CARDIOLOGY 2024 Case Presentations:

Nomenclature can help define therapies in HF

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OBJECTIVES

- 1. Describe 2 cases with ADHF
- 2. Discuss the hemodynamic profiles and their significance
- 3. Apply SCAI Cardiogenic shock definition
- 4. Discuss new evidence on CS in children



CASE RK

- 8 day old male with respiratory distress
- Mother presented 3 d prior delivery with fever, nausea and vomiting.
 Labor induced due to fetal tachycardia. Mother was febrile 100.4°F
- There was neonatal fever 100.4°F
- Cold feet and lukewarm. Grade 2/6 high frequency HSM; Gallop+;Tachypnea with mild intermittent retractions; liver 3 cms BRCM
- Cr-0.4 ; AST- 70 PT-15; Full septic workup
- Started on Antibiotics

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WHAT HEMODYNAMIC PROFILE IS HE ON?

- a. Cold and wet
- b. Warm and wet
- c. Cold and Dry
- d. Warm and Dry

Cold feet and lukewarm



WHAT HEMODYNAMIC PROFILE IS HE ON

- a. Cold and wet
- b. Warm and wet
- c. Cold and Dry
- d. Warm and Dry

Cold feet and lukewarm



EKG







WHAT INTERMACS STAGE IS HE ON?

- a. Critical cardiogenic shock (IM-1)
- b. Progressive decline (IM-2)
- c. Stable but inotrope dependent (IM-3)
- d. Recurrent advanced HF (IM-4)



WHAT INTERMACS STAGE IS HE ON?

- a. Critical cardiogenic shock (IM-1)
- b. Progressive decline (IM-2)
- c. Stable but inotrope dependent (IM-3)
- d. Recurrent advanced HF (IM-4)

COURSE

- Developed atrial flutter which was cardioverted
- Initial Troponin I was 37 mg/dL
- CSF positive for Enterovirus
- Patient developed significant mitral regurgitation and CHF
- Was intubated for 2 ½ weeks and kept on milrinone continuous infusion for 3 weeks- Thought of VAD x2
- Was discharged home after 4 weeks on: Captopril, sildenafil, lasix and amiodarone
- 5 months later=normal function

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HEMODYNAMIC PROFILE IN HF

Warm & Dry Represents asymptomatic ventricular dysfunction (normal filling pressures and adequate perfusion). The primary focus is on the prevention of disease progression and decompensation.	Warm & Wet The most common presentation and can be characterized by elevated filling pressures and pulmonary edema with adequate perfusion.
Cold & Wet Characterized by elevated filling pressures and poor perfusion. These patients often require intensive care management.	Cold & Dry A dire condition best described as the presence of normal filling pressures with poor perfusion. These patients require aggressive treatment to minimize the workload of the myocardium.

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HEMODYNAMIC PROFILES DATA

trained of the Assessing Cathon of Cashining Vol. 8, No. 11, 200 8.307 to the Internal Dillage of Earlining Providence 201 (21) (0101000) faitability (perior to: IN IS NAMED INFORMATION **Heart Failure** Clinical Assessment Identifies Hemodynamic Profiles That Predict Outcomes in Patients Admitted With Heart Failure Anja Nolnia, MD, Sui W, Trang, JS, James C, Fang, MD, Eldrin F, Lovin, MD, John A, Jachn, MD, Gilbert H. Mulge, MD, Lynne W. Stevensor, MD Borne, Manashantei ORDETING The cub was designed to descentes the voluments of a pressed standington for advanced least fallary (HF). Profile hand on dettad assessment of songestion and performe at the its of hopidistics was crepted with advected astorney. EXCREMENT Optimal langes of theseay and reads for advanced TVP meansr latticed by the lack of simplelines rolly to character pattern. WITHOUT Properties unless was performed for 412 patients admitted to the antiderrorpathy service at the Brigham and Woman's Hospital with a diagrams of HF. Pattern were classified by distail assessed into four perflex perfle A, parama with so midmar of orogenitos in hyperbaint tity-ways, v = 1200 profile & competito with adepute patience (wetwere, a = 222s profile C, emposite and hyperbalan (wer call, a = 142 and profile I). hyperbates without congenizes (day cold, u = 36). Other standard publices of materials way turbular and parameters ways followed for the and potent of death (s = 117) and death or argent transplantation in ~ 1577 at one year STREETS . Soviet stubia showed that classic profile prelist sectores in HF. Pollin II and C. itemase the risk of doubt plus argent manufacturism by antennas (Japani rate 318) 1.63, p = 0.02 and multivatur majour Fill 1-40, v = 0.0031. Meratur, clause probles add preposite information point when listened to partners with New York Heart Association NEHV: dae IBW gentron (pedicit Hill 22), y + tribs; pedic C 101 27, y = CONCLUSION Striple thread assessment as he and to define prefiles to paraste admitted with HF. These profile predict successes and may be used to gade therapy and identify psychology for factor anneignine. () Am Cell Cardier 2010 at 1797-804 () 2011 by the American College of Cardinary Francation to not transmit for heart false (FIP) energy, then is an indication such as the New York High Association sugent used to identify the appropriate patient for each - (NYHC) symptom dassification are adjustive and difficult through The sectors of patent logituling with al- to apaser from consumption dense condition. Manvisual to verse HF present particular challenges. In . Identities when such as summinimumal markers and result divisil this, first prints must been those for where ... indice, although sathlin lays considering, do not rewrite

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Association of Hemodynamic Profiles With Wait-List Mortality in Children Listed for Heart Transplantation With Idiopathic Dilated Cardiomyopathy

Tajinder P. Singh, MD, MSc2-1-9, Elizabeth D. Blume, MD5-7, Peta M. Alexander, MBBS7, and Kimberiee Gauvreau, ScD*

The prognostic significance of intracardiar hemodynamics in children with advanced hears failury is unknown. The purpose of this study was to describe hemodynamic profiles in children with idiopathic dilated carifornyopathy (IDC) listed for heart transplant (HT) and to assess their association with wait-list mortality. We identified all US children s18 years with IDC listed for HT during 2000 to 2010 with available pulmonary capillary wedge pressure (PCWP) and cardiac index (CIs) data. We excluded children on ventilator or mechanical support at failing. CIx >2.2 L/min/m2 (warm) and PCWP >18 mm Hg (wet) were used to define 4 hemodynamic profiles warm dry, warm wet, cold-dry, and cold-wet, The primary end point was death on the walf-list or becoming too sick to transplant. Of 476 children analyzed, 248 (825) children had PCWP >18 mm Hg and 300 (67%) had Cla \$2.2 L/min/m⁶. Overall, 36% children were warm-dry, 27% were warm-wet, 12% were cold-dry, and 25% were cold-wet, 32 (6.7%) children reached the primary end point. In authusted analysis, cold-dry (hazard ratio [HR] 3.3, 95% coellidence interval [C1] 1.1, 11.5) and cold wet (HR 3.2, 95% CI 1.2, 9.6) children were at higher risk of wait-list death versus warm-dry children, whereas warm-wet children were not (HR 2.3, 95% CI 0.8, 6.6). All groups were equally likely to receive HT and had similar 1-year post-transplant survival. In conclusion, in children with IDC listed for HT, those with low cardiac output at evaluation are at higher risk of wait-list mortality. Defining hemodynamic profiles may improve risk stratification of children with IDC listed for HT. @ 2015 Elsevier Inc. All rights reserved. (Am J Cardiol 2015)(15:243-248)

Left-sided congestion or volume overload is the primary hernalynamic abnormality in the yast matority of adults with heart failure and has been associated with increased risk of adverse outcomes such as death or representalization.118 In contrast, cardiac utdex (Cla) has not shown a similar areaciation with outcomen in these patients. How hest to evaluate and that volume overlead has been a major area of investi-gation in adults with heart failure 2012 No shuly has systematically assessed intracardiar inmodynamics in children with systemic ventricular dysfunction and heart failure. The purpose of this study was to use right sided cantiac cathoterization data to define 4 hemodynamic profiles (warm-dry, warm-wat, cold-dry, and cold-wet) in altilideen with idiopublic difated cardiomycpathy (IDC) listed for heari transplant (HT) and to assess the association of these profiles. with walt-list mortally. Our hypothesis was that wurm-wet, cold-dry, and odd-wat chaldren will be at higher tick of wait-list montality compared with warm-dry children.

"Department of Cardiology, Boston Children's Hospital, Boston, Mararchitectus, "Department of Pediatrice, Darrand Medical Schemit, Bosseni, Moove-Insuits, and "Department of Bendaratics, Harvard School of Paritie Haakh Bonton, Managharatis, Managanga monosal Impenning 10, 2018. tormal immunish sectored and accepted theories 14, 2014. See page 347 Sty disclosure information

Conceptioning authors Tal. (617) 255-2558. Full-SELTY 734-98181 W-mail address 'TP. Nugitif's point relations on (T.P. Singh).

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Using the Organ Procurement and Transplant Network (OPTN) database, we identified all children < 18 years listed for HT in the United States during 2000 to 2010 with a diagoosis of IDC who had pulmonary capillary wedge pressure (PCWP) and CIA data reported at listing. We excluded children with (1) a diagnosis of myocarditis, (2) listing for permisplantation or multiceguit transplantation, and (3) ventilator or mechanical support at listing. The OPTN database includes clinical information in all children listed for HT in the United States submitted by manuplant centers. The Health Resources and Services Administration. US Department of Health and Human Services, provides oversight to the activities of the OPTN contractor, United Network of Organ Sharing (UNOS).

We used CTs and PCWP dots (CIs >2.2 L/min/w? defined as warm, < 2.2 defined as suid: PCWP >18 mm Hg defined as wet, and <28 defined as dry210 reported at HT listing to divide study children into 4 hemodynamic groups: warmi-dry, warm-wet, cold-dry, and cold-wet. The groups were composed for basebre characteristics and extremes. The primery end point was a composite of death on the waitlist or becoming too sick to transplant (defisting because of deteriorution) and was assessed using time-to-event andysis up to 1 year after listing. Children who received HT or were removed from the list because of recovery or other reasons ware issueded. A secondary and point was post-maroplani graft loss (death or retranglamation) is children in the 4

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CLINICAL RESEARCH Heart Johns'conterryspetty

Haemodynamic profiles of children with end-stage heart failure

Sharon Chen⁴⁺⁷, John C. Dykes³⁷, Doff B. McElhinney¹, Robert J. Gajarski², Andrew Y. Shin¹, Seth A. Hollander¹, Melanie E. Everitt², Jack F. Price⁴, Ravi R. Thiagarajan', Steven J. Kindel', Joseph W. Rossano', Beth D. Kaufman', Lindsay J. May*, Elizabeth Pruitt, MSPH*, David N. Rosenthal*, and Christopher S. Almond¹

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Introduction

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LESSONS FOR THE CLINICIAN

- Myocarditis is a serious but reversible cause of ventricular dysfunction
- EKG still might be helpful diagnosing some conditions
- Management of the hemodynamic profile + changes and not the echocardiogram are helpful to select appropriate therapies
- Patient was hypertensive; cool feet and congested-IM-3
- With milrinone: hemodynamics improved. Although ischemic cause and atrial flutter-; Course satisfactory on milrinone

CASE: 17 YEARS OLD

- 85kg patient with a hx of OHT for cardiomyopathy in 05/2021
- Presented with Vomiting and SOB x 3 days
- She presented with large pericardial effusion and severe LV dysfunction to OOSH
- Now s/p pericardial window, then persistently increasing lactic acid (>14) on increasing pressor support and wide complex tachycardia s/p 1x DCCV (and 1x Amiodarone bolus),
- Transport call for urgent transfer on Epi=0.2 mcg/kg/min. Lactate=6
- Cr 0.9 (baseline 0.7), transaminitis (~500)
- Transport team recommended VA ECMO in OOSH and then transfer

CASE: 17 YEARS OLD

- Per OOSH team, was interactive and neuro appropriate until sedation for DCCV.
- ECMO: ~4.2L/min flows 60% Fio₂ sweep 2 with signs of adequate end organ perfusion with UOP and cleared acidosis
- Lactate initially cleared to <2. Currently without significant pulmonary edema or high respiratory settings. Positive for rhinovirus, RSV, enterovirus without prodromal symptoms
- Good UOP. Empiric cefepime with Bcx at OSH







QUESTION

- What would you estimate of PCWP be?
- A. Less than 15 mm Hg
- B. 15-20 mm Hg
- C. 20-25 mm Hg
- D. 25-30 mm Hg
- E. More than 30 mm Hg

QUESTION

- What would you estimate of PCWP be?
- A. Less than 15 mm Hg
- B. 15-20 mm Hg
- C. 20-25 mm Hg
- D. 25-30 mm Hg
- E. More than 30 mm Hg

10/25 Study





CXR APPEARANCE AND PCWP





SINGN CHARGE MID, DAVID WEISH, M.D., HEARDERTERBATTINGS, M.D., FOR LADO DE MANCHENE M.D., LAURE FUTTIONNEL (CH., HERMETH M. REPUBLIC, M.D., Resigner J. Mychaechel, m.D., Marris, Farndy

PURPORE Clinical and radiographic examinations are commonly used for estimating severity and thirsday therapy of chreate congastive heart failure. The purpose of this dudy was to establish the relationship herware findings on history, physical examination, chost recoverentgran, and pulmenary capillary wedge pressure (PCWIP).

PATTENTS AND NETWORK Fifty-two consecutive patients with chronic congostive heart failure. colorned for evaluation for heart manaplants. tion, were studied all patients underwarts history, physical examination, upright chost routgenogram, and cardiac cutheterization. The mean left ventriesdar spection fraction was 0.10 a 4.00. Patients were divided into three groups according to their FUWP: Group 1, normal PCWF dass than or equal to 11 mm Hg, w = 185 Group 2, mild to moderately simular PCWP (16 to 29 man Hg, a = 151; Group I, markedly elevated PCWP igneator than or optal to 30 min Hg. n redisgraphic signs of congestion. - 184

REFELTS Provinal and radiographic signs of congestion were more common in the groups with higher FCWP, but they rould not be cased to reliably separate patients with different filling pressures. Physical finitings torthopten, eduion, raise, third heart estant, elevated turnlar venone pressure) or radiographic signs trardimergely, vacular redistribution, and inteoretitial and alveolar edenas had pour produtive value for identifying patients with PCWP values greater than at equal to 30 new Hg. Three findings had poor negative predictive value to enclose significantly elevated PCWP (greater

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that 29 mm Hgt. Radiographic pulmonary congosting was absent in eight \$57%) patients in Group 2 and serves (20%) in Group 2. In patients is Group 2 and 3, these without realizers after comportion were in a better New York Hourt Associeties fanctional class 153 ± 0.5 review 2.6 ± 1.0, p <0.01). There was goal correlation hertreasu eight attial pressure and PCWP to = 0.04. p 10,0015. A personal right atrial pressure had no predictive value, but a pressure greater than 30 men Hg was seen in all but one patheat with a PCWP value greater than 29 mm Hg.

concussors Clinical, radiographic, and hemodynamic evaluations of shrink congestive heart failure visit onificting reads. Absence of radisgraphic or physical signs of congestion does not ensure normal PCWP values and may lead to intervarie disgonais and intervants therapy. It is not known whether thempy almost at normalking PCWP is superior to relieving clinical and

Heart failure is defined as a pathophysiologic tice is responsible for the follow of the heart to perce blood at a rate commonweaves with the regatremony of the metabolicing tissues [1]. The dinision often recignizes heart failure by the manifestations of congestion and not by the recognition of a low cardiac output [1]. There is a general misconreption first the eliminal features of sconnection supate with the severity of heart failure [5], and their absence indicates normal filling pressures. Although it is known that some patients with heart failure have no slinked or twillographic signs of conperting, douptie marketly elevated filling prosecres and cleartened cardine unique (3.4), this phonumeson has mosived very little streetles. The lask of and entereding of this planets man leads to an error nexus imprension of the patient's true services statos and incluquets through. The parpose of this study was to correlate the Fastings of histoiry, physical superioration, and closed remainer options with her-

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Clinical Presentation, Classification, and Outcomes of Cardiogenic Shock in Children

Rotti Pari, MBBS,^{1,6} Loob C. Jertzner, MD,¹ Joseph A. Spinner, MD,¹ Kyle D. Hope, MD, MS,¹ Da Adachi, MD,¹ Sebastian C. Tame, MD,¹ Bari P. Tamignotia, MD, MPR,¹ Swatt Choudley, MD,¹ Antonio G. Caberea, MD,¹ Jack F. Nico, MD¹

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ARSTRACT

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BACKGROUND Despite growing cardiogenic shock (CS) research in adults, the epidemiology, clinical features, and occorrect chickness and concorrect chickness and concorrect of chickness and CS are backing.

OBJECTIVES This study sought to describe the epidemiology, clinical presentation, hopital course, risk factors, and rationnes of CS among clikben hospitalized for scare decompensated heart fallare (ADI-P).

METHODS We examined consecutive ADHF hospitalizations (-(2) years of age) from a large single-center retrospective unitarit. Prevents with CS are greaterization were analyzed and into factors for CS and for the primary outcome of in-hospital sortiality were identified. A modified Society for Cardionaccular Anging only and Interventions shock classification was unstelled and patients were stupped accordingly.

REBULTE A table of BIOI hospitalizations for ADHF were identified in 59% unique patients (headian agr 7.8 press), CS occurred in 207 (DHS) hospitalizations. ADHF hospitalizations with CS were characterised by wone systolic function (P = 0.040), higher 8-type nativents apptide transmittation (D = 0.040), higher 8-type nettration (D = 0.040), higher 8-type nativents and schemal approx (S = 0.040), higher 8-type nativents applied to the table transmittation (D = 0.040), higher 8-type nativents applied to the table transmittation (D = 0.040), higher 8-type nativents applied to the table transmittation (D = 0.040), higher 8-type nativents and table transmittations (D = 0.040), higher 8-type nativents applied to the table transmittation (D = 0.040), higher 8-type nativents applied to the table transmittation (D = 0.040), higher 8-type nativents applied transmittations (D = 0.040), higher 8-type nativents applied to the table transmittation (D = 0.040), higher 8-type nativents applied to the table transmittation (D = 0.040), higher 8-type nativents applied to the table transmittation (D = 0.040), higher 8-type nativents applied tran

CONCLUSIONS C3 course in 20% of petionic hospitalizations for ADHF and is adoptedirely associated with hospital montality. A modified Society for Cardioussicalar Angiography and Internentions classifications for C3 serverty showed rebust association with increasing montality. (J Am Coll Cardiol 2024;83:995–608) © 2024 by the American College of Cardiology Frankerism.

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- Largest pediatric study on CS
- ~600 patients
- Applied the SCAI definitions to children (<21 years)
- CS= ADHF due to Ventricular dysfunction + 2 of the following:
 - a. Lactate >2 mmol/L
 - b. Cool to touch
 - c. Systemic hypotension <5th
 - d. CPR within 24 hr-admit

SCAI CLASSIFICATION FOR CS SEVERITY

CE Store Medified SCAL Definition		
C3 Stage	Modified SCAT Demittion	
Stage A: "at risk"	Children with ADHF who are hemodynamically stable with normal perfusion but are at risk of developing CS	
Stage B: "beginning"	Children with ADHF who are hypotensive OR: require treatment with vasoactive medications but have normal perfusion	
Stage C: "classic"	Children with ADHF and CS who are hypotensive AND receive treatment with vasoactive medications OR: display features of hypoperfusion (ie, cool extremities or lactate >2 mmol/L)	
Stage D: "deteriorating"	Children with ADHF and CS whose hemodynamic instability requires >2 vasoactive medications or mechanical circulatory support	
Stage E: "extremis"	Children with ADHF and CS with overt circulatory collapse necessitating cardiopulmonary resuscitation	
ADHF = acute decompensated heart failure; CS = cardiogenic shock; SCAI = Society for Cardiovascular Angiography and Interventions.		

CS STAGE AND MORTALITY

D

CS Stage	Study Definition
Stage A "At risk"	No hypotension, no vasoactive agents, no other criteria for CS
Stage B "Beginning"	Hypotension OR vasoactive agents without other criteria for CS
Stage C "Classic"	Hypotension AND vasoactive agents OR other criteria for CS
Stage D "Deteriorating"	MCS or >2 vasoactive agents
Stage E "Extremis"	Circulatory collapse with CPR

Inpatient Mortality Rates by CS Stage at 24 Hours



Puri K, et al. J Am Coll Cardiol. 2024;83(5):595-608.

CHARACTERISTICS+OUTCOMES



OUTCOMES



Kaptan-Meier figure depicting estimates of 90-day in-hospital survival for individual children admitted in acute decompensated heart falure with and without cardiogenic shock, including only most recent hospitalization, camored at time of hospital discharge. Approximately one-half of CS deaths occurred within 2 weeks of admission. The shaded areas indicate the confidence intervals. Abbreviations as in Figures 1 and 2.



Importantly, 74% of hospitalizations with CS that received MCS survived to hospital discharge, similar to the survival rate of cases without MCS (80%)

CARDIOLOGY 2024 Mechanical Left Ventricular Unloading in Patients Undergoing Venoarterial Extracorporeal Membrane Oxygenation

Original Investigation

E. Wilson Grandin, Jose I. Nunez, Brooks Willar, Kevin Kennedy, Peter Rycus, Joseph E. Tonna, Navin K. Kapur, Shahzad Shaefi, and A. Reshad Garan

J Am Coll Cardiol. 2022 Apr, 79 (13) 1239-1250

Editorial Comment: ECMO: We Need to Vent About the Need to Vent!*

- ELSO registry for adults receiving peripheral VA-ECMO from 2010 to 2019
- Stratified by MU with IABP or pVAD.
- Primary outcome was in-hospital mortality; secondary outcomes included on-support mortality and complications during VA-ECMO
- Results: 12,734 VA-ECMO patients, 3,399 (26.7%) received MU: 2,782 (82.9%) IABP and 580 (17.1%) pVAD.
- Conclusions: VA-ECMO, MU associated with lower inhospital mortality despite increased complications including hemolysis and cannulation site bleeding. Compared to pVAD, MU with IABP was associated with similar mortality and lower complication rates.

CENTRAL ILLUSTRATION: Left Ventricular Mechanical Unloading during Venoarterial Extracorporeal Membrane Oxygenation: Temporal Trends and Association With Outcomes





MYOCARDIAL RECOVERY FROM DECOMPRESSION



LESSONS FOR THE CLINICIAN

- Chest XRAY appearance cannot accurately predict PCWP
- CS has high mortality in children
- Stages of CS change during hospital admission
- Survival to discharge of children presenting with CS who need MCS is similar to children who do not
- Mechanical unloading is important is there going to be any hope of myocardial recovery
- Mechanical unloading improves outcomes in patient on peripheral VA ECMO







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EXPERT CONSENSUS DOCUMENT

2015 SCAI/ACC/HFSA/STS Clinical Expert Consensus Statement on the Use of Percutaneous Mechanical Circulatory Support Devices in Cardiovascular Care

Endorsed by the American litert Association, the Cardiological Society of India, and Sociodad Latino Americana de Cardinlegia intervenciose. Affirmation of Value by the Canadian Association of Interventional Cardiology Association Canadiances de Cardiologie d'Intervention*

Visian Danie, MD*

PACCE

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MOTOR ROLL, ME, MSCAL FROCT Interventions (ICAI), Heart Failure Risk N. Gaven, MD, FSCAL FACC" Society of America (HPSA), Society Jamas A. Goldstein, MD, FSCAL of Thoracte Surgroom (STS), American Hoart Accentation (Alla). and American Gallege of Cardiology Thomas Tu. MD 7, From the Society (ACD) Fit Cardornsmiter Angiography and

ABSTRACT

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- Cardiogenic shock (CS): is systemic tissue hypoperfusion secondary to inadequate cardiac output despite adequate circulatory volume and LV filling pressure
- Diagnostic hemodynamic criteria: a SBP<90 mm Hg for **>30 min**; a **MAP>30** mm Hg below baseline, with a cardiac index (CI) <1.8 L/min/m2 without hemodynamic support or <2.2 L/min/m2 with support; and a PCWP >15 mm Hg
- The optimal timing of MCS insertion in ADHF and CS remains unknown. For patients with advanced HF, the INTERMACS has defined seven clinical profiles before implantation of a surgical VAD. Cardiogenic shock is identified by INTERMACS profiles 1 and 2



Figure 1. Definition, retrospective adjudication, and distribution of Society for Cardiovascular Angiography and Interventions (SCAI) stages within the Cardiogenic Shock Working Group (CSWG) registry.

CS indicates cardiogenic shock.

Left Atrial Decompression in Pediatric Patients Supported With Extracorporeal Membrane Oxygenation for Failure to Wean From Cardiopulmonary Bypass: A Propensity-Weighted Analysis

Francesca Sperotto, MD, PhD (10); Angelo Polito, MD, MPH; Angela Amigoni, MD (10); Nicola Maschietto, MD, PhD (10); Ravi R. Thiagarajan, MBBS, MPH

- 2915 patients supported with venoarterial ECMO for failure to wean from cardiopulmonary bypass
- 1508 had biventricular physiology and 279 (18%) underwent LA decompression (LA+)

Conclusion: LA decompression independently decreased the risk of in-hospital adverse outcome in pediatric venoarterial ECMO patients who failed to wean from cardiopulmonary bypass, suggesting that these patients may benefit from LA decompression.

ARE CHEST RADIOGRAPHS USEFUL?

- Unlikely to be better than physical examination in defining serious vs. benign heart disease
- Unlikely to give precise anatomic diagnosis
- Good to exclude lung pathology
- Good if concern is high and echo is not available



10/24 Study















AN IMAGE IS WORTH A 1000 WORDS...



CARDIOLOGY 2024









CASE

- 14 y.o. female with controlled epilepsy and a strong FH of CHF who presented to an OSH ED 2 days ago with cough and concern for PNA.
- In the OSH ED she was given an IVF bolus and she arrested. She received 35 minutes of CPR with an unknown amount of epi. She was transferred to OSH. She was intubated and escalated on vasoactives (epinephrine and milrinone), initially in the PICU.

CASE

- She then had a 3 minute arrest, with CPR and ROSC and was then peripherally cannulated in the right femoral artery (19F) with an a 7F retrograde perfusion line, and femoral vein (23F) on 7/7/19. No issues with cannulation per report with flows ~3.9-4.5L/min.
- She was cooled per the adult hypothermia for cardiac arrest protocol (patient was located in the adult ICU after ECMO initiation) and then gently rewarmed per protocol

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CARDIOLOGY 2024

URIGINAL ARTIGLE

Invasive Hemodynamic Assessment and Classification of In-Hospital Mortality Risk Among Patients With Cardiogenic Shock **30% mortality**

Katherine L. Thayer, MPH; Elric Zweck; Mohyee Ayouty, MS; A. Reshad Garan^O, MD; Jaime Hernandez-Montfort, MD, MPH; Claudius Mahr, DO; Kevin J. Morine, MD; Sarah Newman, BS; Lena Jorde, BS; Jillian L. Haywood, MS; Neil M. Harwani, MS; Michele L. Esposito, MD; Carlos D. Davila, MD; Detlef Wencker, MD; Shasharik S. Sinha, MD, MSc; Esther Vorovich, MD; Jacob Abraham, MD; William O'Neil, MD; James Udelson, MD; Daniel Burkhoff^O, MD, PhD; Navin K. Kapur^O, MD

BACKGROUND: Risk stratifying patients with cardiogenic shock (CS) is a major unmet need. The recently proposed Society for Cardiovascular Angiography and Interventions (SCAI) stages as an approach to identify patients at risk for in-hospital mortality remains under investigation. We studied the utility of the SCAI stages and further explored the impact of hemodynamic congestion on clinical outcomes.

METHODS: The CS Working Group registry includes patients with CS from 8 medical centers enrolled between 2016 and 2019. Patients were classified by the maximum SCAI stage (B–E) reached during their hospital stay according to drug and device utilization. In-hospital mortality was evaluated for association with SCAI stages and hemodynamic congestion.

RESULTS: Of the 1414 patients with CS, the majority were due to decompensated heart failure (50%) or myocardial infarction (MI; 35%). In-hospital mortality was 31% for the total cohort, but higher among patients with MI (41% versus 26%, MI versus heart failure, P<0.0001). Risk for in-hospital mortality was associated with increasing SCAI stage (odds ratio [95% CI], 3.25 [2.63–4.02]) in both MI and heart failure cohorts. Hemodynamic data was available in 1116 (79%) patients. Elevated biventricular filling pressures were common among patients with CS, and right atrial pressure was associated with increased mortality and higher SCAI Stage.

CONCLUSIONS: Our findings support an association between the proposed SCAI staging system and in-hospital mortality among patient with heart failure and MI. We further identify that venous congestion is common and identifies patients with CS at high risk for in-hospital mortality. These findings provide may inform future management protocols and clinical studies.

Key Words: cardiogenic shock # heart failure # hemodynamics # hospital mortality # myocardial infarction # right atrial pressure # ventricular congestion



Theyer et al.

Figure 3. Device usage among Cardiogenic Shock Working Group (CSWG) patients with svalialish hemodynamic data among the entire study cohort and each Society for Cardiovascular Angiography and Interventions (SCA) stage. AICS indicates scult recharged circulatory separt; ECMO, entropyonal immotions experiment, and WJP, intraactic balloor pump.