Ecocardiografia 2015-XVII Congresso Nazionale SIEC
Napoli 16-18 Aprile 2015

How to: Counseling Cardiologico in Gravidanza

Cardiomiopatia del peripartum: up-date

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Ospedale S.Orsola-Malpighi - Università degli Studi di Bologna

…no single institution sees a large enough number of patients with peripartum cardiomyopathy to conduct any significant research on this entity

Veille and Zaccaro, Am J Obstet Gynecol 1999

…the practing cardiologist may see only a few cases during his or her career

Lampert and Lang, Am Heart J 1995

ORIGINAL ARTICLE

Heart failure in pregnant women with cardiac disease: data from the ROPAC

Titia P E Ruys,[1] Jolien W Roos-Hesselink,[1] Roger Hall,[2] Maria T Subirana-Domènech,[3] Jennifer Grando-Ting,[4] Mette Estensen,[5] Roberto Crepaz,[6] Vlasta Fesslova,[7] Michelle Gurvitz,[8] Julie De Backer,[9] Mark R Johnson,[10] Petronella G Pieper[11]

Heart failure

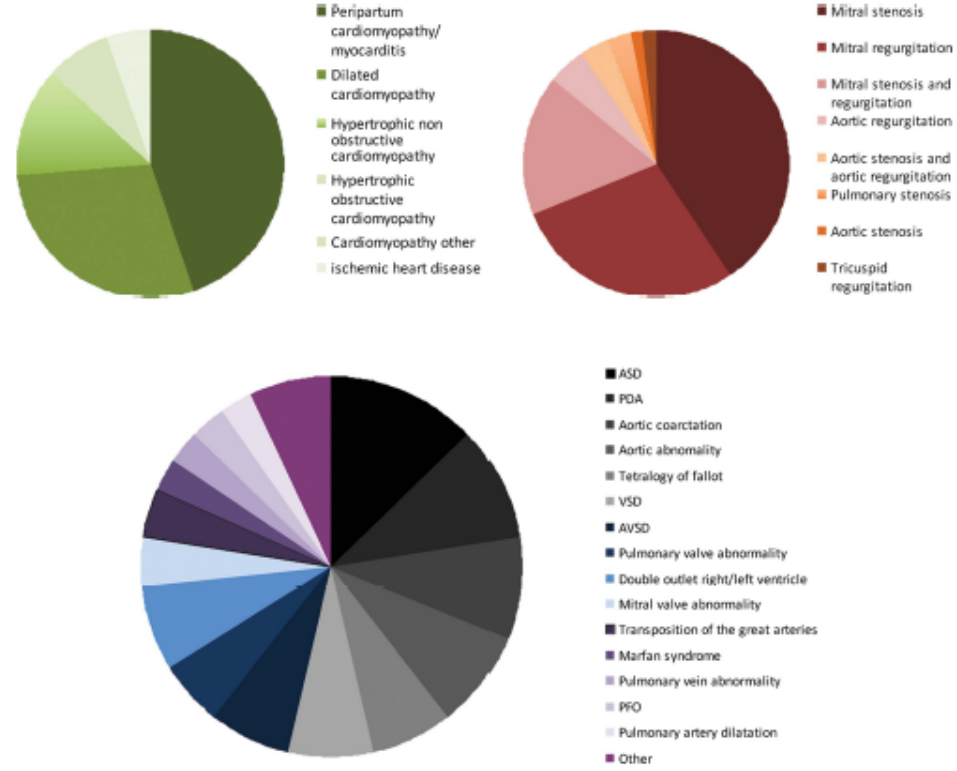

Figure 1 Diagnosis in patients with heart failure. In green shades, cardiomyopathy (n=36); in red shades, valvular heart disease (n=64); in other shades, congenital heart disease (n=71).

Ruys TPE, *et al*. *Heart* 2014;**100**:231–238. doi:10.1136/heartjnl-2013-304888

PERIPARTUM CARDIOMIOPATHY: HYSTORY

- *Ritchie C: Clinical contribution to the path-diagnosis and treatment of certain chronic disease of the heart. Edinburgh Med J, 1850; 2: 2*
- *Virchow R: Sitzing der Berliner Geburtshilflisher Gersellskhalt, cited by Porak C: De l'influence réciproque de la grossesse et des maladies du Coeur thesis. Paris 1880*
- *Gouley BA,McMillan TM, Bellet S: Idiopatic myocardial degeneration associated with pregnancy and especially the puerperium. Am J Med Sci 1937; 19: 185-99*
- *Hull E, Hafkespring E: Toxic postpartal heart disease. New Orleans Med Surgery J 1937; 98: 550-557*
- *Hull E, Hidden E: Postpartal heart failure. South Med J 1938; 31: 265-70*

PERIPARTUM CARDIOMIOPATHY: TERMS HYSTORY

- Toxic pospartal heart failure
- Postpartum heart disease
- Postpartum myocardosis
- Meadows' syndrome
- Idiopathic myocardial degeneration associated with pregnancy
- Zaria syndrome
- Postpartum cardiomyopathy

Abboud J et al, Intern J Cardiol 2007

PERIPARTUM CARDIOMIOPATHY: DEFINITION

Table 1 Definition of peripartum cardiomyopathy

Source	Year	Definition
Demakis *et al*[w15]	1971	► Development of cardiac failure in the last month of pregnancy or within 5 months of delivery ► Absence of a determinable aetiology for the cardiac failure ► Absence of demonstrable heart disease before the last month of pregnancy
National Heart, Lung, and Blood Institute and the Office of Rare Diseases of the National Institutes of Health Workshop on Peripartum Cardiomyopathy[1]	2000	► Development of cardiac failure in the last month of pregnancy or within 5 months of delivery ► Absence of an identifiable cause for the cardiac failure ► Absence of recognisable heart disease before the last month of pregnancy ► LV systolic dysfunction demonstrated by classical echocardiographic criteria: ejection fraction <45% or fractional shortening <30%, or both

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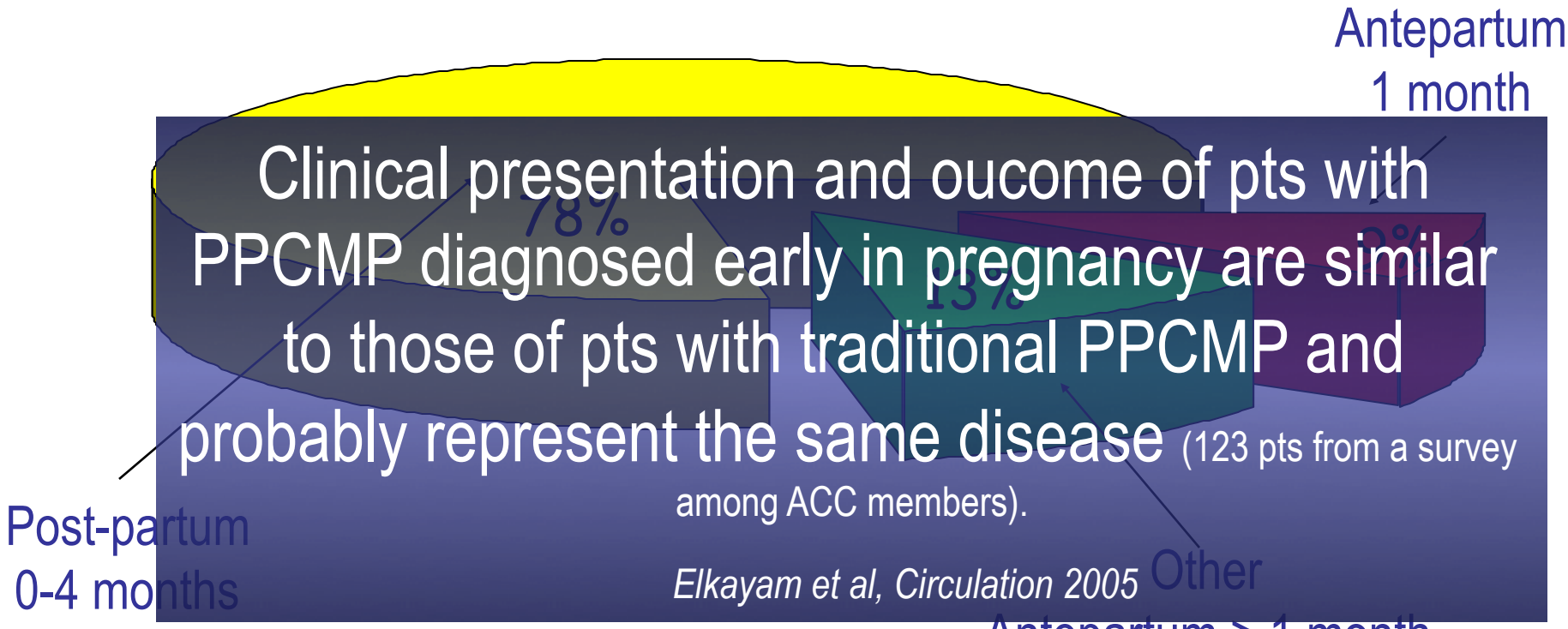
ONSET OF PPCMP IN A POOL OF 13 STUDIES BASED ON 419 CASES



Clinical presentation and oucome of pts with PPCMP diagnosed early in pregnancy are similar to those of pts with traditional PPCMP and probably represent the same disease (123 pts from a survey among ACC members).

Elkayam et al, Circulation 2005

From Lamper MB & Lang RM, Am Heart J 1995

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American Heart Association Scientific Statement on contemporary definitions and classifications of the cardiomyopathies[w16]	2006	Peripartum (postpartum) cardiomyopathy is a rare and dilated form associated with LV systolic dysfunction and heart failure of unknown cause that manifests clinically in the third trimester of pregnancy or the first 5 months postpartum and requires a high index of suspicion for diagnosis

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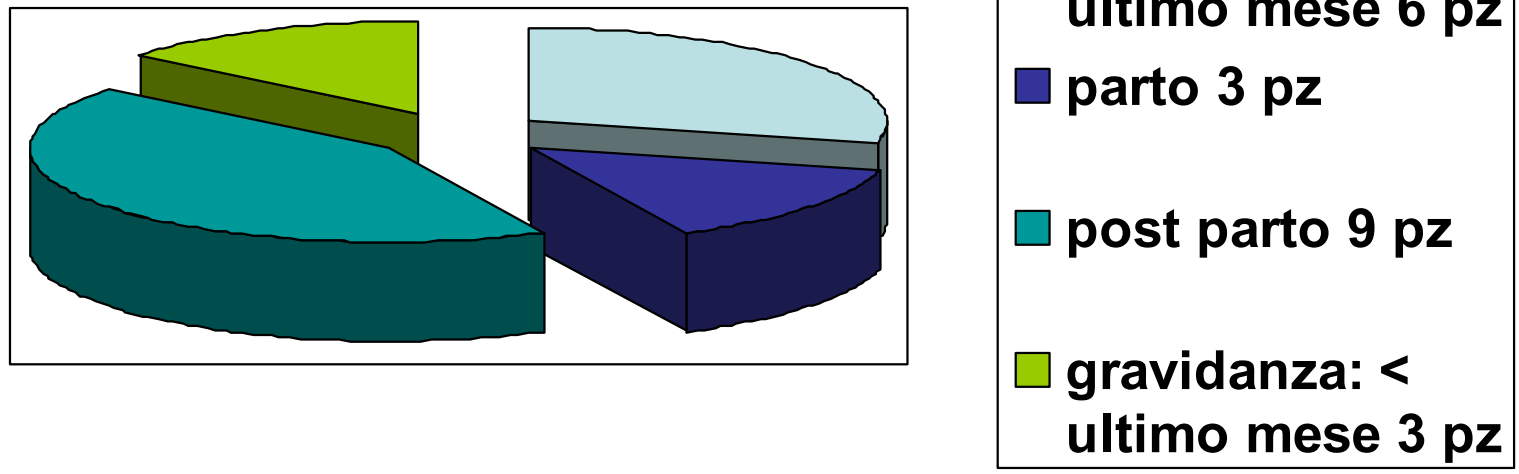
Heart Failure Association of the European Society of Cardiology Working Group on PPCM 2010[2]	2010	PPCM is an idiopathic cardiomyopathy presenting with heart failure secondary to LV systolic dysfunction towards the end of pregnancy or in the months following delivery, where no other cause of heart failure is found. It is a diagnosis of exclusion. The left ventricle may not be dilated but the ejection fraction is nearly always reduced below 45%

PPCMP: esordio dei sintomi/alterazioni eco nella casistica Emilia Romagna-S.Orsola-Malpighi



CARDIOMIOPATIA PERIPARTUM : caso clinico

- *38 anni, 2° gravidanza (nessun problema alla 1° gravidanza, parto cesareo x presentazione podalica), familiarità x CI*
- *12° settimana di gestazione: …*
- *37° settimana di gestazione:*
  - *moderata astenia, riduzione tolleranza allo sforzo, NYHA II*
  - *Ecocardiogramma: DTDVsn 65 mm, DTSVsn 56 mm, VTDVsn 223.6 ml, VTSVsn 153.6 ml, AF 15%, FE 32%, aspetto globoso del Vsn, IM L/M*
- *38° settimana di gestazione: parto cesareo, M 3.920 g, senza segni di sofferenza fetale*
- *Dopo il parto: benessere soggettivo, allattamento al seno*
- *2 mesi dopo il parto:*
  - *dispnea x sforzi lievi, ortopnea, astenia marcata, notevole limitazione dell'attività fisica, classe NYHA III*
  - *FC 120b/min, T3, soffio olosistolico 3/6 L, ECG tachicardia sinusale, BBsn completo*
  - *Ecocardiogramma: DTDVsn 68 mm, AF 15%, FE 32%, IM severa, IT lieve, PVdx 35 mmHg, pattern di riempimento ventricolare restrittivo*

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  - *Ricovero ospedaliero: valutazione emodinamica/coronarografia: CMPD, coronarie indenni*
  - *Inizia tp con ACE-I, beta-bloccante, diuretico e digitale*
- *successivi controlli: progressivo miglioramento clinico/strumentale*
- *20 mesi dopo il parto: asintomatica, ECG: BBsn, Ecocardio: DTDVsn 55 mm, AF 25%, FE 48%, IM moderata, IT minima, PVdx normale, Tp: betabloccante e ARB*

CARDIOMIOPATIA PERIPARTUM : caso clinico

- *38 anni, 2° gravidanza (nessun problema alla 1° gravidanza, parto cesareo x presentazione podalica), familiarità x CI*
- *12° settimana di gestazione: riscontro occasionale di BBsn all'ECG*
- *Asintomatica, h 165 cm, peso 70 Kg, PA 120/70, lieve anemia siderocarenziale*
- *Ecocardiogramma: DTDVsn 54 mm, DTSVsn 41 mm, VTDVsn 141.3 ml, VTSVsn 74.2 ml, AF 24%, FE 48%, aspetto tendenzialmente globoso del Vsn, Asn 43 mm, IM L/M*
- *Prescritto ASA 100 mg*
- *Controlli clinici mensili, controlli ecocardiografici bimestrali*
- *Stabilità clinica e normali parametri ostetrici (indici di resistenze vascolari alla flussimetria delle arterie uterine e indici di accrescimento fetale)*
- *Progressivo peggioramento degli aspetti strutturali e funzionali del Vsn all'ecocardiogramma*

INCIDENCE OF PPCMP

Blauwet LA & Cooper LT, Heart 2011

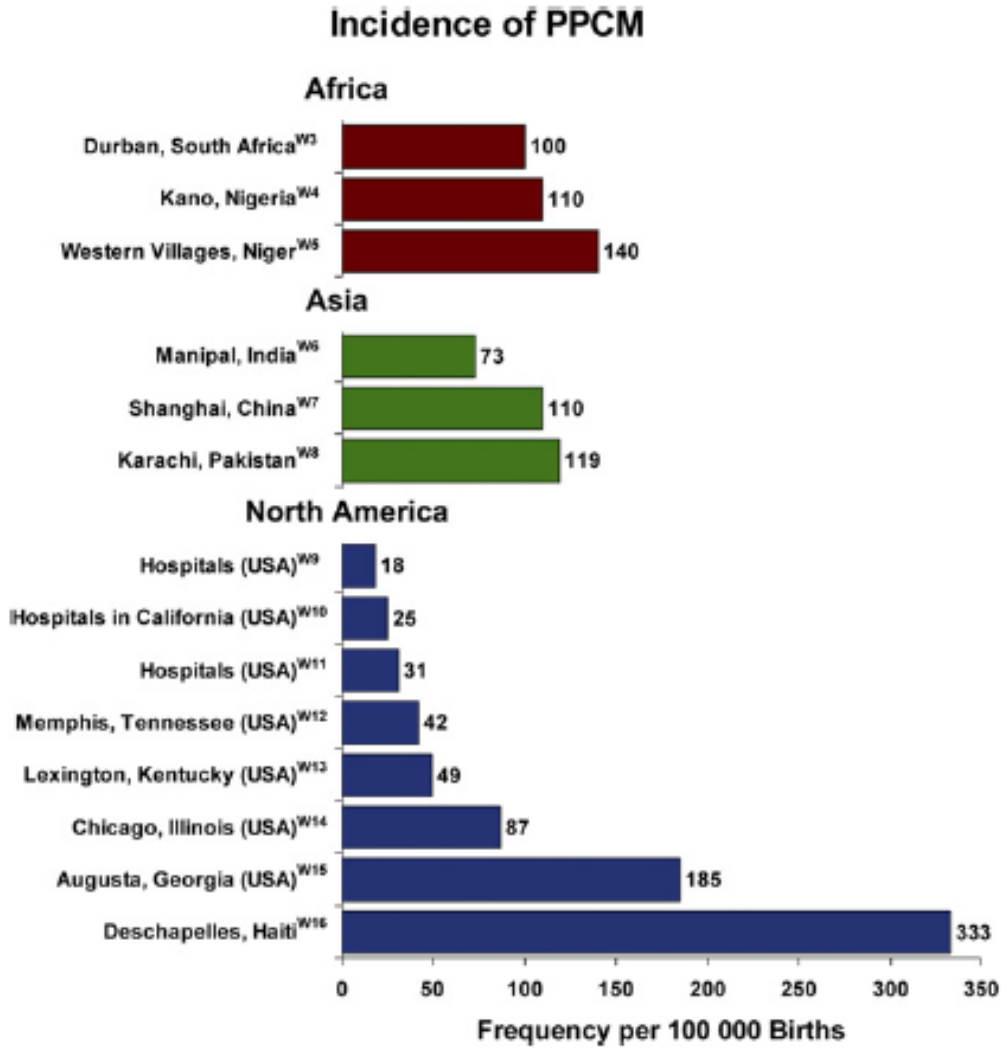


Figure 1 The reported incidence of peripartum cardiomyopathy (PPCM) in the USA varies considerably, while the reported incidences in several African and Asian countries are similar. Alfred Schweitzer Hospital in Haiti has reported the highest incidence of PPCM.

PERIPARTUM CARDIOMYOPATHY: EPIDEMIOLOGY

Incidence (marked geographical and ethnic variation in the incidence of PPCMP)

- It is not known (no population-based estimates)
- Presumably: 1/3000 - 1/4000 live births (1/1485-1/15.000)
- Black women > White women (15:1)
- **Greater risk:** Black african population (1/100 in the Nigerian Hausa tribe - ingestion of kanwa)

National Heart, Lung, Blood Institute and Office of Rare Diseases Workshop on PPCMP, JAMA 2000

Fattori di rischio ed etiologia della PPCMP

Blauwet LA & Cooper LT, Heart 2011

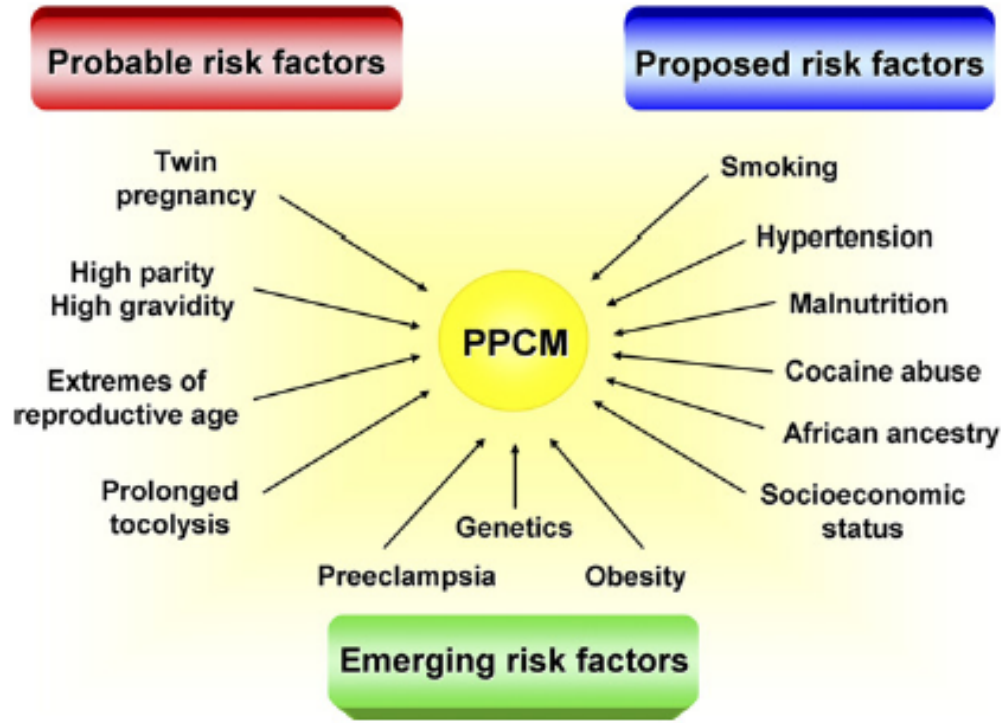


Figure 2 There are several probable risk factors for peripartum cardiomyopathy (PPCM), all of which are pregnancy related, that have been validated in multiple studies. A number of potential risk factors have historically been put forward, but remain controversial. Pre-eclampsia, obesity, and genetics have emerged as potentially strong risk factors.

Fattori di rischio ed etiologia della PPCMP

Fattori di rischio

- **Multiparità**
- **Gravidanza gemellare (13%)**
- **Maggiore prevalenza nella razza africana (associazione razziale o maggiore frequenza nei ceti meno abbienti?)**
- **PIH, PE (43%)**
- **Familiarità**

Etiopatogenesi

- **Ipotesi immunogenetica (sostenuta anche dall'esordio prevalente nell'immediato postparto)**
- **Deficit nutrizionali (selenio, calcio)**
- **Infezioni virali**
- **Ingestione di Kanwa ed esposizione a fango caldo-umido delle donne nigeriane (carico salino, ipertensione…)**
- **Risposta maladattativa allo stress emodinamico della gravidanza (aspetti fisiopatologici comuni: squilibrio angiogenico, stress ossidativo…prolattina)**
- **Forme fruste di predisposizione genetica alla CMPDI**
- **Trasmissibilità con l'embrione (un caso di PPCMP in "utero in affitto" x embrione di donna con pregressa PPCMP, un caso di HF in primigravida attempata da donazione di ovocita/embrione)**

Peripartum cardiomyopathy, an autoimmune manifestation of allograft rejection?

Norbert Gleicher [a,b,*], Uri Elkayam [c]

[a] From the Center for Human Reproduction and the Foundation for Reproductive Medicine, New York, NY, United States
[b] Department of Obstetrics, Gynecology and Reproductive Sciences, Yale University School of Medicine, New Haven, CT, United States
[c] Department of Medicine, Division of Cardiology Heart Failure Program and the Department of Obstetrics and Gynecology, University of Southern California, Keck School of Medicine, United States

Take-home messages

- There is convincing circumstantial evidence in support of abnormal autoimmune function as an underlying pathophysiologic mechanism in the development of PPCM.
- It is, however, tempting to speculate further that these observed autoimmune responses are not representative of an autoimmune condition, but reflect the typical[ly] autoimmune components of malfu[nction] this case pregnancy-[induced]
- Building on this [knowledge] which have been [developed] complications, may [be] times life-threateni[ng]

An improved understanding of the pathophysiological pathway leading to PPCM may result in the development of novel disease-modifying therapies for this condition

Autoimmunity Reviews 8 (2009) 384–387

PERIPARTUM CARDIOMYOPATHY

diversi tipi di malattia considerati nella PPCMP

- CMP preesistente e slatentizzata dal carico emodinamico della gravidanza
- Abitudini alimentari particolari: carenze alimentari, sovraccarico salino
- Miocardite (associazione con patologie autoimmuni)
- (Prolattina)

…rimane un gruppo eterogeneo con aspetti molto vari dal punto di vista epidemiologico nonostante i tentativi di restringere i criteri diagnostici…

PERIPARTUM CARDIOMIOPATHY: casistica Emilia Romagna-S.Orsola-Malpighi

id	età	Esordio sintomi	n. grav.	FE % esordio	FE % 6 m	NYHA esordio	NYHA 6 m	PIH/ PE	Tp 6 m
DS	38	37 sett *	2	48 poi 32	48	III poi IV	I	No	Si (cmpd,coro ok)
LIT(as)	31	Parto *	1	na	61	IV	I	PE	No (PE)
MS	31	Parto *	1	15	62	IV	I	No	Si (shock allerg.)
CB	31	2 sett post *	2	18	tx	IV	tx	No	Tx
BC	36	2 sett post *	1	35	65	IV	II	?	Si (tiroidite)
BC	40	7 m eco peg.	2	54 poi 47	52	II	II	No	Si (distiroidismo)
CR	27	2 sett post *	1	40	64	IV	I	No	Si (miocardite LES)
CR	28	33 set Vsn↑, IM	2	64	58	II	II	No	Si (IM m/s)
MJM	35	5 sett post FE↓	1	58	?	I	I	PE	No (PE)
CBr	33	1° trim, 36° sett bbsn	1	58	45	III	I	No	Si (tiroidite/non compatt.)
RA	36	31° sett eco	1	44	?	I	?	No	No (tiroidite, diabete gest.)
PA	33	35 sett	1	55	40	IV	I	No	Si (coronarie ok)
CM	38	36 sett *	1	40	50	IV	I	IC	Si
FM	36	32 sett	1	?	30	?	III	IC	Si
BP	36	1 sett post	2	40	55	II	I	?	Si
FJ (af)	44	3 m post	5	15	20	II	II	?	si
BD	30	1 m post *	1 (gem)	43	45	IV	I	PE	Si (PE fam cmp)

* Ricovero in TI/rianimazione

POSSIBLE CAUSES OF LV DYSFUNCTION OR HEART FAILURE CONFOUNDING THE DIAGNOSIS OF PPCMP IN PREGNANCY

General

- Chronic HBP heart disease
- Congenital heart disease
- Rheumatic heart disease
- Pulmonary disease
- Thromboembolism
- Sepsis

Obstetric

- Preeclampsia
- Excess administration of tocolytic agents
- Fluid overload after steroid use
- Amniotic fluid embolism

Because many of the signs and symptoms are similar to those of normal pregnancy and early postpartum period, the diagnosis of PPCMP can easily be missed

Diagnosis remains a challenge

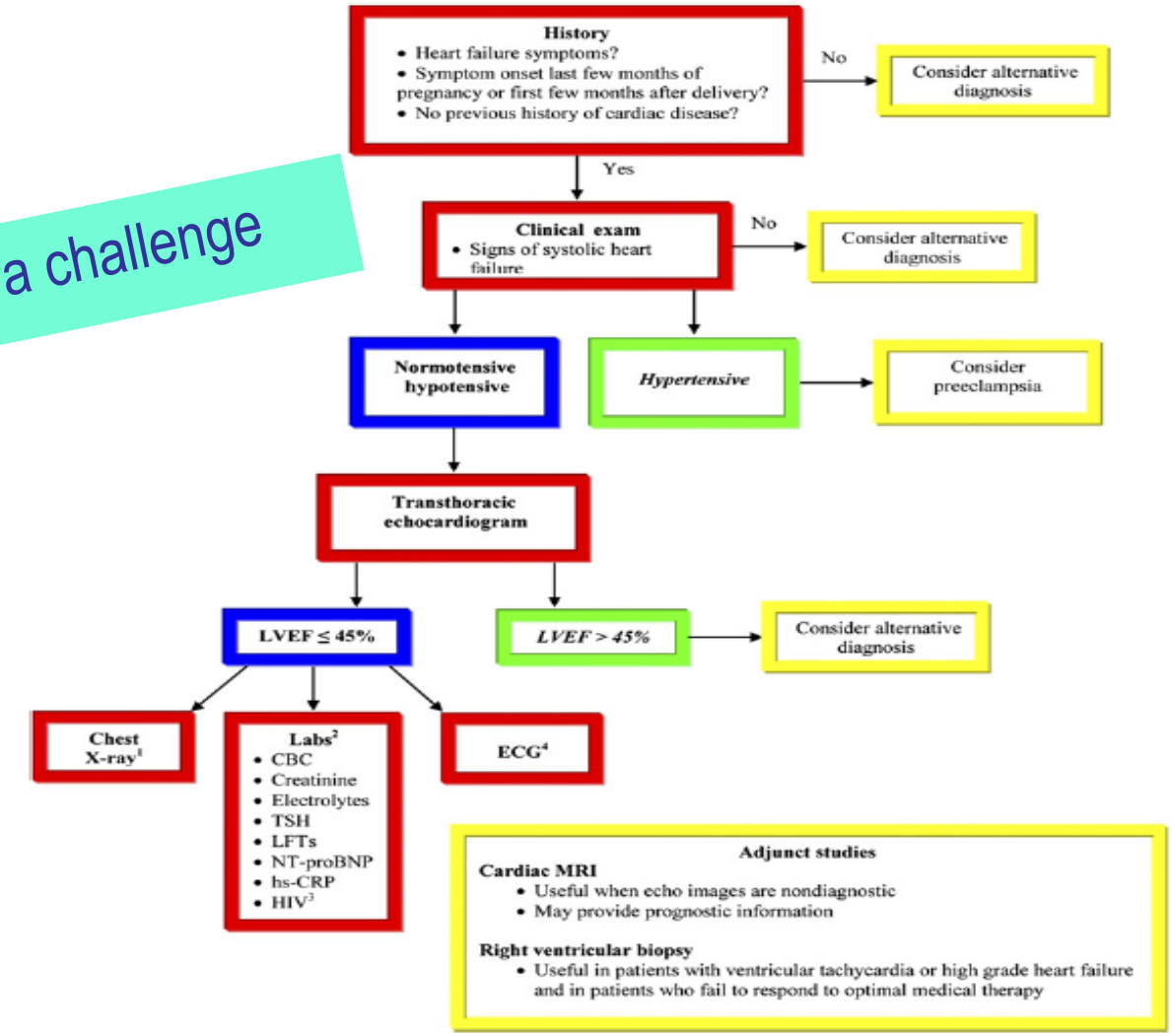


Figure 4 Diagnostic algorithm for peripartum cardiomyopathy. [1]Useful for assessing other possible aetiologies for symptoms including pneumonia and pneumothorax. [2]Useful for assessing other possible aetiologies for symptoms including severe anaemia, thyroid disease, liver disease, end stage renal disease, and infection. [3]Obtain in select cases. [4]Useful for assessing other possible aetiologies, including coronary artery dissection or thrombosis, and may provide prognostic information. CBC, complete blood count; hs-CRP, high sensitivity C reactive protein; LFTs, liver function tests; LVEF, left ventricular ejection fraction; NT-proBNP, N-terminal pro B-type natriuretic peptide; TSH, thyroid stimulating hormone.

Heart 2011;**97**:1970—1981. doi:10.1136/heartjnl-2011-300349

PERIPARTUM CARDIOMIOPATHY: TREATMENT

- PRE-PARTUM
  - Early delivery
  - Digoxin
  - Vasodilators (Hydralazine)
  - Diuretics
  - CCB (if hypertension)
  - ß-blockers (if necessary, low fetal growth)
  - Anthycoagulants (heparin)
- POST-PARTUM
  - Digoxin
  - Diuretics
  - Vasodilators
  - **Ace-I/ARBs/renin-I**
  - CCB (if hypertension)
  - ß-blockers
  - Anthycoagulants (warfarin)

Excretion of drugs and metabolytes during breast feeding

PERIPARTUM CARDIOMIOPATHY: TREATMENT

– ADDITIONAL TREATMENTS

Experimenta therapy:

- Immunosuppressive therapy
  - Limited to myocarditis (biopsy) and not improved after 2 weeks of treatment
- Intravenous immunoglobilin
- Pentoxifylline
- Bromocriptine

Implantable cardioverter-defibrillator

Cardiac assist devices

Cardiac transplantation

- Survival (?)
  - » = Other CMP (Keogh, 1994)
  - » Reduced survival
- Early rejection

PERIPARTUM CARDIOMIOPATHY: DIFFERENCES WITH IDMP

- Younger age
- **Better prognosis**
- Higher incidence
- Mostly postpartum (IDCMP usually manifests by the 2° trimester)
- Exclusively pregnant women or peripartum period
- Varying types of hemodynamic patterns
- Unique sets of antigenes and antibodies against myocardium
- Higher incidence of myocarditis
- **Heart size returns to normal after delivery in a greater percentage of pts**
- More rapid worsening of clinical conditions

Pradipta Bhakta et al, Yonsei Med J 2007

Published in final edited form as:
J Card Fail. 2012 January ; 18(1): 28–33. doi:10.1016/j.cardfail.2011.09.009.

Myocardial Recovery in Peripartum Cardiomyopathy: Prospective Comparison with Recent Onset Cardiomyopathy in Men and Non-Peripartum Women

Leslie T. Cooper, MD[1], Paul J. Mather, MD[2], Jeffrey D. Alexis, MD[3], Daniel F. Pauly, MD, PhD[4], Guillermo Torre-Amione, MD, PhD[5], Ilan S. Wittstein, MD[6], G. William Dec, MD[7], Mark Zucker, MD[8], Jagat Narula, MD,PhD[9], Kevin Kip, PhD[10], and Dennis M. McNamara, MD,MS[11] for the IMAC2 Investigators

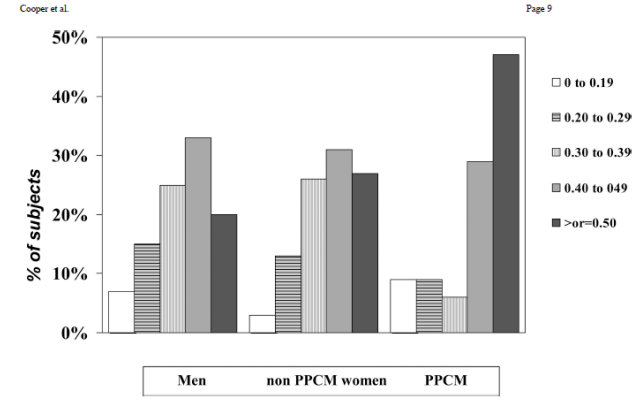


Figure 2. Distribution of values for LVEF and 6 months by Group: Men, non-PPCM Women, and PPCM
Percent of subjects with LVEF≥0.50 greatest in PPCM (p=0.002). However similar percentage in all groups with LVEF less than 0.30 at 6 months.

PERIPARTUM CARDIOMIOPATHY

…identità nosografica distinta

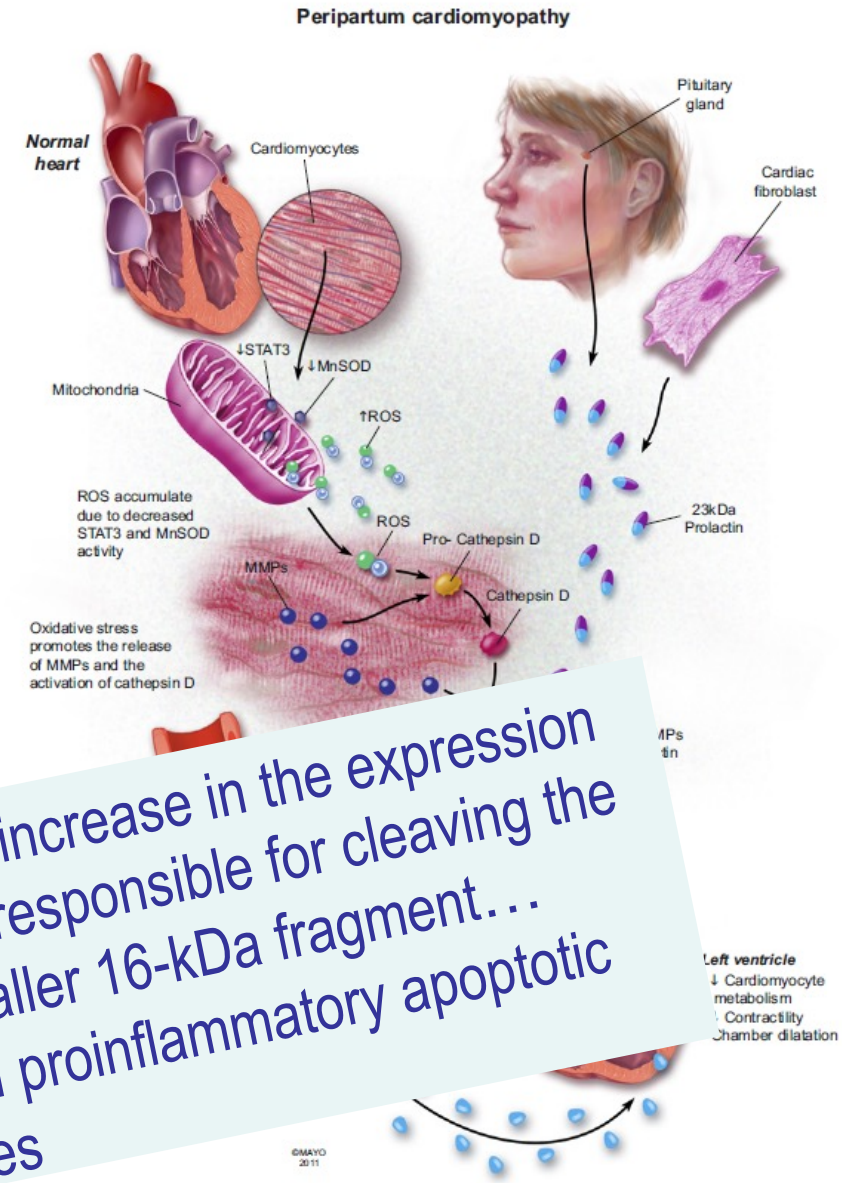
…o la gravidanza rende simili differenti tipi di cardiomiopatie

Peripartum Cardiomyopathy: Recent Insights in its Pathophysiology

Denise Hilfiker-Kleiner*, Karen Sliwa, and Helmut Drexler

Peripartum/Postpartum cardiomyopathy (PPCM) is a serious, potentially life-threatening heart disease of uncertain etiology in previously healthy women. Previous clinical and experimental data have identified inflammation, autoimmune processes, apoptosis, and impaired cardiac (systemic) microvasculature as typical features in the pathophysiology of PPCM. However, recent data have shown that unbalanced peri/postpartum oxidative stress is linked to proteolytic cleavage of the nursing hormone prolactin into a potent antiangiogenic, proapoptotic, and pro-inflammatory factor. These observations strongly suggest that prolactin cleavage can operate as a specific pathomechanism for the development of PPCM. Consistent with these findings, inhibition of prolactin secretion by bromocriptine, a dopamine D2 receptor agonist, prevented the development of PPCM in an animal model of PPCM, and first clinical experience are promising in this respect. Thus, inhibition of prolactin release may represent a novel specific therapeutic approach to either prevent or treat patients with acute PPCM. In this review, we [illegible] highlighting the current knowledge on risk factors, [illegible] chanisms, and treatment options for PPC[illegible]

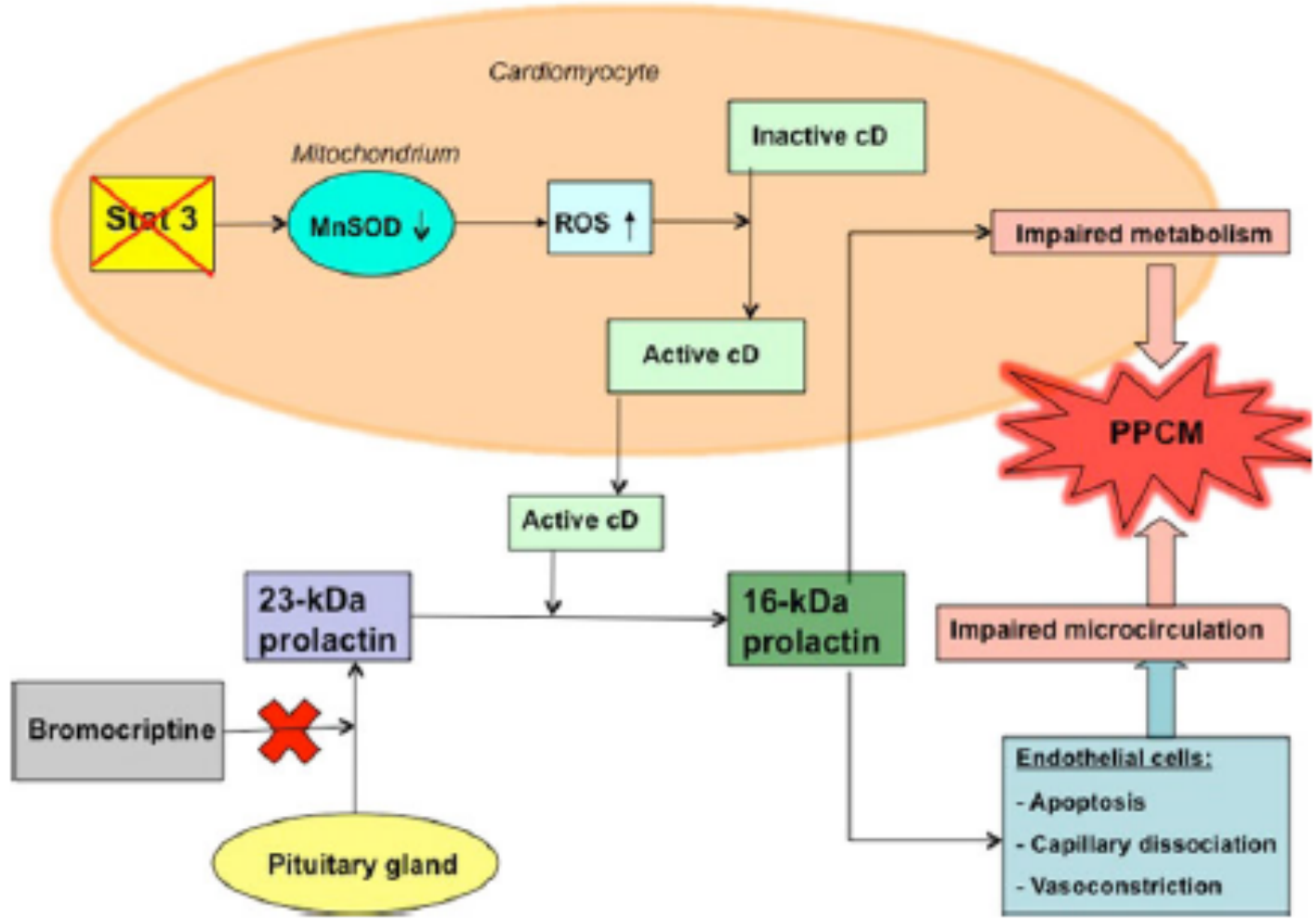
2008;18:173–179) © 2008 [illegible]



…detrimental effect of oxidative stress…increase in the expression and activity of cathepsine-D, which is responsible for cleaving the 32-kDa form of prolactin to a smaller 16-kDa fragment… vasoconstrictor, antiangiogenic and proinflammatory apoptotic properties

Figure 3 Reduced concentrations of STAT-3 in the cardiomyocyte leads to attenuated expression of the oxygen radical scavenger MnSOD. This leads to accumulation of ROS which promote the release of MMPs and activation of cathepsin D, and prolactin (23 kDa) is produced by the pituitary gland and cardiac fibroblasts. Cathepsin D and MMPs cleave 23 kDa prolactin into its 16 kDa form. Expression of 16 kDa prolactin decreases cardiomyocyte metabolism and destroys endothelial cells, resulting in vasoconstriction, apoptosis, inflammation, and dissociation of capillary structures. MMPs, matrix metalloproteinases; MnSOD, manganese sodium dismutase; ROS, reactive oxygen species; STAT-3, signal transducer and activator of transcription 3. Adapted from Hilfiker-Kleiner *et al*,[11] with permission.

Fig. 1 Development of PPCM. In the absence of cardiomyocyte STAT3 activity, the amount of MnSOD will decrease. This leads to an increase of oxidative stress and the release of cathepsin D, which processes 23-kDa prolactin into the 16-kDa form. The 16-kDa prolactin induces endothelial cell apoptosis, capillary dissociation, vasoconstriction and impairs cardiomyocyte metabolism, thereby promoting PPCM. Accordingly, bromocriptine, a pharmacological inhibitor of prolactin release, prevents PPCM by inhibiting 23-kDa prolactin. *cD* cathepsin D, *ROS* reactive oxygen species, *MnSOD* manganese superoxide dismutase



Neth Heart J (2011) 19:126–133
DOI 10.1007/s12471-011-0083-7

REVIEW ARTICLE

Peripartum cardiomyopathy: the need for a national database

S. I. Lok · J. H. Kirkels · C. Klöpping · P. A. F. Doevendans · N. de Jonge

Basic Res Cardiol (2013) 108:366
DOI 10.1007/s00395-013-0366-9

ORIGINAL CONTRIBUTION

Phenotyping and outcome on contemporary management in a German cohort of patients with peripartum cardiomyopathy

A. Haghikia · E. Podewski · E. Libhaber · S. Labidi · D. Fischer · P. Roentgen · D. Tsikas · J. Jordan · R. Lichtinghagen · C. S. von Kaisenberg · I. Struman · N. Bovy · K. Sliwa · J. Bauersachs · Denise Hilfiker-Kleiner

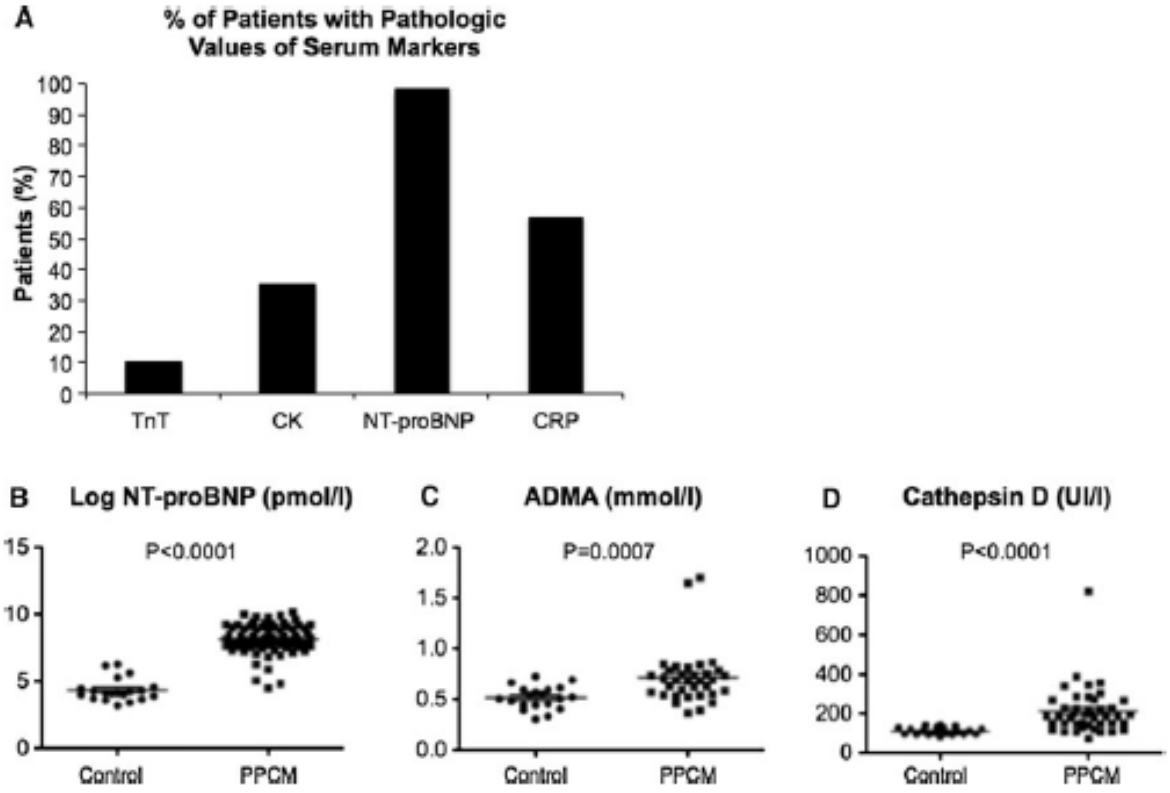


Fig. 2 **a** Percentage of PPCM patients with normal (TnT normal <0.01 µg/l, NT-proBNP normal in women <146 µg/l, CK normal in women <145 U/l, CRP normal <8 mg/l) and with pathophysiologic relevant serum levels of TnT ($n = 49$), CK ($n = 63$), NT-proBNP ($n = 69$) and CRP ($n = 72$) at the time of diagnosis. Baseline serum levels of **b** NT-proBNP (PPCM, $n = 69$; control, $n = 19$), **c** ADMA (PPCM, $n = 34$; control, $n = 19$) and **d** Cathepsin D (PPCM, $n = 43$; Control, $n = 19$). p value compares PPCM vs. healthy postpartum controls

PERIPARTUM CARDIOMIOPATHY: TREATMENT

– ADDITIONAL TREATMENTS

Experimenta therapy:

- Immunosuppressive therapy
  - Limited to myocarditis (biopsy) and not improved after 2 weeks of treatment
- Intravenous immunoglobilin
- Pentoxifylline
- **Bromocriptine**

Implantable cardioverter-defibrillator

Cardiac assist devices

Cardiac transplantation

- Survival (?)
  - » = Other CMP (Keogh, 1994)
  - » Reduced survival
- Early rejection

Evaluation of Bromocriptine in the Treatment of Acute Severe Peripartum Cardiomyopathy

A Proof-of-Concept Pilot Study

Karen Sliwa, MD, PhD; Lori Blauwet, MD; Kemi Tibazarwa, MD; Elena Libhaber, PhD; Jan-Peter Smedema, MD, MMed(Int); Anthony Becker, MD; John McMurray, MD, FESC; Hatice Yamac, MD; Saida Labidi, MSc; Ingrid Struman, PhD; Denise Hilfiker-Kleiner, Pl

Background—Peripartum cardiomyopathy (PPCM) is a potentially life-threatening heart disease that occurs in p healthy women. We identified prolactin, mainly its 16-kDa angiostatic and proapoptotic form, as a key factor pathophysiology. Previous reports suggest that bromocriptine may have beneficial effects in women with acut PPCM.

Methods and Results—A prospective, single-center, randomized, open-label, proof-of-concept pilot study of wo newly diagnosed PPCM receiving standard care (PPCM-Std; n=10) versus standard care plus bromocriptine fo (PPCM-Br, n=10) was conducted. Because mothers receiving bromocriptine could not breast-feed, the outcome of their children (n=21) was studied as a secondary end point. Blinded clinical, hemodyna echocardiographic assessments were performed at baseline and 6 months after diagnosis. Cardiac magnetic imaging was performed 4 to 6 weeks after diagnosis in PPCM-Br patients. There were no significant diffe baseline characteristics, including serum 16-kDa prolactin levels and cathepsin D activity, between the 2 stud PPCM-Br patients displayed greater recovery of left ventricular ejection fraction (27% to 58%; $P=0.012$) with PPCM-Std patients (27% to 36%) at 6 months. One patient in the PPCM-Br group died compared with in the PPCM-Std group. Significantly fewer PPCM-Br patients (n=1, 10%) experienced the composite end poi outcome defined as death, New York Heart Association functional class III/IV, or left ventricular ejectio <35% at 6 months compared with the PPCM-Std patients (n=8, 80%; $P=0.006$). Cardiac magnetic resonanc revealed no intracavitary thrombi. Infants of mothers in both groups showed normal growth and survival.

Conclusions—In this trial, the addition of bromocriptine to standard heart failure ventricular ejection fraction and a composite clinical outcome in women with acute of patients studied was small and the results cannot be considered definitive. L studies are in progress to test this strategy more robustly. (***Circulation***. **2010;12**

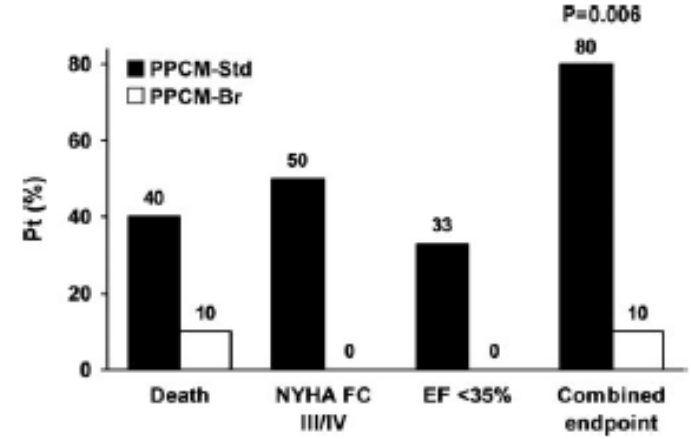


Figure 3. Comparison of 6-month prespecified poor outcome, including death, NYHA functional class (FC) III/IV, and LVEF <35% among survivors, and the combined end point including all 3 of these end points for PPCM-Br vs PPCM-Std patients (Pt).

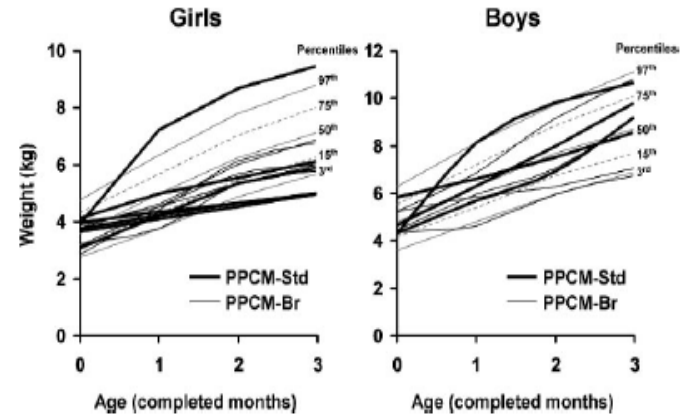
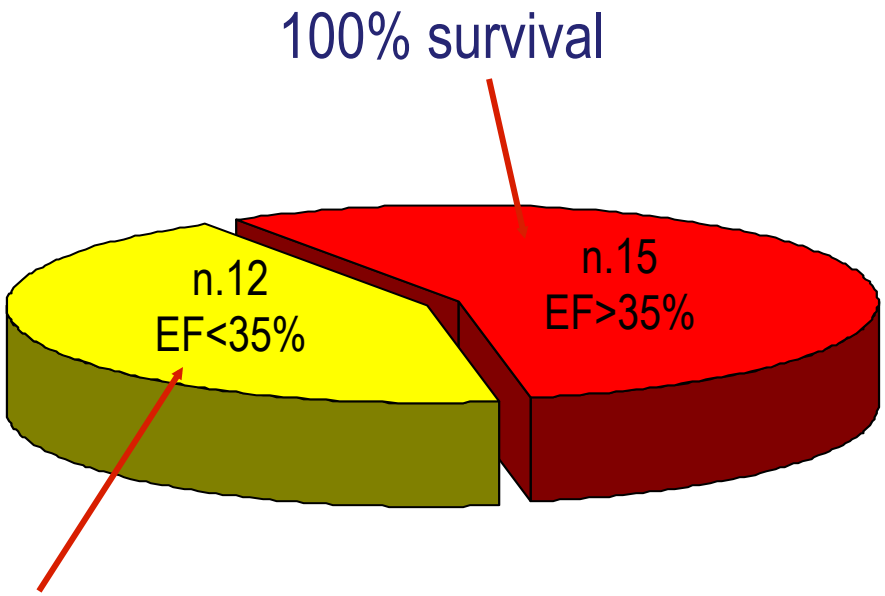


Figure 5. Growth and survival of children of PPCM study mothers from birth to 3 months plotted on World Health Organization growth charts.

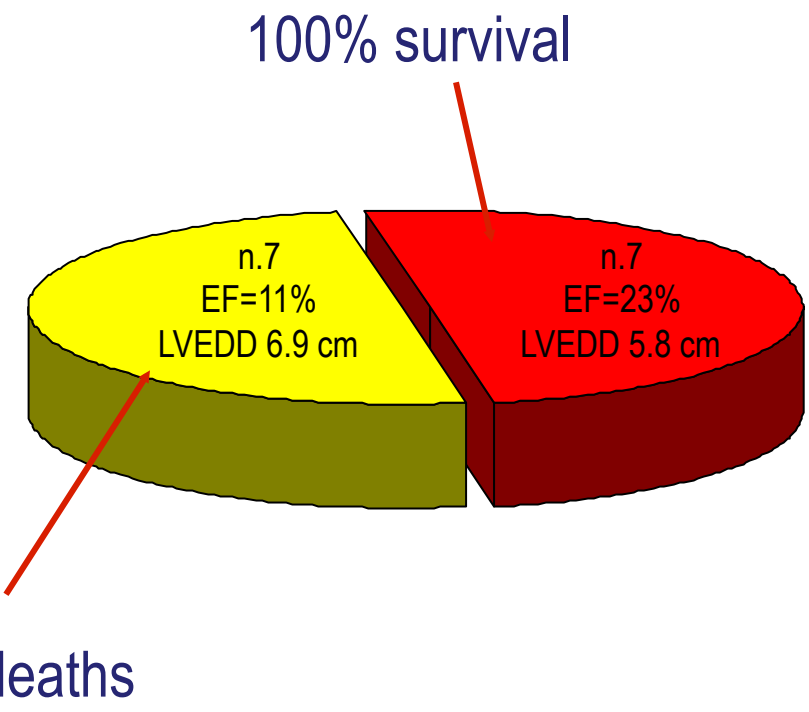
PERIPARTUM CARDIOMIOPATHY: PROGNOSIS

- The prognosis of PPCM depends on the normalization of LV function < 6 mo. after delivery.
- If EF% is < 35% the 10-year actuarial survival rate has been estimated to be 42% (Davis MD, 1992)
- The mortality rate of PPCM has been reported to be 25-50% and most deaths < 3 mo. after diagnosis for progressive CHF, arrhythmias and thromboembolism.
- Patients with PPCM whose LV function recovers have a significanly improved survival.

LONG-TERM PROGNOSIS OF PPCM AND LV FUNCTION



Demakis et al, 1971



St John-Suttom MS, 1991

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Recovery from severe heart failure following peripartum cardiomyopathy ☆

James D. Fett *, Herriot Sannon, Emmeline Thélisma, Therese Sprunger, Venkita Suresh

Department of Adult Medicine, Hôpital Albert Schweitzer, Deschapelles, Haiti

Characteristics of recovered and nonrecovered Haitian peripartum cardiomyopathy patients

Characteristics	Recovered (n = 32)	Nonrecovered (n = 84)	*P* value
Mean age at diagnosis, y (range)	33.8 (17–47)	31.6 (16–50)	NS
Mean parity at diagnosis (range)	4.7 (1–9)	4.3 (1–11)	NS
Mean LVEF at diagnosis (range)	0.28 (0.15–0.40)	0.23 (0.15–0.35)	0.002
NYHA Functional Class III/IV at diagnosis	94% 30/32	92% 77/84	NS

Abbreviations: NYHA, New York Heart Association; LVEF left ventricular ejection fraction.

Length of time required for recovery of left ventricular function in 32 Haitian peripartum cardiomyopathy patients

Months post diagnosis	6	12	18	24	30	36	48
Patients (no.)	2	6	7	8	5	2	2
Cumulative	2	8	15	23	28	30	32
Total (%)	6.3	25	46.9	71.9	87.5	93.8	100

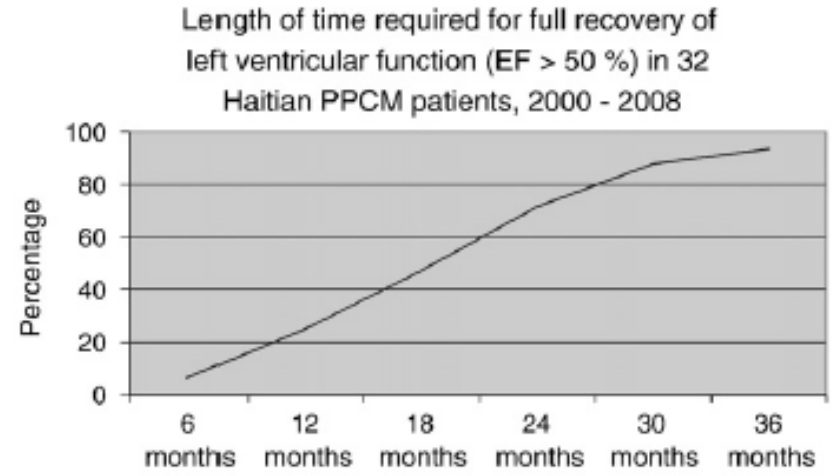


Fig. 1. Progression from shortest to longest time required for left ventricular systolic function recovery in peripartum cardiomyopathy.

Favourable outcome after peripartum cardiomyopathy: a ten-year study on peripartum cardiomyopathy in a university hospital

Kok-Han Chee, MBBS, FESC

INTRODUCTION Peripartum cardiomyopathy (PPCM) is an uncommon form of congestive heart failure, affecting obstetric patients around the time of delivery. The epidemiology of PPCM is infrequently reported. This study was undertaken to define the prevalence, presentation and outcome of PPCM among women giving birth in a teaching hospital in Malaysia.

METHODS A retrospective case record analysis was conducted on all patients admitted and diagnosed with PPCM at the University Malaya Medical Centre, Kuala Lumpur, Malaysia, from 1 January 2000 to 31 December 2009. All deliveries were undertaken in the same hospital.

RESULTS A total of 12 patients were diagnosed with PPCM during the ten-year study period. The prevalence of PPCM was 2.48 in 100,000 (1 in 40,322) live births. Nine women were diagnosed with PPCM within five months of delivery. Three women had twin pregnancies. There was one death in the group (mortality rate 8.3%). The mean left ventricular ejection fraction at the time of diagnosis was 28.9% ± 8.5% (range 15%–40%). Following the index event, left ventricular function normalised in six of the nine patients (66.7%) who underwent subsequent echocardiography one year later. All patients were treated with standard heart failure therapy. Two patients with normalised left ventricular function had subsequent pregnancies – one pregnancy was terminated at seven weeks and the other patient delivered uneventfully at full term.

CONCLUSION PPCM is uncommon. The outcome in our series was favourable, with 66.7% of patients with PPCM recovering their left ventricular function. The mortality rate was 8.3%.

Keywords: epidemiology, heart failure, peripartum cardiomyopathy, pregnancy
Singapore Med J 2013; 54(1): 28–31

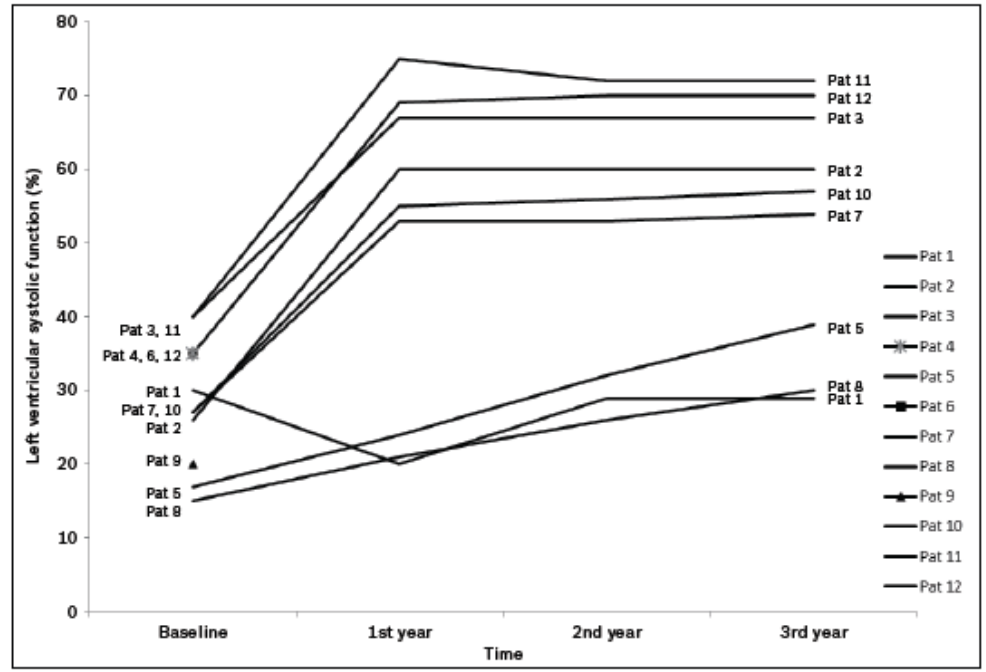
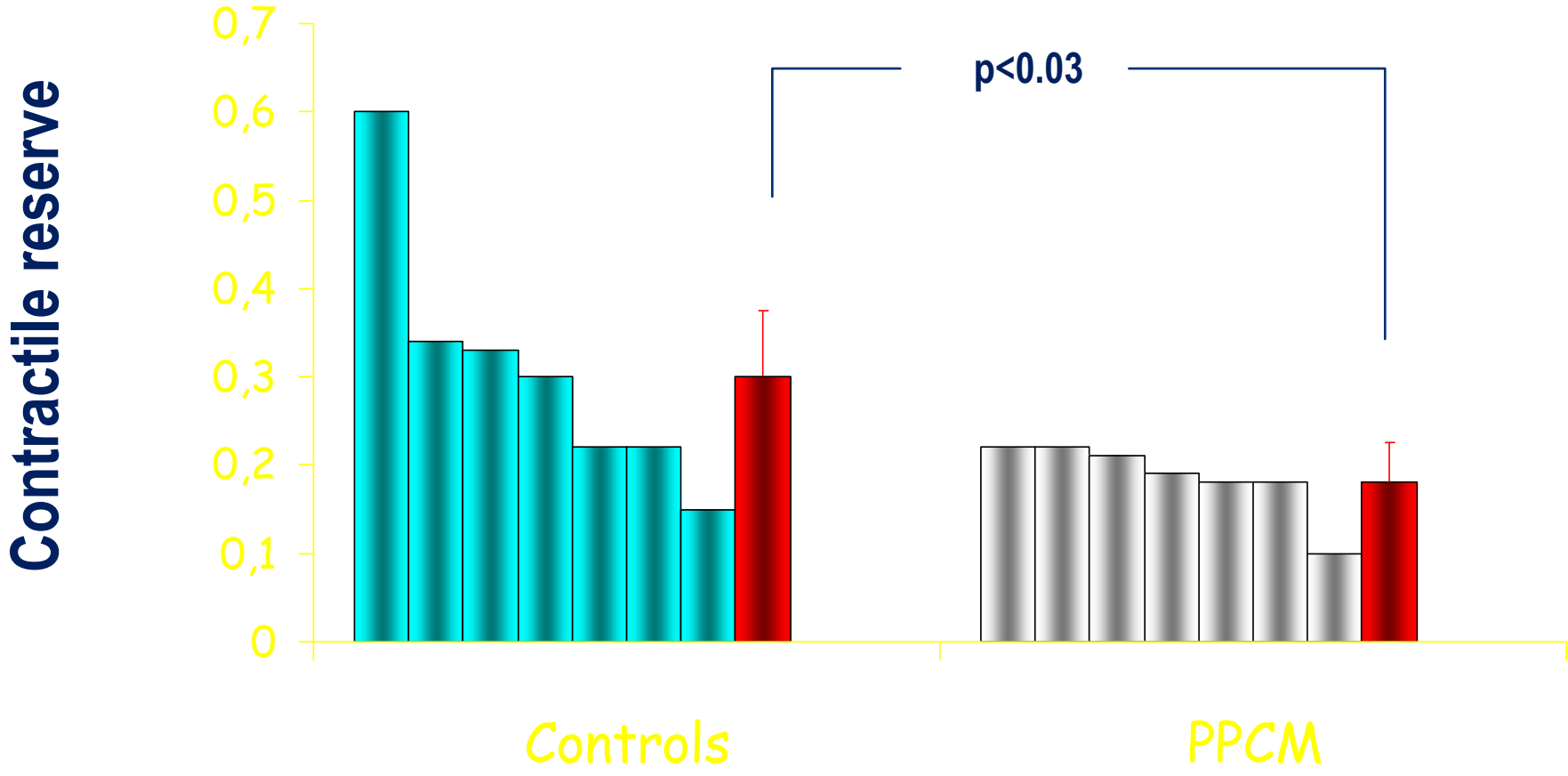


Fig. 1 Graph shows the left ventricular ejection fraction of patients at baseline and during follow-up. Patients 4, 6 and 9 did not undergo subsequent echocardiography.

Contractile reserve of the LV among patients recovered from PPCM and matched controls



Lampert MB et al, Am J Obstet Gynecol,1997

CARDIOMIOPATIA PERIPARTUM : caso clinico

- *33 anni, 2 anni fa gravidanza con 2 episodi di gastroenterite e dispnea con ortopnea nell'ultimo mese*
- *Travaglio piuttosto lungo, con necessità di ossitocina*
- *Tentativo di parto vaginale con anestesia spinale (fentanil)…*
- *Cesareo con epidurale complicato da dispnea acuta e parestesie diffuse (anche arti superiori)… terapia non meglio precisata, prurito al volto…dispnea, shock, perdita di coscienza*
- *Bambina 3340 g, Apgar 1 min 9, Apgar 5 min 9*
- *Ecocardiogramma il giorno dopo il parto: DTDVsn 56 mm, DTSVsn 48 mm, AF 14%, FE 27%, IM lieve, IT lieve, versamento pericardico lieve*
- *Ecocardiogramma 5 giorni dopo il parto: DTDVsn 65 mm, DTSVsn 46 mm, AF 29%, FE 34%, IM minima, IT lieve, pattern restrittivo, versamento pericardico lieve*
- *Rapido miglioramento clinico e strumentale (terapia con ACE-I, beta-bloccante gradualmente "autoridotta")*

Diagnosi di PPCMP, successivamente messa in dubbio in altra sede x la rapidità di comparsa e risoluzione (shock da fentanil?)

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Diagnosi di PPCMP, successivamente messa in dubbio in altra sede x la rapidità di comparsa e risoluzione (shock da fentanil)

- *Al momento della visita: asintomatica, ecocardiogramma normale, ancora in tp con ACE-I e betabloccante*

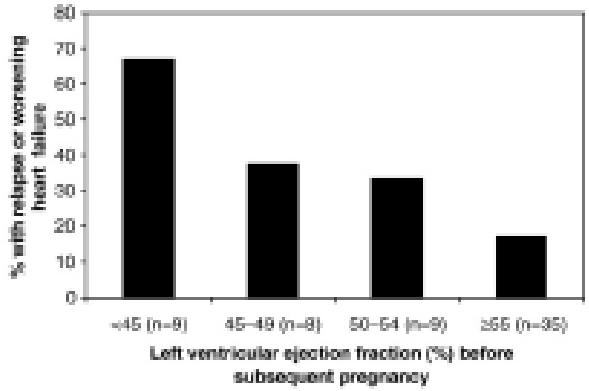
desidera un'altra gravidanza

(tassativamente sconsigliata in altre autorevoli sedi)

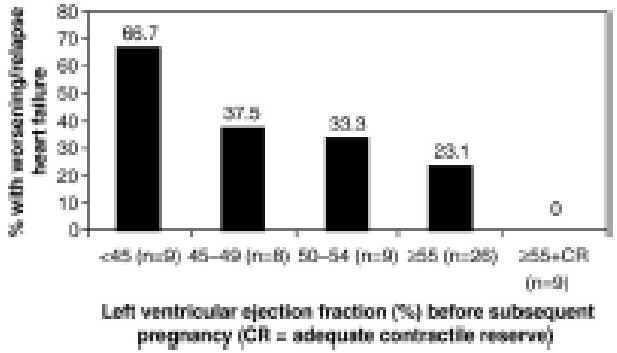
Risk of heart failure relapse in subsequent pregnancy among peripartum cardiomyopathy mothers

James D. Fett [a,b,*], Karie L. Fristoe [b], Serena N. Welsh [b]

[a] Peripartum Cardiomyopathy Research Project, Department of Adult Medicine, Hôpital Albert Schweitzer, Deschapelles, Haiti
[b] A Mother's Heart, Peripartum Cardiomyopathy Support Network



3 criteria were identified to be associated with a lower risk of heart failure relapse in a subsequent pregnancy: (1) regain an LVEF of 0.55 or greater after the index PPCM pregnancy; (2) retain an LVEF of 0.55 or greater after cardiologist-supervised discontinuation of heart failure medications; and (3) demonstrate adequate contractile reserve by exercise stress echocardiography. No relapses were observed when all 3 criteria were met (Table 1 and Fig. 2).



CARDIOMIOPATIA PERIPARTUM : caso clinico

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- *Sospende terapia*
- *Rivalutazione clinica e strumentale dopo 6 mesi*
- *Ecocardiogramma: DTDVsn 46 mm, DTSVsn 31 mm, VTDVsn 97 ml, VTSVsn 37 ml, FE 60%*
- *Ecostress con dobutamina (fino a 20 gamma/Kg/min): ottima risposta inotropa con incremento di FE fino a 75% e lieve riduzione dei volumi*

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PERIPARTUM CARDIOMIOPATHY: OPEN PROBLEMS

- Real prevalence and incidence
- Definition of risk factors and prognosis (subsequent pregnancies)
- The role of hypertension/preeclampsia (prolactin)
- The role of genes
- Central serum and tissue bank
- Evaluation of the effects of treatment

International Registry

National Heart, Lung, Blood Institute and Office of Rare Diseases Workshop on PPCMP, JAMA 2000

EUROPEAN SOCIETY OF CARDIOLOGY®

EURObservational Research Programme

Long-Term Registry on Patients with Peripartum Cardiomyopathy (PPCM)

Protocol

June 1st, 2012

Registry promoted by the European Society of Cardiology

EUROPEAN SOCIETY OF CARDIOLOGY®

EUROBservational Research Programme

Long-Term registry on Patients with Peripartum Cardiomyopathy (PPCM)

Protocol

18 February 2015

Version 2.0

EURObservational Research Programme Peripartum Cardiomyopathy (PPCM) Registry

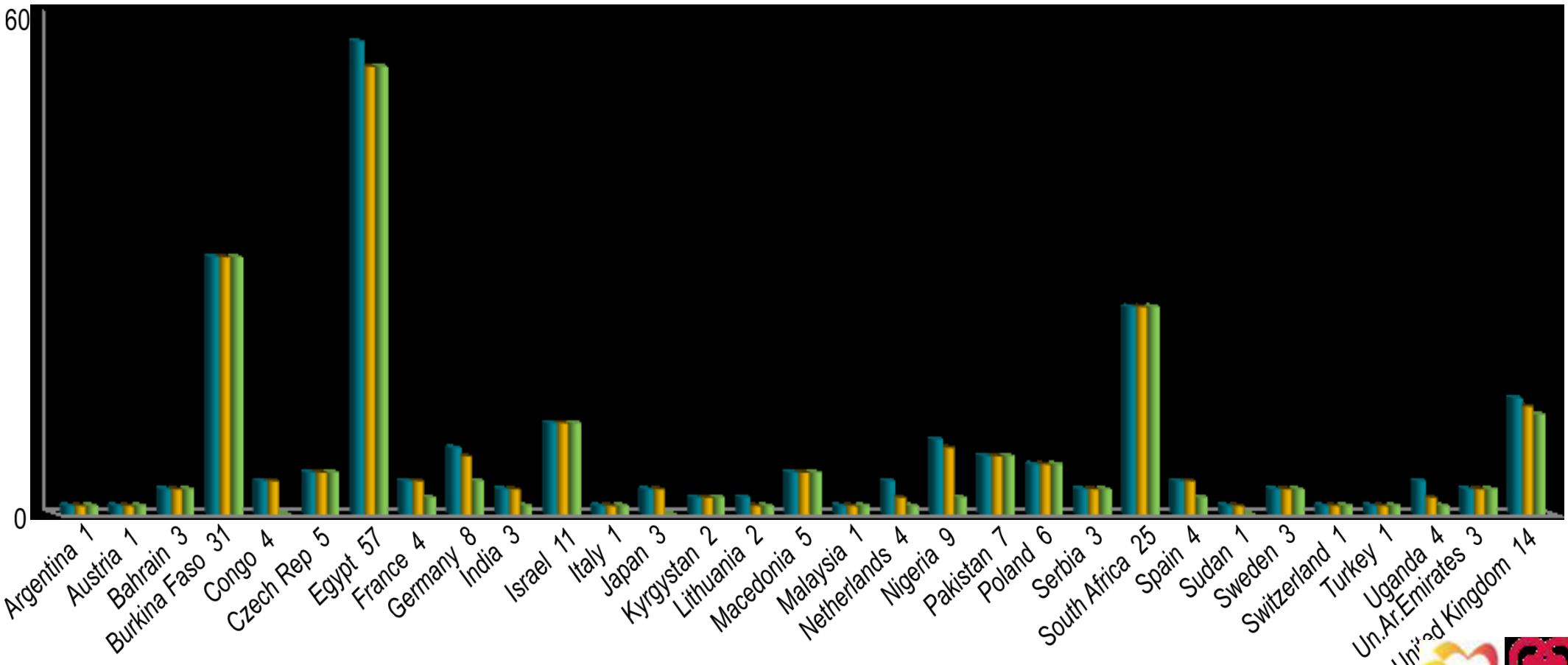
Newsletter N° 10 – March 2015

Dear Colleagues, dear Friends,
I would like to welcome Prof. Johann Bauersachs as co-chair of this programme. I would like to take this opportunity to thank Prof. Burkert Pieske for all his efforts over the past years.
We are excited to let you know that we have now more than 300 patients included, a number from new countries as Canada, Iraq, Honduras.
Other countries (Australia, Azerbaijan, Bangladesh, Belgium, China, Ethiopia, Georgia, Greece, Korea, Mozambique, Romania, Russia, Saudi Arabia, Singapore, Ukraine, United States) have registered and we are looking forward to their contributions.
We are now a truly international registry!
Please see protocol amendments and information related to the biomarker-sub-study below.
We are looking forward to see hopefully many of you in Seville or London.
With best wishes
Karen Sliwa

Peripartum Cardiomyopathy Registry

Recruitment status as of August 21st, 2014

227 Patients enrolled
By 52 centres in 31 Countries



EORP - Peripartum Cardiomyopathy Registry

Baseline Characteristics (5/5) August 2014

item	number	
age	216	30-0±0.4 yrs
parity	130	3.3±0.2
HR	210	104.2±1.5 b/min
BP	194	117.3/75.6±1.6/1.0 mmHg
LVESD	184	50.5±0.6 mm
LVEDD	201	61.1±0.5 mm
EF (Teichholz)	179	32.4±0.7 %
HBP during pregnancy	216	18.5 %
PE	216	14.4 %
diabetes	216	4.2 %
betablockers	208	12.0 %
bromocriptine	207	3.9 %
diuretics	207	11.6%
ACE-I	207	8.2 %

EORP - Peripartum Cardiomyopathy Registry

6 month follow-up August 2014

item	number	
mortality	108	4.6 %
HR	97	78.9±1.4 b/min
BP	96	113.7/73.1±1.3/1.0 mmHg
EF	95	44.2±1.4 %
betablockers	107	78.5 %
bromocriptine	108	26.9 %
diuretics	108	77.8 %
ACE-I	108	76.9 %

Registry on Peripartum Cardiomyopathy

- To raise awareness of this uncommon but devastating problem
- To better understand the condition
- To improve management strategies
- A joint activity of ESC and ESC affiliated countries