.0)	127.6 (sd=17.9)	1.01 (1.00, 1.03)	0.013
Type of fracture	Intracapsular	2917 (98.3%)	50 (1.7%)	1.00	0.001
	Intertroch	2032 (97.0%)	63 (3.0%)	2.15 (1.46, 3.17)	
	Subtroch	180 (97.8%)	4 (2.2%)	1.51 (0.53, 4.30)	

Discussion

- Hip fracture patients – high risk VTE group
- Symptomatic VTE Incidence - 2.2%
- Comparable to literature - heparin
 - Todd (6%)
 - Errikson (2.7%)
 - Rosensher (1.3%)

Discussion

- We identified risk factors:
 - Residence
 - Own home Odds Ratio (OR)= 2.24
 - Admission Hb
 - High Hb OR = 1.01
 - Fracture type
 - Intertrochanteric OR = 2.15
 - Subtrochanteric OR = 1.51

Explanation

- Causes unclear
 - ?patients living alone – lower mortality or report symptoms
 - Previously no risk of type of fracture identified
 - ?bleeding

Summary

- Symptomatic VTE is low
- High risk groups can be identified
- Should extended prophylaxis be offered to high risk groups?

Extended prophylaxis

- Reviews of RCT
 - extended prophylaxis LMWH reduce VTE by half
Eikelboom et al Lancet. 2001 Jul 7;358(9275):9-15
- Reduce our incidence to 1%
 - NNT for this approx. 100
- ?cost effectiveness in hip fracture patients
- If only offered to high risk groups
 - NNT for this approx. 33

Admission characteristics

		No VTE	Any VTE	DVT	PE
Admission mobility score	8-9	1466 (28%)	47 (3.2%)	34 (2.3%)	13 (0.9%)
	4-7	1834 (35%)	38 (2.1%)	27 (1.5%)	11 (0.6%)
	0-3	1881 (36%)	32 (1.7%)	18 (1.0%)	14 (0.7%)
	p-value		0.01	0.008	0.63
Residence on admission	home	3715 (72%)	99 (2.6%)	67 (1.8%)	23 (0.6%)
	Institution	1468 (28%)	18 (1.2%)	12 (0.8%)	6 (0.4%)
	p-value		0.002	0.008	0.42
Mental test score	0-5	1494 (31%)	19 (1.3%)	11 (0.7%)	8 (0.5%)
	6-10	3255 (69%)	85 (2.6%)	60 (1.8%)	25 (0.7%)
	p-value		0.005	0.004	0.45

Admission characteristics

		No VTE	Any VTE	DVT	PE
Mean admission Hb		124.1	127.6	126.7	129.4
	p-value		0.03	0.18	0.06
Type of fracture	Intracapsular	2917 (57%)	50 (1.7%)	30 (1.0%)	20 (0.7%)
	intertroch	2032 (39%)	63 (3.1%)	46 (2.2%)	17 (0.8%)
	subtroch	180 (4%)	4 (2.2%)	3 (1.7%)	1 (0.6%)
	p-value		0.008	0.002	0.80
Median hours fracture to surgery		25	25	25	22.5
	p-value		0.8	0.99	0.23
Median hours admission to surgery		21	22	22	20
	p-value		0.47	0.38	0.99

Operative details

		No VTE	Any VTE	DVT	PE
Type of operation	Hemi-arthroplasty	1645 (32%)	28 (24%)	19 (24%)	9 (24%)
	Sliding hip screw	1863 (36%)	56 (48%)	40 (51%)	16 (42%)
	I.M. nail	327 (6%)	11 (9%)	9 (11%)	2 (5%)
	Multiple screws	1262 (24%)	21 (18%)	11 (14%)	10 (26%)
	Conser-vative	86 (2%)	1 (1%)	0 (0%)	1 (3%)
	p-value		0.03	0.01	0.83