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Pericarditis aguda asociada a elevación de marcadores miocárdicos

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Puntos clave

Definición

Incidencia

Factores causales

Marcadores clínicos asociados a miopericarditis

Pronóstico a corto y medio plazo

Síndromes miopericárdicos agudos

Perimiocarditis **Miopericarditis**

Miocarditis

Elevación de marcadores de necrosis miocárdica

Desarrollo de alteraciones contractilidad

Pericarditis

Dolor torácico pericardítico

Roce pericárdico

Alteraciones típicas ECG

Derrame *

Adaptado de Imazio et alt. Controversial Issues in the management of Pericardial diseases. Circulation. 2010:121:916-928.

Síndromes inflamatorios agudos miopericárdicos

Agente etiológico

↓

Respuesta inflamatoria

↓

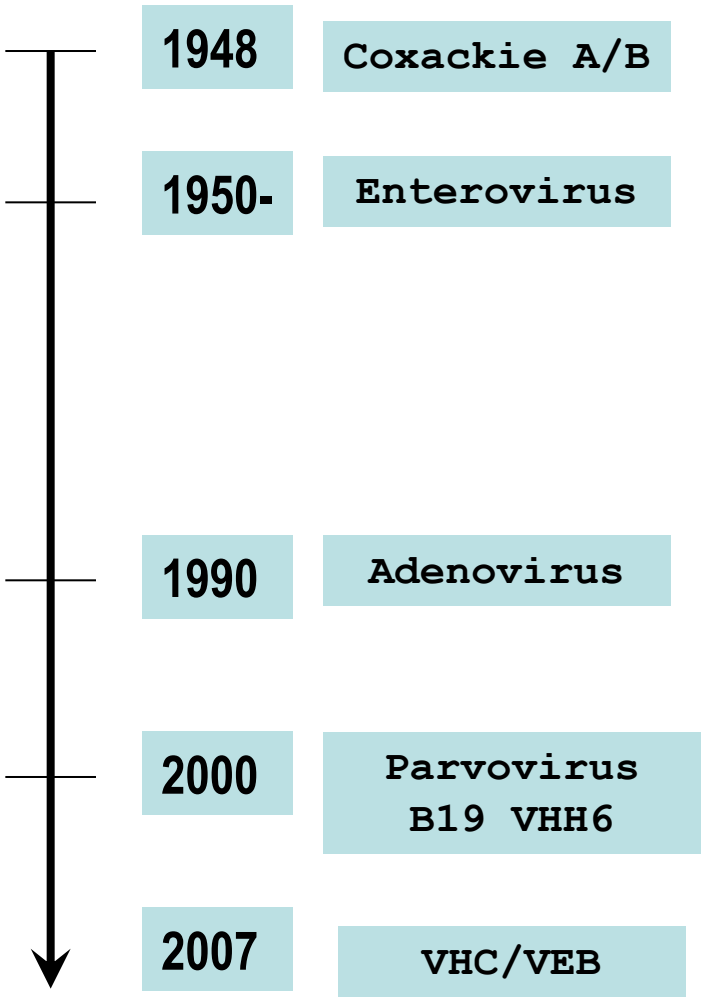
Manifestaciones clínicas múltiples

Imazio et al Controversial Issues in the management of Pericardial diseases. Circulation. 2010:121:916-928.

Agentes etilógicos de perimiocarditis

- ***Causas infecciosas***
  - **Viral** (mas común echovirus y coxackievirus frecuente influenza, EBV, CMV, adenovirus, varicella, rubeola, VHB, VHC, VIH, parvovirus B19 y herpervirus humano tipo 6)
  - Bacterias (TBC 4-5%, otros: coxiella, peumococcosis, menigococcosis, gonococcosis…)
  - Hongos (histoplasma, aspergilus,..) y parasitos (echinococo y toxoplasma).

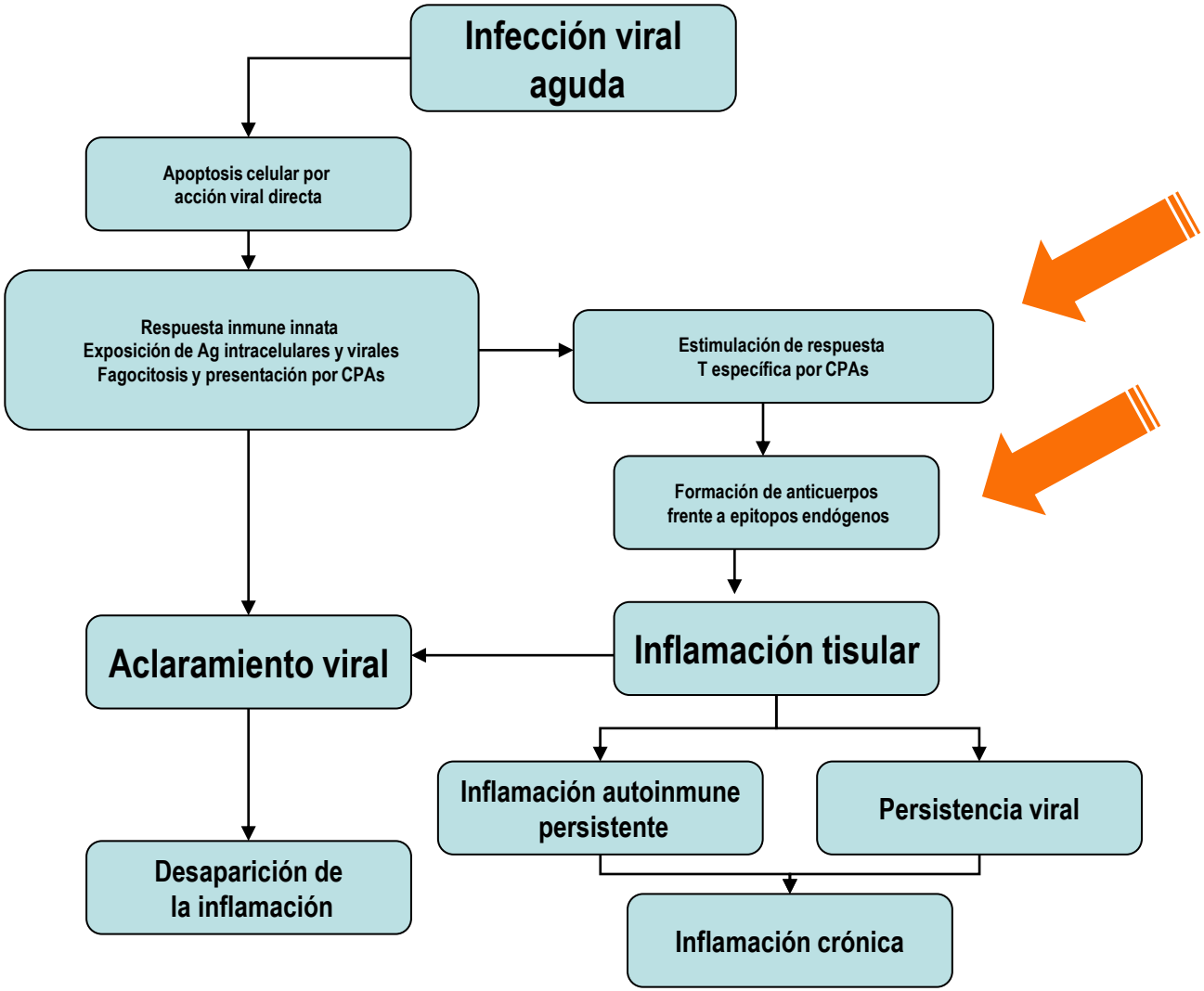
- ***Causas no infecciosas***
  - Autoinmunidad
    - Síndromes postlesión miopericárdica
    - Enfermedades autoinmunes primarias (LES, Sjögren, Artritis reumatoide).
  - Traumática
  - Metabólica
  - Secundarias al uso de fármacos.



Adaptado de Permanyer-Miralda G. Acute pericardial disease: approach to the aetiologic diagnosis. Heart. 2004: 252-254.

Adaptado de Schultz J et alt. Diagnosis and treatment of viral myocarditis. Mayo Clin Proc. 2009:84 (11):1001-1009.

Respuesta inflamatoria



Adaptado de Shauer et alt. Acute viral myocarditis: current concenpts in diagnosis and treatment. IMAJ 2013;15:180-185

Incidencia de perimiocarditis

	n	Sexo %V	Edad m+-ds	Incid. %mio+peri
Imazio M et alt 2001-2005(Italia)*1	274	58%	56+14	14.6%
Machado S et alt 2005-2007(Francia)	103	78%	42 [28.3+-51.3]	13.6%
Leitman L et alt 2008-2011 (Israel) *2	100	85%	38+-12	61%
Imazio el alt 2007-2011	486	61%	37.5+-19.9	23.4+5 %
Gamaz-Chulian el alt 2001-2011(España) *2	105	89%	36+-15	60.9%

*1.Datos poblacionales 27.7/100.000 hab (pericarditis que requiere de atención hospitalaria)

*2.Ingresos hospitalarios. Se incluyeron casos de miocarditis.

Factores causales para el desarrollo de afectación miocárdica

AGENTE PATÓGENO

Etiología	Pericarditis	Miocarditis	Perimiocarditis	Global
Idiopático	294(85%)	96 (84.2%)	22 (84.6%)	412 (84.8%)
Infeccioso	16 (4.6%)	5 (4.4%)	1 (3.9%)	22 (4.5%)
Enf. tejido con.	36(10.4%)	13 (11.4%)	3 (11.5%)	52 (10.7%)

La tasa de afectación miocárdica no difiere entre los diferentes tipos de agentes patógenos

Imazio et al. Good prognosis for pericarditis with or without myocardial involvement; results from a multicenter cohort study. Circulation 2013 Jul 2; 128 (1):42-9.

Marcadores clínicos asociados a desarrollo de miopericarditis

Parámetro	Myopericarditis n=40	Pericarditis n=234	p (valor)
Edad (m+-ds)	36.0 (14.7)	54.8 (18.3)	<0.001
Sexo varón	30 (75.0)	107 (45.7)	0.001
Sind. Febril	20 (50.0)	51 (21.8)	<0.001
Roce peric.	12 (30.0)	95 (40.6)	0.274
Elevación ST	36 (90.0)	164 (70.1)	0.018
Ev. atípica ECG	17 (42.5)	49 (20.9)	0.006
Arritmias	26 (65.0)	39(16.7)	<0.001
Fibril. auricular	1 (2.5)	18 (7.7)	0.38
Otra TSV	7(17.5)	21 (9.0)	0.175
Taqui. ventricular	16 (40.0)	0 (0.0)	<0.001
Bloqueo AV	2 (5.0)	0 (0.0)	0.013
Derrame pericárdico	15 (37.5)	141 860.3)	0.012
FE inferior 55%	29 (72.5)	38 (16.2)	<0.001

Parámetro	OR (IC 95%)	p (valor)
Arritmias	17.6 (5.7-45.1)	<0.001
Sexo varón	6.4 (2.5-18.4)	=0.001
Edad(<40)	6.1 (2.2-16.9)	=0.001
Elevación ST	5.4 (1.4-20.5)	=0.013
Sind. Febril	2.0 (1.1-7.7)	=0.044

Imazio et al. Myopericarditis versus viral or idiopathic acute pericarditis. Heart 2008;94:498-501.

Parámetro	Myopericarditis n=14	Pericarditis n=38	p (valor)
Edad (m[rango])	34.9[28.3-41.2]	46[40.7-51.3]	0.01
Sexo ratio	12/2	28/10	0.37
Dur. Hospital	5.8 [4.7-6.8]	4.9[2.8-7]	0.01
Elevación ST	9	12	0.03
PCR (pico)	38.1[7-69.2]	68[49.9-68.1]	0.01
Anomalia ETT			
Disfunción ventricular	3	0	NS
Derrame pericárdico	5	15	0.03

Machado S et al. Can troponin elevation predict worse prognosis in patients with acute pericarditis. Ann Cardio Angi 2010; 59(1):1-7.

Análisis de los marcadores clínicos

Parámetro	OR (IC 95%)	p (valor)
Arritmias	17.6 (5.7-45.1)	<0.001
Sexo varón	6.4 (2.5-18.4)	=0.001
Edad(<40)	6.1 (2.2-16.9)	=0.001
Elevación ST	5.4 (1.4-20.5)	=0.013
Sind. Febril	2.0 (1.1-7.7)	=0.044

Perfil epidemiológico diferenciado:
1. Susceptibilidad a agentes infecciosos
2. Diferencias en al modulación de respuesta inmune

Presentación clínica característica
1. Cambios secundarios a la presencia de necrosis miocárdica: elevación de ST en ECG y presencia de arritmias.

Variación de la tasa de afectación miocárdica dependiendo del agente viral causal (una incognita)

Myopericarditis Following Smallpox Vaccination Among Vaccinia-Naive US Military Personnel

Jeffrey S. Halsell, DO; James R. Riddle, DVM, MPH; J. Edwin Atwood, MD; Pierce Gardner, MD; Robert Shope, MD; Gregory A. Poland, MD; Gregory C. Gray, MD, MPH; Stephen Ostroff, MD; Robert E. Eckart, DO; Duane R. Hospenthal, MD, PhD; Roger L. Gibson, DVM, PhD; John D. Grabenstein, RPh, PhD; Mark K. Arness, MD, MTM&; David N. Tornberg, MD, MPH; and the Department of Defense Smallpox Vaccination Clinical Evaluation Team

[+] Author Affiliations

JAMA. 2003;289(24):3283-3289. doi:10.1001/jama.289.24.3283.

Todos los pacientes presentaron con un periodo de latencia similar y un patrón de afectación clínica común

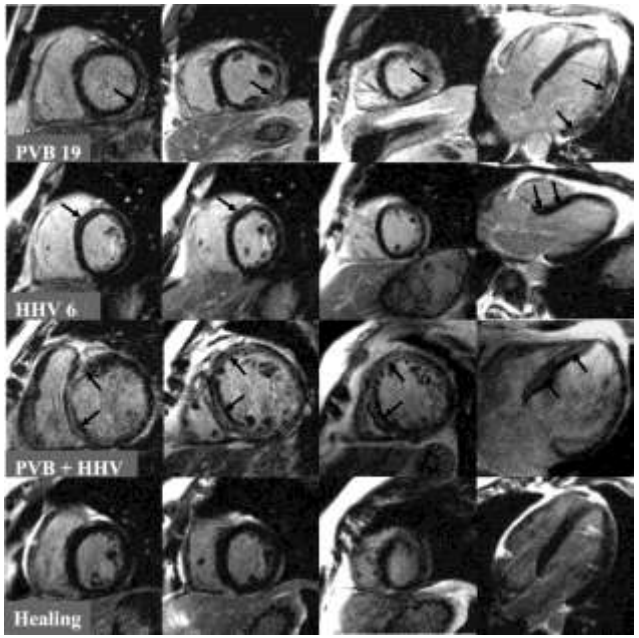
La incidencia de necrosis miocárdica fue muy elevada (60%)comparada con la distribución poblacional de estos síndromes

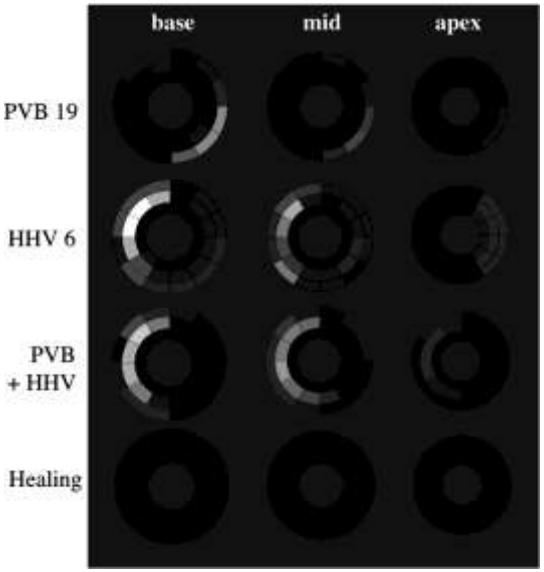
Results Among 230 734 primary vaccinees, 18 cases of probable myopericarditis after smallpox vaccination were reported (an incidence of 7.8 per 100 000 over 30 days). No cases of myopericarditis following smallpox vaccination were reported among 95 622 vaccinees who were previously vaccinated. All cases were white men aged 21 years to 33 years (mean age, 26.5 years), who presented with acute myopericarditis 7 to 19 days following vaccination. A causal relationship is supported by the close temporal clustering (7-19 days; mean, 10.5 days following vaccination), wide geographic and temporal distribution, occurrence in only primary vaccinees, and lack of evidence for alternative etiologies or other diseases associated with myopericarditis. Additional supporting evidence is the observation that the observed rate of myopericarditis among primary vaccinees is 3.6-fold (95% confidence interval, 3.33-4.11) higher than the expected rate among personnel who were not vaccinated. The background incidence of myopericarditis did not show statistical significance when stratified by age (20-34 years: 2.18 expected cases per 100 000; 95% confidence interval [CI], 1.90-2.34), race (whites: 1.82 per 100 000; 95% CI, 1.50-2.01), and sex (males: 2.28 per 100 000; 95% CI, 2.04-2.54).

Además... **estudios de cardioRM en miocarditis demuestran que la presentación clínica y patrón de afectación varían dependiendo del virus responsable de la necrosis miocárdica**

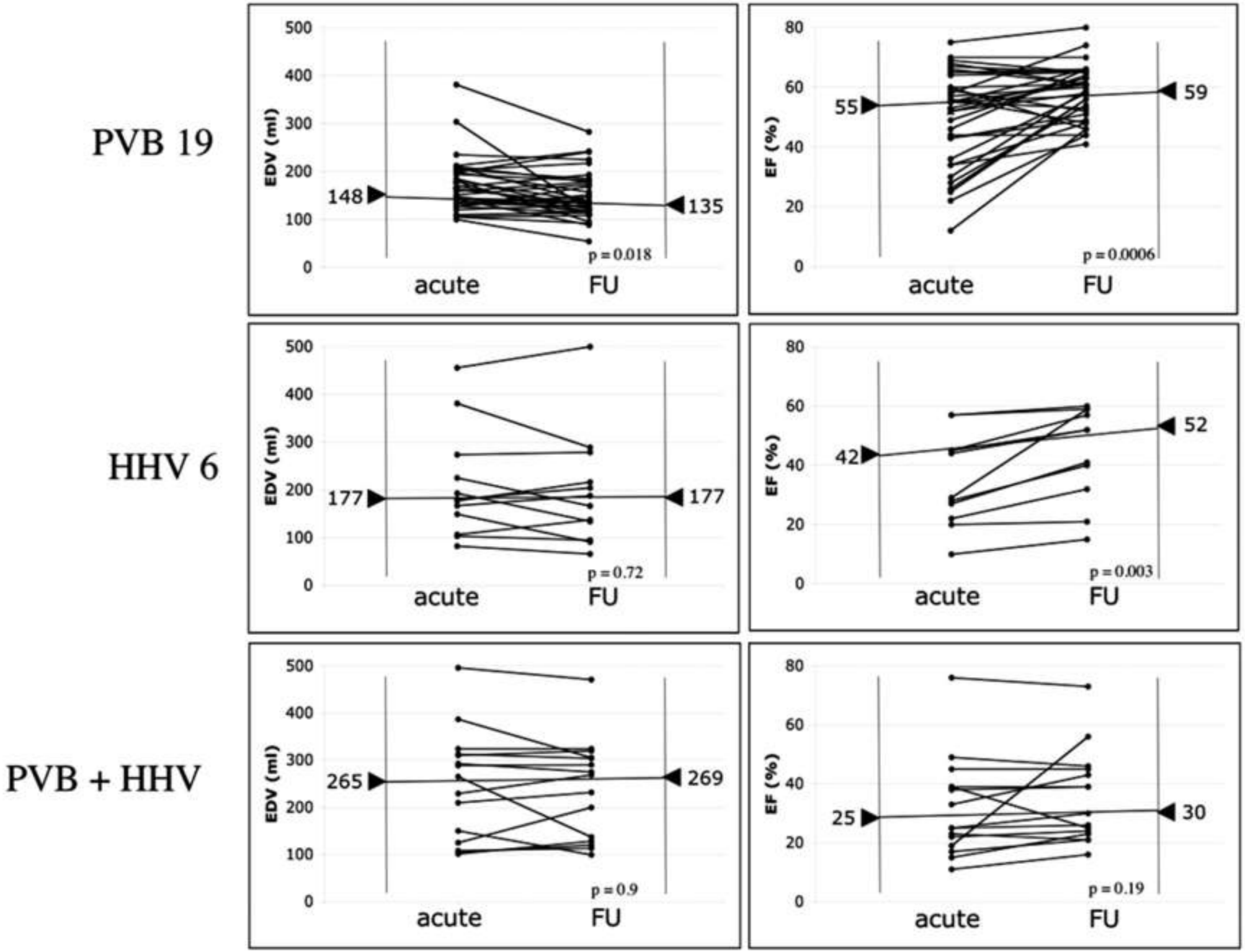
Presentation, Patterns of Myocardial Damage, and Clinical Course of Viral Myocarditis

Heiko Mahrholdt, MD; Anja Wagner, MD; Claudia C. Deluigi, MD; Eva Kispert, RN; Stefan Hager, MD; Gabriel Meinhardt, MD; Holger Vogelsberg, MD; Peter Fritz, MD; Juergen Dippon, PhD; C.-Thomas Bock, PhD; Karin Klingel, MD; Reinhard Kandolf, MD; Udo Sechtem, MD





Symptom Forcing Patient to Seek Medical Attention	*P*, PVB19 vs HHV6	*P*, PVB19 vs PVB+HHV	*P*, HHV6 vs PVB+HHV
Chest pain	<0.0001	<0.0001	0.23
Heart failure	<0.0001	<0.0001	0.27
Other	0.0005	0.002	1



PVB19, Parvovirus B19; HHV6, Human Herpes Virus 6; EF, ejection fraction; EDV, end diastolic volume; FU, follow-up

Susceptibilidad individual a la acción de virus cardiotropos (diferencias en la modulación de la respuesta inmune)

Prevalence of myocarditis and cardiotropic virus infection in Africans with HIV-associated cardiomyopathy, idiopathic dilated cardiomyopathy and heart transplant recipients: a pilot study

GASNAT SHABOODIEN, CHRISTOPHER MASKE, HELEN WAINWRIGHT, HEIDI SMUTS, MPIKO NTSEKHE, PATRICK J COMMERFORD, MOTASIM BADRI, BONGANI M MAYOSI

The presence of genomes of cardiotropic viruses was almost universal in African patients with HIV-associated cardiomyopathy, idiopathic dilated cardiomyopathy, and heart transplant recipients. Furthermore, we observed that participants who were immunosuppressed by HIV infection or on immunosuppressive treatment for heart transplantation had double the number of cardiotropic viruses per case, compared to those with idiopathic dilated cardiomyopathy (2.2–2.5 viruses per case compared to 1.1 virus per case).

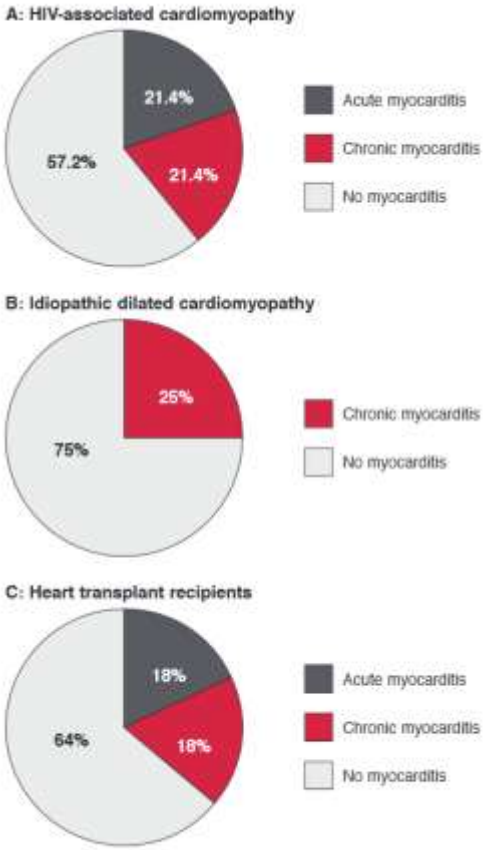
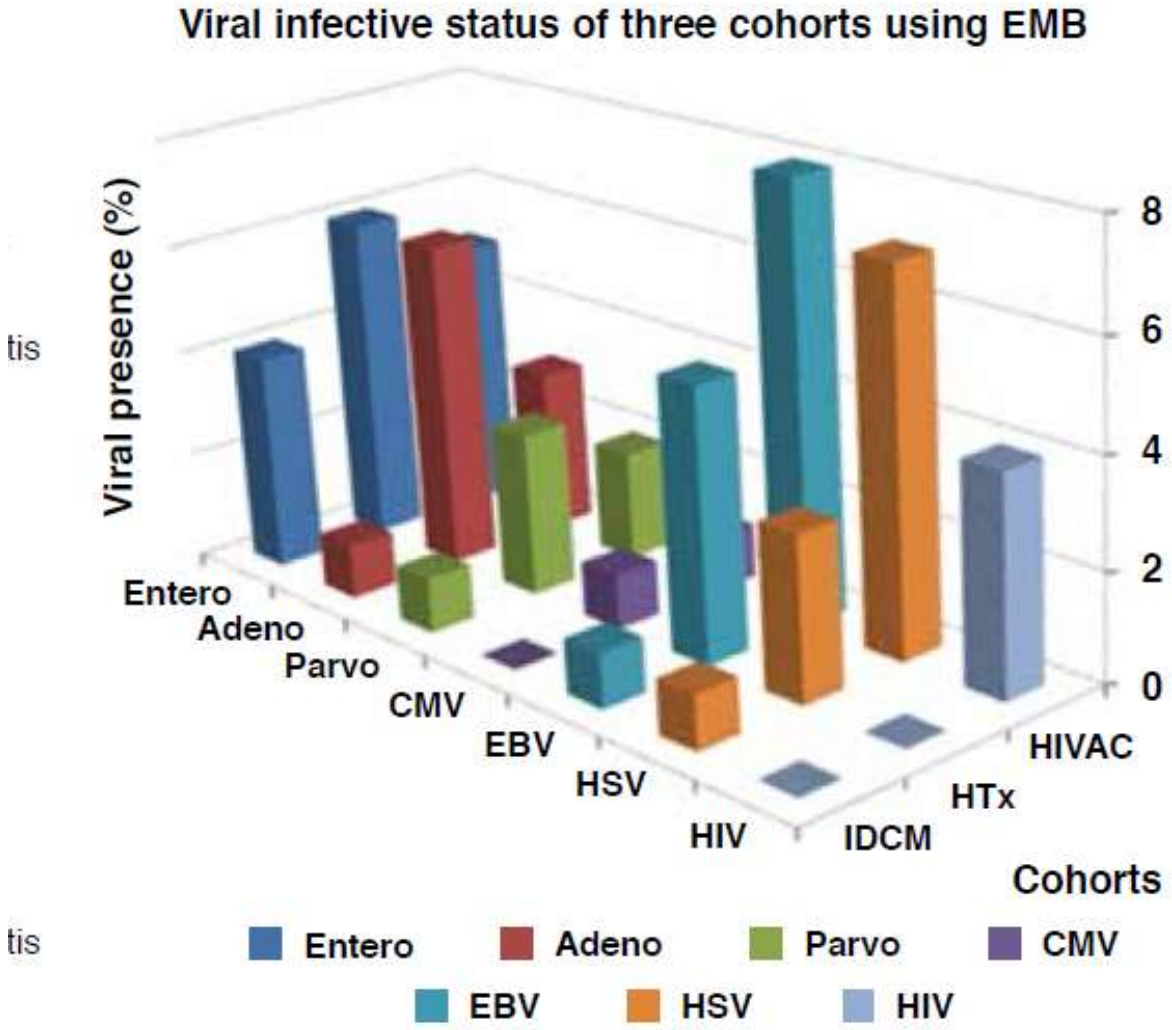


Fig. 1. Prevalence of myocarditis in HIV-associated cardiomyopathy (A), idiopathic dilated cardiomyopathy (B), and heart transplant recipients (C).


Viral infective status of three cohorts using EMB
Viral presence (%)
8
6
4
2
0
Entero
Adeno
Parvo
CMV
EBV
HSV
HIV
HIVAC
HTx
IDCM
Cohorts
Entero
Adeno
Parvo
CMV
EBV
HSV
HIV

Diagnóstico de la afectación miocárdica

Table 2 Diagnostic pathway and sequence of performance in acute pericarditis (level of evidence B for all procedures)

Technique	Characteristic findings	Reference
Obligatory (indication class I)		
Auscultation	Pericardial rub (mono-, bi-, or triphasic)	11
ECG[a]	*Stage I*: anterior and inferior concave ST segment elevation. PR segment deviations opposite to P polarity. *Early stage II*: ST junctions return to the baseline, PR deviated. *Late stage II*: T waves progressively flatten and invert *Stage III*: generalised T wave inversions *Stage IV*: ECG returns to prepericarditis state.	9
Echocardiography	Effusion types B-D (Horowitz) (Fig. 1)	12, 13
	Signs of tamponade (see Section 3.5)	
	(a) ESR, CRP, LDH, leukocytes (inflammation markers)	
	(b) Troponin I, CK-MB (markers of myocardial lesion)[b]	
Mandatory in tamponade (indication class I); optional in large/recurrent effusions or if previous tests inconclusive (indication class IIa) in small effusions (indication class IIb)		
Pericardiocentesis and drainage	PCR and histochemistry for aetiopathogenetic classification of infection or neoplasia	2, 10, 16
Optional or if previous tests inconclusive (indication class IIa)		
CT	Effusions, peri-, and epicardium	17
MRI	Effusions, peri-, and epicardium	17
Pericardioscopy, pericardial biopsy	Establishing the specific aetiology	2, 10, 18, 19

[a] Typical lead involvement: I, II, aVL, aVF, and V3-V6. The ST segment is always depressed in aVR, frequently in V1, and occasionally in V2. Occasionally, stage IV does not occur and there are permanent T wave inversions and flattenings. If ECG is first recorded in stage III, pericarditis cannot be differentiated by ECG from diffuse myocardial injury, "biventricular strain," or myocarditis. ECG in EARLY REPOLARIZATION is very similar to stage I. Unlike stage I, this ECG does not acutely evolve and J-point elevations are usually accompanied by a slur, oscillation, or notch at the end of the QRS just before and including the J point (best seen with tall R and T waves — large in early repolarisation pattern). Pericarditis is likely if in lead V6 the J point is >25% of the height of the T wave apex (using the PR segment as a baseline).

[b] Cardiac troponin I was detectable in 49% and >1.5 ng/ml in 22% of 69 patients with acute pericarditis (only in those with ST elevation in ECG) investigated by Bonnefoy et al.[20] In another study[21] troponin I was detected in 10/14 patients with a median peak concentration of 21.4 mg/ml (range 0.5 to >50 ng/ml). CK-MB was elevated in 8/14 patients with the median peak of 21 U/l (range 13–43), corresponding to the relative index of 10.2% of the total CK activity.

Guidelines on the diagnosis or management of pericardial diseases. Euro Heart J. 2004.

Uso de las técnicas de imagen

Acute pericarditis with small or no effusion (non-complicated course)	Class
TTE to confirm clinical diagnosis	Recommended
CMR to confirm clinical diagnosis if clinical context of myocarditis	Recommended
CT/CMR to confirm clinical diagnosis if echocardiography inconclusive	Not recommended
TOE if poor TTE quality of imaging	Not recommended
TTE for follow-up	Not recommended

European Association of Cardiovascular Imaging (EACVI) position paper: multimodality imaging in pericardial disease. Cosyns et alt. Euro Heart J. Cardiovasc. Imag. 2014: Sept.

Actitud terapeútica ante la afectación miocárdica

1.- Tratamiento de la pericarditis aguda

Siguiendo las pautas habituales para la enfermedad con AAS/ ibuprofeno y en casos seleccionados indometacina y colchicina.

2.- Ingreso y monitorización ECG.

Estos paciente presenta una incidencia más elevada de arritmias ventriculares malignas.

3.- Seguimiento ecocardiográfico

En ocasiones asocian alteraciones de la contractilidad segmentaria y disfunción ventricular lo que obligaría a añadir al tratamiento B-bloqueantes e IECAs.

Pronóstico clínico

	Dolor recurrente	Recurrencias	Taponamiento	Constricción	Disfunción ventricular residual	Mortalidad
Imazio et alt 2001- 2005 n= 274 (12 meses)	6(15.0)/28(12.0) p= 0.601(NS)	8(20.0)/47(20.1) p= 0.842(NS)	0(0.0)/7(3.0) p=0.570(NS	0(0.0)/3(1.3) p=0.927(NS)	1(2.5)/0(0.0) p= 0.315(NS)	0/0 NS
Machado S. et alt 2005-2007 n= 52 (36 meses)		3/14 vs 1/38 NS				1/14 vs 0/38 p=0.04
Imazio et alt 2007-2011 n= 486 (36 meses)		110(31.8)/12(10.5)/3 (11.5) p=0.001	8(2.3)/0(0.0)/0(0.0) NS	2(0.06)/1(0.9)/ 0(0.0) NS	4(1.1)/9(7.9)/4(15.4) p<0.001	0/0/0 NS
Gamaza-Chulian et alt 2001-2011 n= 105 (51 meses)		8 (19)/7 (11) NS	2(5)/1(2) NS	0/0 NS	61.9% vs 62.9% NS	0/0 NS


Buen pronóstico global
No diferencias significativas con los pacientes sin elevación de marcadores
Evitar técnicas agresivas
Seguimiento clínico estrecho
Pronóstico clínico

Conclusiones

- Los síndromes inflamatorios miopericárdicos presentan de forma global un buen pronóstico.

- La tasa de afectación miocárdica es equivalente entre los diferentes grupos causales (idiopática, vírica, autoinmune).

- Existen marcadores clínicos que predicen el desarrollo de afectación miocárdica como son la edad inferior a 40 años, sexo varón, la presencia de arritmias, la elevación del ST y la presencia de síndrome febril asociado.

- La elevación de Trop I no tiene valor pronóstico en este grupo de pacientes a diferencia del síndrome coronario agudo.

- La fracción de eyección disminuida en la fase aguda no tiene repercusión pronóstica a medio plazo si bien en algunas series predice el desarrollo de disfunción ventricular a medio plazo.

- La cardioRM es útil en estos pacientes porque confirma el diagnóstico y puede aportar información adicional de carácter pronóstico (especialmente paciente que presenta disfunción ventricular o alteraciones de la contractilidad segmentaria o en caso de incertidumbre diagnóstica).