


Troponina, Dimeros D y otros. Ayudan o entorpecen la toma de decisiones II



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TEP

□ Introducción

- 600.000 pacientes año (USA)
- Mortalidad global 17% (tres meses)
- Mortalidad primer día 2.5%
- Tasa de recurrencia: 10% , de los cuales 45% muere
- Si no se trata: 26% de los pacientes tendrán nuevo TEP fatal, otro 26% tendrá un nuevo TEP no fatal

TEP

□ TVP = TEP

- Hasta 50% de los pacientes con TVP tienen TEP asintomático
- 70% de los pacientes con TEP tienen TVP

Fisiopatología

- Triada de Virchow
 - Ectasia
 - Daño de la pared venosa
 - Hipercoagulabilidad

Table 1. Risk Factors for Venous Thromboembolism.

Age >40 yr

History of venous thromboembolism

Surgery requiring >30 min of anesthesia

Prolonged immobilization

Cerebrovascular accident

Congestive heart failure

Cancer

Fracture of pelvis, femur, or tibia

Obesity

Pregnancy or recent delivery

Estrogen therapy

Inflammatory bowel disease

Genetic or acquired thrombophilia

- Antithrombin III deficiency

- Protein C deficiency

- Protein S deficiency

- Prothrombin G20210A mutation

- Factor V Leiden

- Anticardiolipin antibody syndrome

- Lupus anticoagulant

Problemas diagnósticos

- ❑ Acuciosidad diagnóstica: 68% (PIOPED)
- ❑ Manifestaciones clínicas: solo 25% de los pacientes con sospecha de TEP tienen la enfermedad confirmada por test objetivos
- ❑ Estrategia:
 - Identificar pacientes con síntomas compatibles y que tengan TEP
 - Identificar pacientes con síntomas compatibles y que NO tengan TEP

Múltiples estudios

- ❑ Angiografía Pulmonar
- ❑ Gases arteriales
- ❑ Electrocardiograma
- ❑ Radiografía de tórax
- ❑ Doppler Venoso
- ❑ Pletismografía
- ❑ Venografía
- ❑ Cintigrama V/Q
- ❑ AngioTAC
- ❑ Resonancia
- ❑ Dímero D

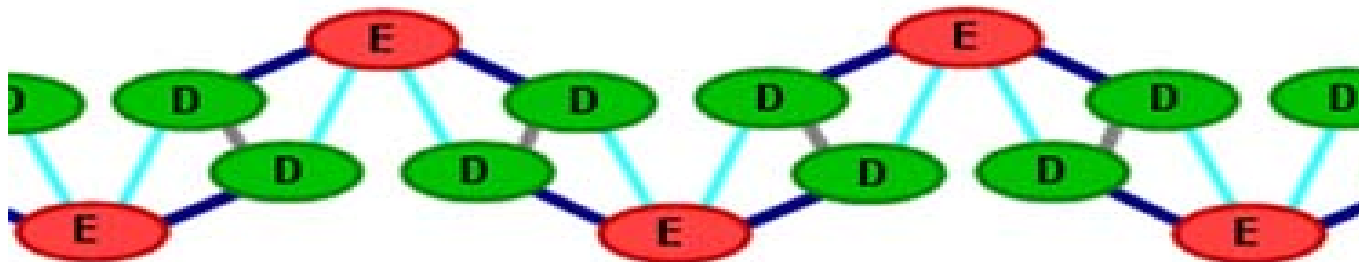
Dímero D

Schema der D-Dimer Bildung

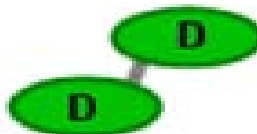
Fibrin-Einzelmolekül besteht aus einem E
und 2 D-Abschnitten:



Bei der Blutgerinnung verbinden sich viele
Fibrin-Einzelmoleküle zu einem Aggregat:



Bei der Auflösung des Gerinnsels entstehen
unter anderem D-Dimere:

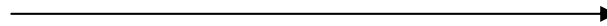


Dímero D

Fibrinolisis

Coagulo

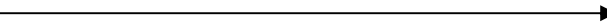
Fibrina



Fragmento DD/E,
YD/YD, YY/DXD, DD

Plasmina

Fibrinógeno



Fragmentos X, Y, D, E

Dímero D

- Test disponibles desde 1980
 - Aglutinación eritrocitos
 - Aglutinación látex cualitativo
 - Aglutinación látex cuantitativo
 - Turbidimétrico
 - Inmunofiltración
 - ELISA cualitativo
 - ELISA cuantitativo
 - ELISA semicuantitativo
 - ELISA rápido

Dímero D

□ Problemas

- Varios test
- Estandarización de test
- Disponibilidad
- Diferencias de sensibilidad y especificidad

Pulmonary Embolism

	Sensitivity (95% CL)	Specificity (95% CL)	Positive Likelihood Ratio (95% CL)	Negative Likelihood Ratio (95% CL)
Tier 1 analyst				
ELISA	0.95 (0.85–1.00)	0.44 (0.34–0.54)	1.68 (1.44–1.95)	0.13§ (0.03–0.58)
Quantitative rapid ELISA	0.95 (0.83–1.00)	0.39 (0.28–0.51)	1.56 (1.32–1.83)	0.13§ (0.02–0.84)
Semi- quantitative rapid ELISA	0.93 (0.79–1.00)	0.36 (0.23–0.50)	1.45 (1.20–1.76)	0.20§ (0.04–0.96)
Qualitative rapid ELISA	0.93 (0.74–1.00)	0.68 (0.50–0.87)	2.92 (1.77–4.79)	0.11§ (0.01–0.93)
Quantitative latex	0.89 (0.81–0.98)	0.45 (0.36–0.53)	1.62 (1.43–1.84)	0.24 (0.13–0.45)
Semi- quantitative latex	0.92 (0.79–1.00)	0.45 (0.31–0.59)	1.68 (1.35–2.09)	0.17§ (0.04–0.78)
Whole- blood	0.78 (0.64–0.92)	0.74 (0.60–0.88)	2.93 (1.89–4.52)	0.31 (0.18–0.51)
Tier 2 analysis**				
ELISA	0.96## (0.88–1.00)	0.51 (0.44–0.59)	1.97 (1.72–2.26)	0.08¶ (0.01–0.43)
Quantitative rapid ELISA	0.97## (0.87–1.00)	0.41 (0.30–0.51)	1.64 (1.40–1.91)	0.07¶ (0.00–1.55)
Semi- quantitative rapid ELISA	0.93 (0.79–1.00)	0.40 (0.27–0.54)	1.55 (1.25–1.93)	0.18§ (0.04–0.94)
Qualitative rapid ELISA	0.91 (0.68–1.00)	0.70## (0.47–0.93)	3.01 (1.52–5.96)	0.13§ (0.01–1.28)
Quantitative latex	0.89 (0.80–0.99)	0.47 (0.38–0.57)	1.69 (1.44–1.99)	0.23 (0.11–0.48)
Semi- quantitative latex	0.80 (0.65–0.94)	0.56 (0.42–0.70)	1.81 (1.35–2.42)	0.36 (0.20–0.67)
Whole- blood	0.83 (0.74–0.92)	0.64## (0.55–0.73)	2.32 (1.87–2.88)	0.27 (0.17–0.42)

Table 2. Outcome of Diagnostic Strategies for Excluding Pulmonary Embolism in All Referred Patients*

Exclusion Strategy	Study, Year (Reference)	Included Patients	VTE Complications†	Failure Rate (95% CI)
		n	%	%
Pulmonary angiography				
Normal results	FIOPED, 1990 (7)	480	4	0.8 (2.1)
Lung scintigraphy				
Normal results	Kruit et al., 1991 (71)	44	0	0 (8.0)
	van Beek et al., 1995 (75)	113	0	0 (3.2)
	Perrier et al., 1996 (15)	43	0	0 (8.2)
	van Beek et al., 1997 (73)	137	1	0.7 (4.0)
	de Groot et al., 1999 (77)	54	3	5.6 (15.4)
	Wron et al., 1999 (87)	16	0	0 (20.6)
	Miniati et al., 2001 (85)	34	0	0 (10.3)
	Total	441	4	0.9 (2.3)
Normal results plus normal results on leg testing‡	Hull et al., 1990 (70)	515	3	0.6 (1.7)
	Hull et al., 1994 (12)	576	4	0.7 (1.8)
	Wells et al., 1998 (13)	332	2	0.6 (2.2)
	Total	1423	9	0.6 (1.2)
Nondiagnostic results in patients with low clinical probability	Perrier et al., 1996 (15)	48	0	0 (7.4)
Nondiagnostic results in patients with normal D-dimer levels and moderate clinical probability	Perrier et al., 1996 (15)	53	0	0 (6.7)
D-Dimer testing alone or combined with clinical probability				
Normal D-dimer level	Perrier et al., 1999 (14)	159	0	0 (2.3)
	Bornier et al., 2001 (85)	42	0	0 (8.4)
	Total	201	0	0 (1.8)
Normal D-dimer level in patients with low clinical probability	Wells et al., 2001 (78)	437	1	0.2 (1.3)
	Anderson et al., 2001 (84)	306	1	0.3 (1.8)
	Krup et al., 2002 (83)	60	0	0 (6.0)
	ten Wolde et al., 2001 (81)	91	0	0 (4.0)
	Total	894	2	0.2 (0.8)
Normal D-dimer level in patients with low to moderate clinical probability	Leclercq et al., 2002 (82)	64	0	0 (5.6)
Spiral CT and CUS				
Normal results on both in patients with low to moderate clinical probability	Musset et al., 2002 (17)	507	9	1.8 (3.3)

Uso de Dímero D

- Actualmente validado
 - Siempre en relación a probabilidad clínica
 - Es un examen que ayuda a descartar la enfermedad, no a confirmarla
 - La técnica utilizada es relevante

Table 1.

Wells et al⁴¹ criteria for assessment of pretest probability for PE.

Criteria				Points
Suspected DVT				3.0
An alternative diagnosis is less likely than PE				3.0
Heart rate >100 beats/min				1.5
Immobilization or surgery in the previous 4 wk				1.5
Previous DVT/PE				1.5
Hemoptysis				1.0
Malignancy (on treatment, treated in the past 6 mo or palliative)				1.0

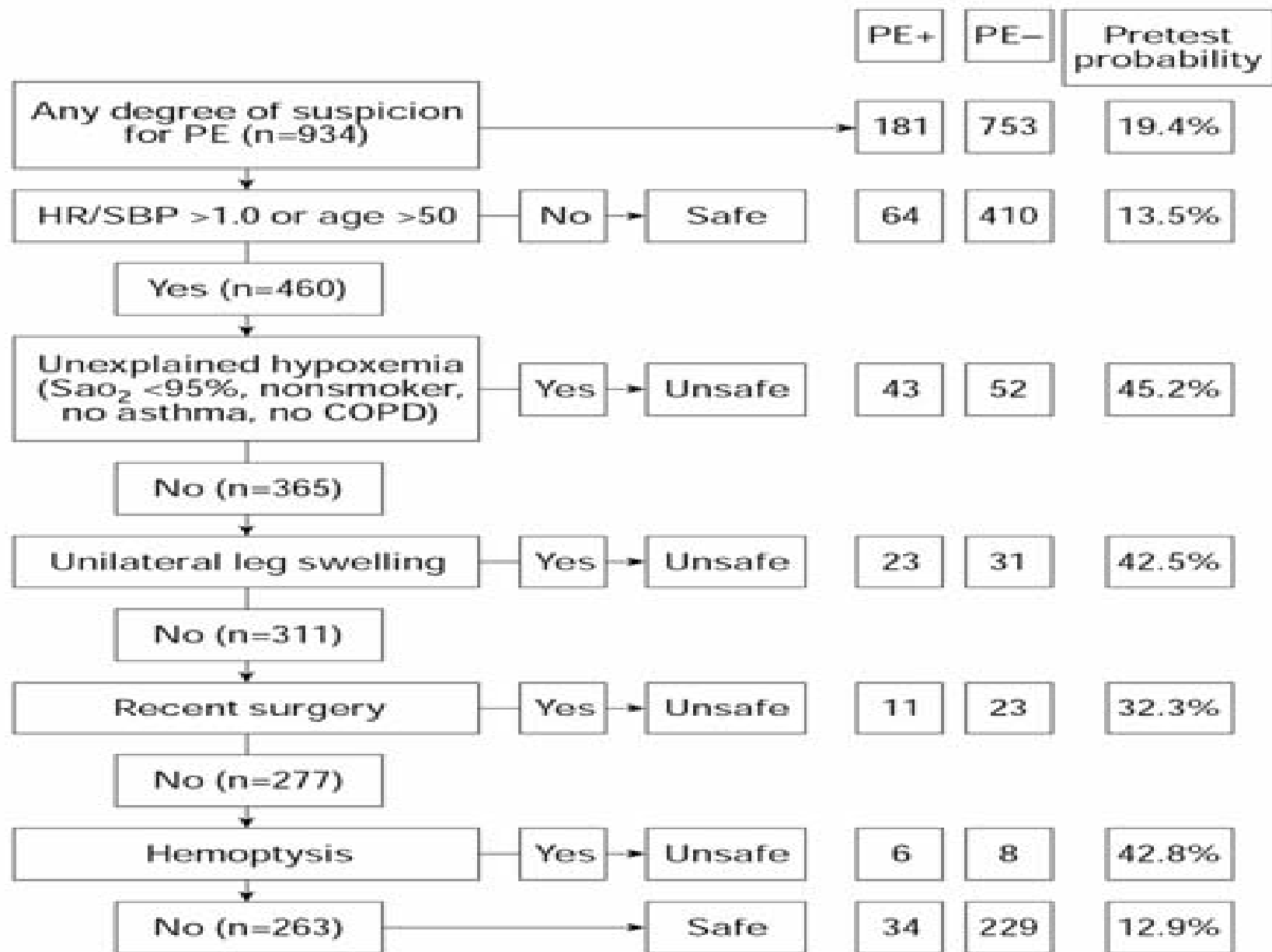
Score Range	Mean Probability of PE, %	% With This Score	Interpretation of Risk
<2 points	3.6	40	Low
2–6 points	20.5	53	Moderate
>6 points	66.7	7	High

Table 2.

*Wicki et al*⁴² criteria for assessment of pretest probability for PE.

Criteria	Points
Age 60–79, y	1
Age >79, y	2
Prior DVT/PE	2
Recent surgery	3
Heart rate >100 beats/min	1
Paco₂, mm Hg	
<36	2
36–39	1
Pao₂, mm Hg	
<49	4
49–60	3
>60–71	2
>71–82	1
Chest x-ray	
Plate-like atelectasis	1
Elevation of hemidiaphragm	1

Score Range	Mean Probability of PE, %	% With This Score	Interpretation of Risk
0–4	10	49	Low
5–8	38	44	Moderate
9–12	81	6	High



Overall pretest prevalence for safe patients = $(64 + 34) / (64 + 34 + 410 + 229) = 13.3\%$

¿ Sirve el Dímero D ?

- ❑ Sí, en la estrategia de descarte del TEP
- ❑ Sí, si el método utilizado es ELISA o turbodimétrico
- ❑ Sí, si la evaluación clínica del pre-test es adecuada

¿ Algún comentario ?

