63° CONGRESSO NAZIONALE SIGG

GLI ANZIANI:
LE RADICI DA PRESERVARE

ROMA 28 novembre 01 dicembre 2018 Auditorium della Tecnica, Roma

Università degli Studi della Campania *Luigi Vanvitelli*

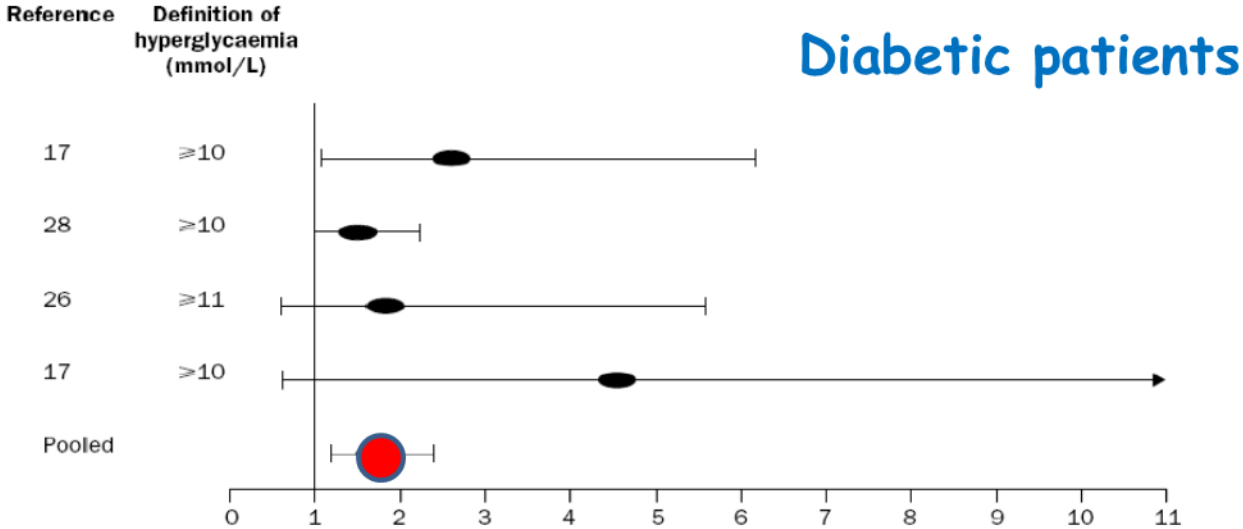
Ruolo del controllo glicemico sugli outcomes delle sindromi coronariche acute

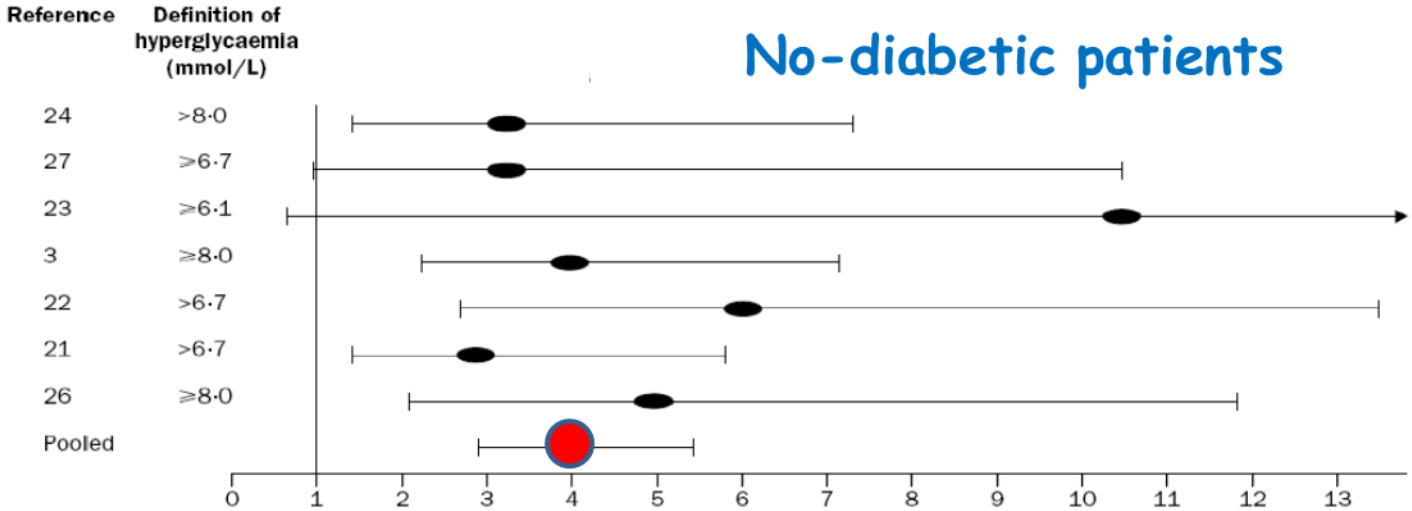
Raffaele Marfella

L'iperglicemia durante IMA aumenta la mortalità intra-ospedaliera

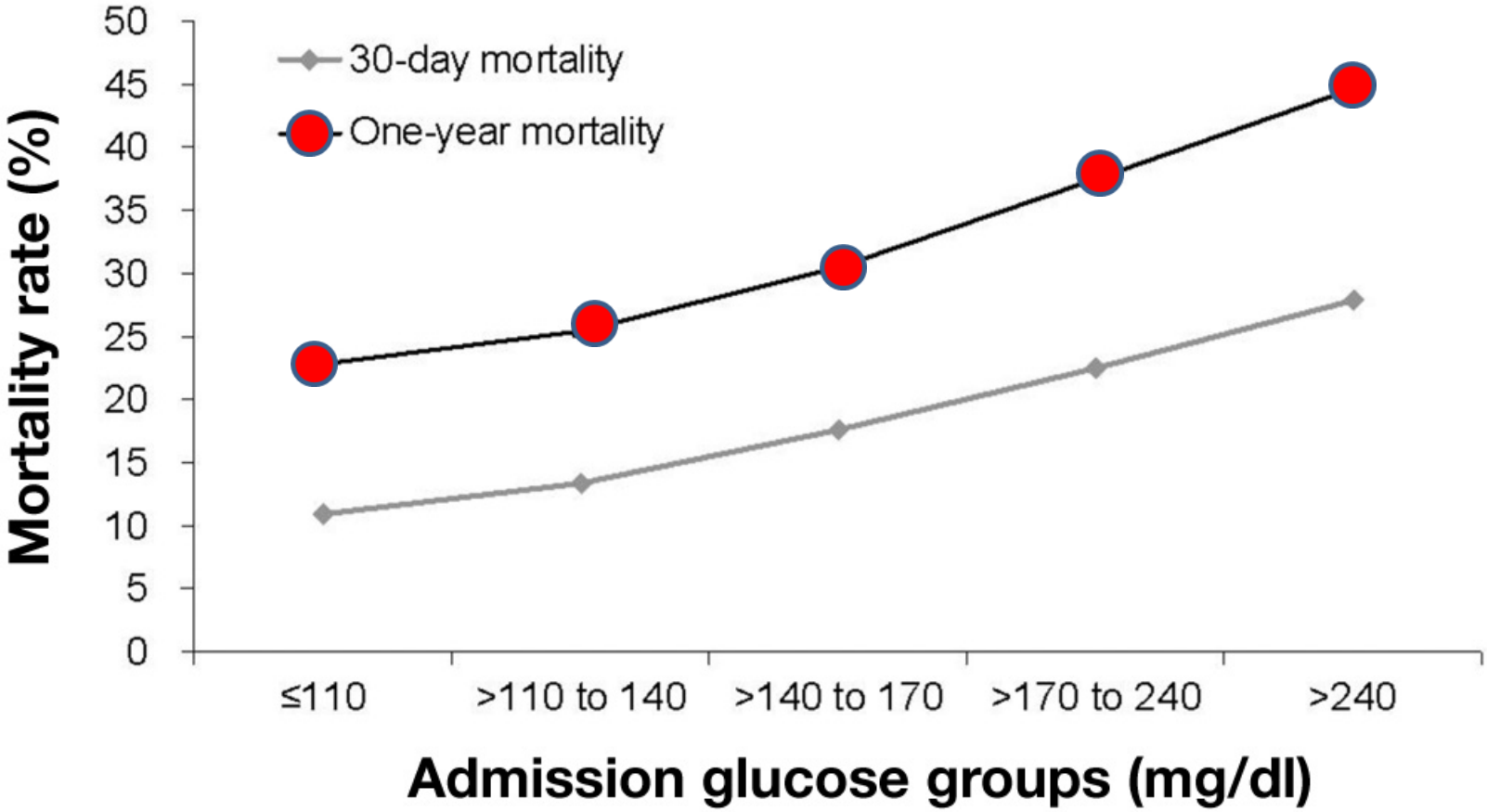
6374 patients

Sarah Capes et al. Lancet 2000





Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION
American Heart Association
Learn and Live
AHA Scientific Statement
2008;117:1610-1619.



European Heart Journal – Cardiovascular Pharmacotherapy (2015) 1, 220–228
doi:10.1093/ehjcvp/pvv023

Meta-analysis of admission hyperglycaemia in acute myocardial infarction patients treated with primary angioplasty: a cause or a marker of mortality?

Kuljit Singh[1,2*], Benjamin Hibbert[1], Balwinder Singh[3], Kristin Carson[2], Manuja Premaratne[1], Michel Le May[1], Aun-Yeong Chong[1], Margaret Arstall[4], and Derek So[1]

Study or Subgroup	Hyperglycemia Events	Hyperglycemia Total	Euglycemia Events	Euglycemia Total	Weight	Risk Ratio M-H, Random, 95% CI
16.1.1 > 1 year						
Gasior 2008	81	667	27	643	20.0%	2.89 [1.90, 4.41]
Timmer 2011	132	2024	64	2108	27.1%	2.15 [1.60, 2.88]
Subtotal (95% CI)		**2691**		**2751**	**47.1%**	**2.39 [1.81, 3.17]**
Total events	213		91			
Heterogeneity: Tau² = 0.01; Chi² = 1.29, df = 1 (P = 0.26); I² = 23%						
Test for overall effect: Z = 6.10 (P < 0.00001)						
16.1.2 > 3 year						
Hoebers 2011	81	899	44	747	23.5%	1.53 [1.07, 2.18]
Planer 2013	130	1141	95	2264	29.4%	2.72 [2.10, 3.50]
Subtotal (95% CI)		**2040**		**3011**	**52.9%**	**2.07 [1.18, 3.63]**
Total events	211		139			
Heterogeneity: Tau² = 0.14; Chi² = 6.66, df = 1 (P = 0.010); I² = 85%						
Test for overall effect: Z = 2.53 (P = 0.01)						
Total (95% CI)		**4731**		**5762**	**100.0%**	**2.26 [1.73, 2.94]**
Total events	424		230			
Heterogeneity: Tau² = 0.05; Chi² = 8.07, df = 3 (P = 0.04); I² = 63%						
Test for overall effect: Z = 6.01 (P < 0.00001)						
Test for subgroup differences: Chi² = 0.21, df = 1 (P = 0.65), I² = 0%						

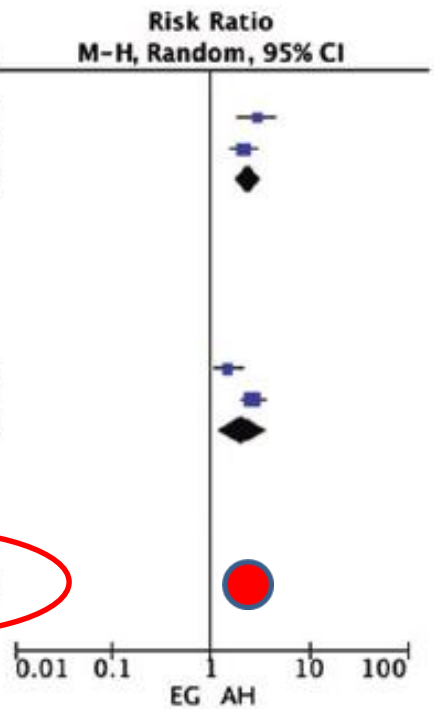
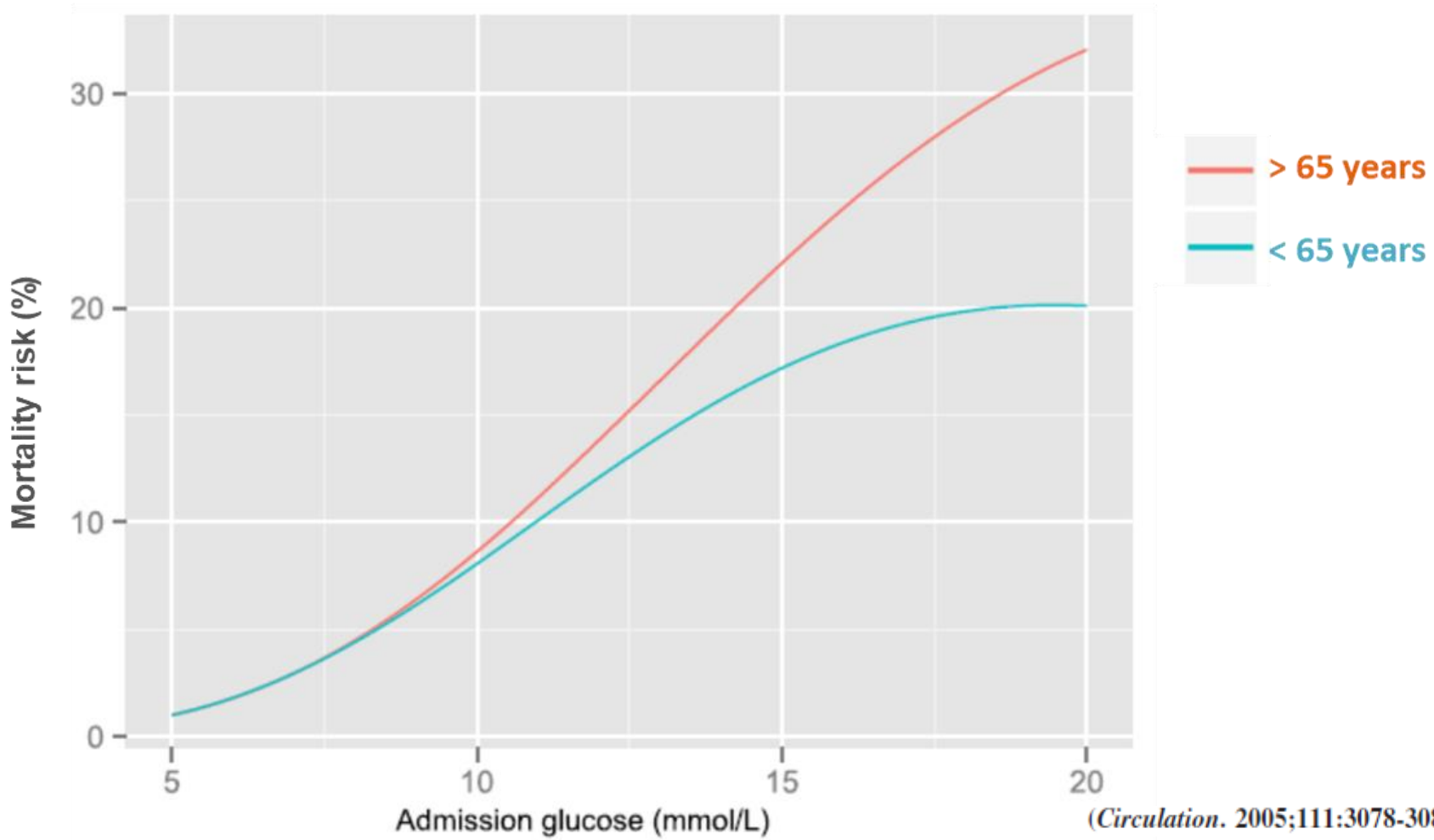


Figure 4 A subgroup analysis showing the presence of higher number of death in the admission hyperglycaemia group during long-term follow-up.

Admission Glucose and Mortality in Elderly Patients Hospitalized With Acute Myocardial Infarction

Implications for Patients With and Without Recognized Diabetes

Mikhail Kosiborod, MD; Saif S. Rathore, MPH; Silvio E. Inzucchi, MD; Frederick A. Masoudi, MD; Yongfei Wang, MS; Edward P. Havranek, MD; Harlan M. Krumholz, MD, SM



(*Circulation*. 2005;111:3078-3086.)

Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION
American Heart Association®
Learn and Live℠

Glucose-Lowering Targets for Patients With Cardiovascular Disease : Focus on Inpatient Management of Patients With Acute Coronary Syndromes

Mikhail Kosiborod and Darren K. McGuire

Definition of Acute Hyperglycemia

- admission or random **glucose level >140 mg/dL**

Dimensioni del problema

- **31–48%** of patients with ACS were hyperglycemic.
- **>50%** of patients with ACS who are hyperglycemic do not have known diabetes
- **60-68%** of hyperglycemic patients with acute coronary syndrome are over 65 years of age

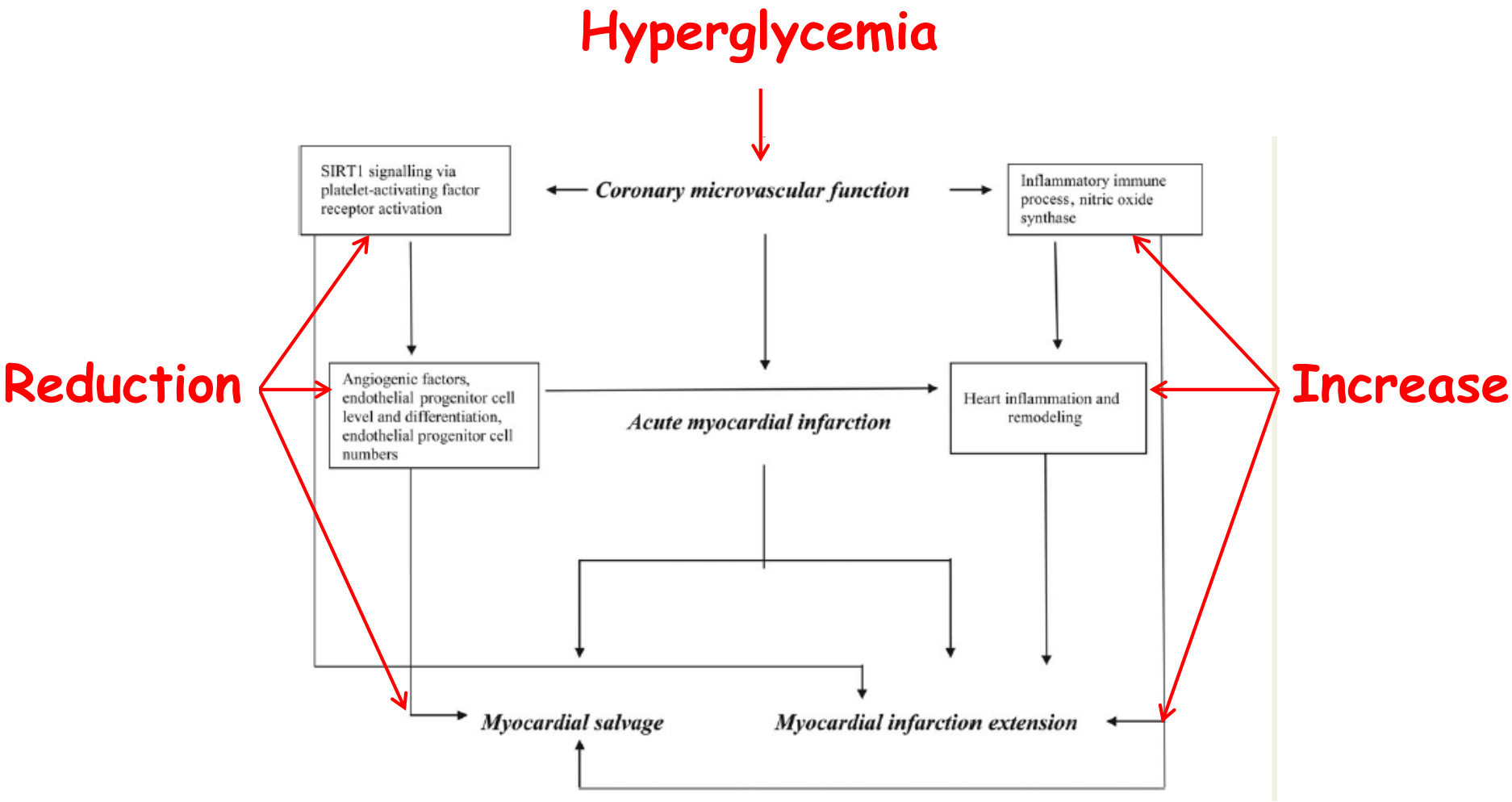
2010, 122:2736-2744

European Heart Journal – Cardiovascular Pharmacotherapy (2015) 1, 229–231
doi:10.1093/ehjcvp/pvv027

INVITED EDITORIAL
Acute coronary syndromes

Glycemic control and acute coronary syndrome: the debate continues

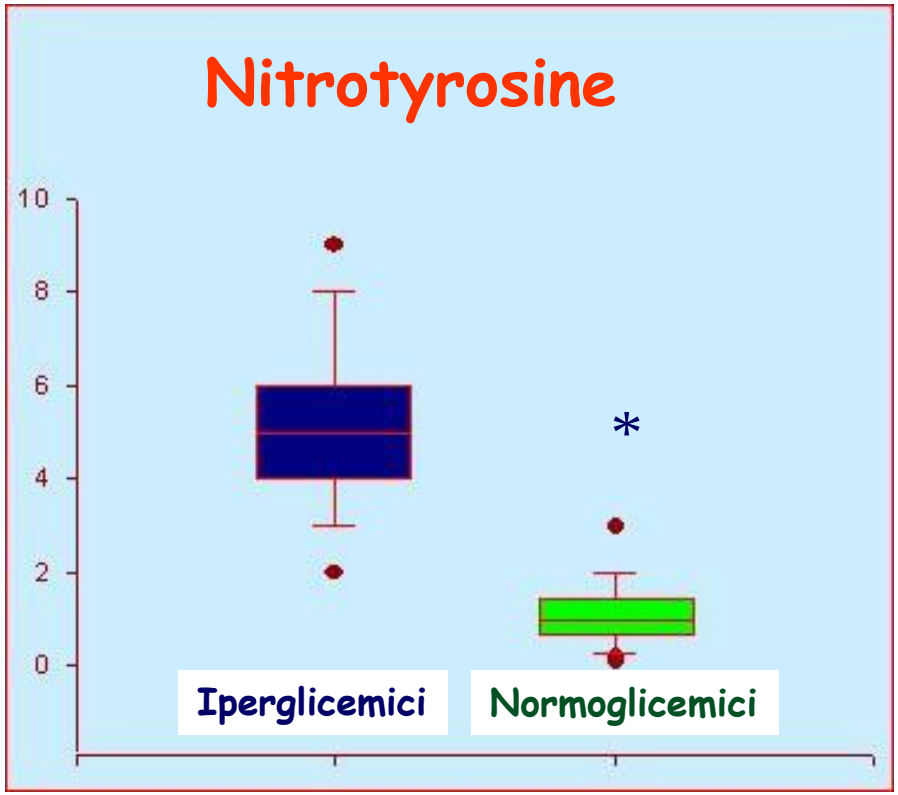
Raffaele Marfella* and Giuseppe Paolisso

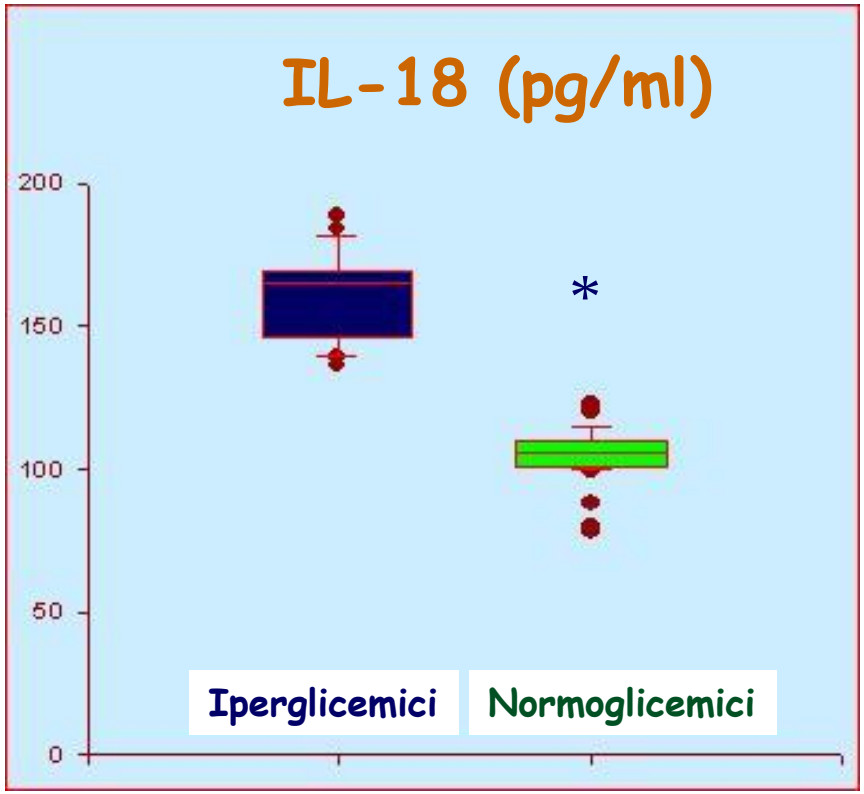


DiabetesCare

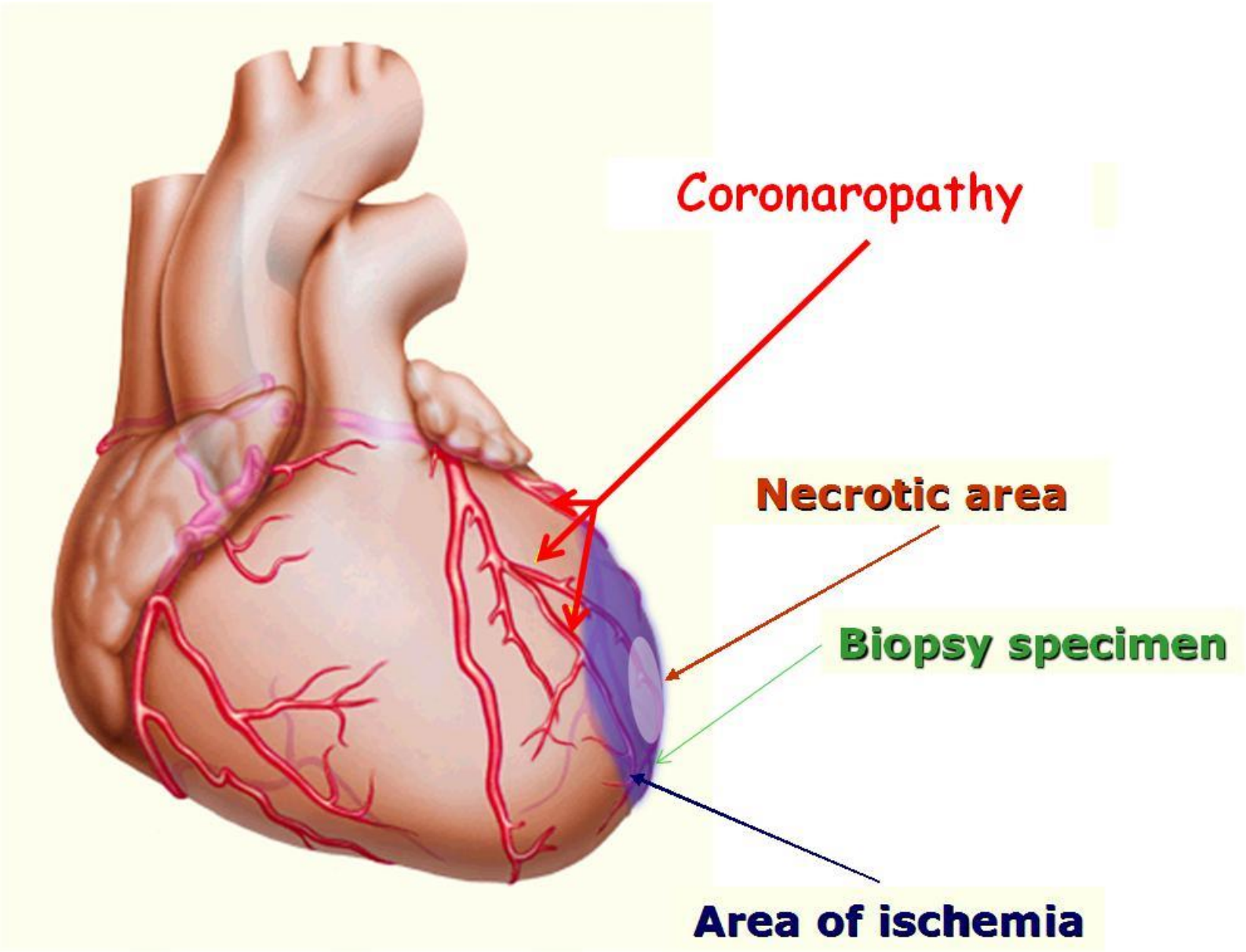
Marfella R et al.

L'IPERGLICEMIA DURANTE INFARTO ACUTO DEL MIOCARDIO SI ASSOCIA AD UN AUMENTO DELLO STRESS OSSIDATIVO E DELL'INFIAMMAZIONE SISTEMICA





26:3129-3135, 2003

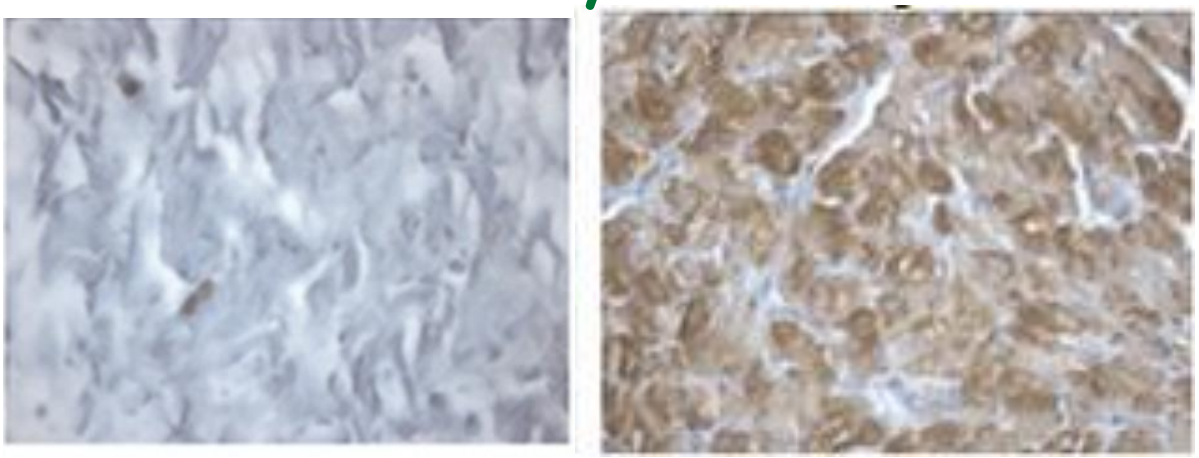

Coronaropathy
Necrotic area
Biopsy specimen
Area of ischemia

Journal of the American College of Cardiology Vol. 53, No. 16, 2009

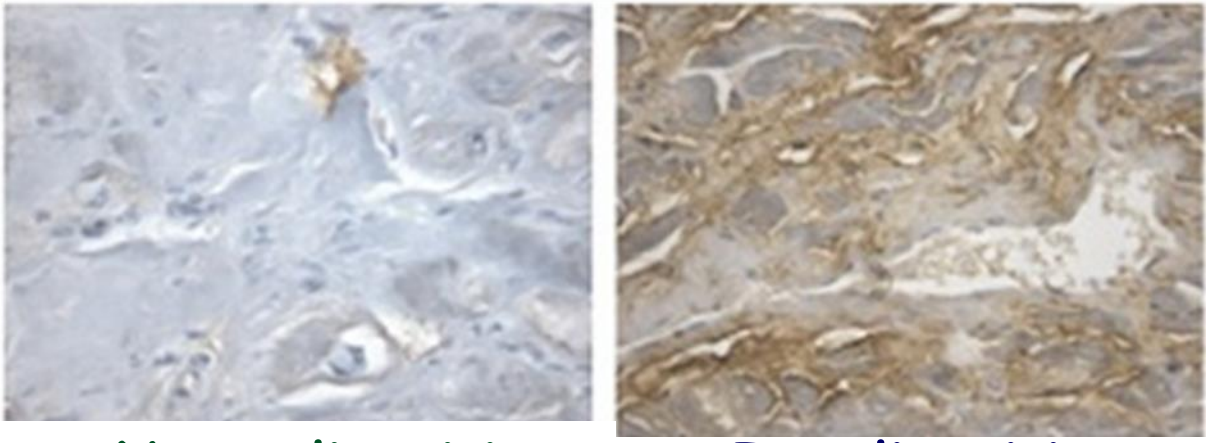
Marfella R et al.

L'IPERGLICEMIA DURANTE INFARTO ACUTO DEL MIOCARDIO SI ASSOCIA AD UN AUMENTO DELLO STRESS OSSIDATIVO E DELL'INFIAMMZIONE NEL TESSUTO PERINFARTUALE

Nitrotyrosine



TNF-alpha

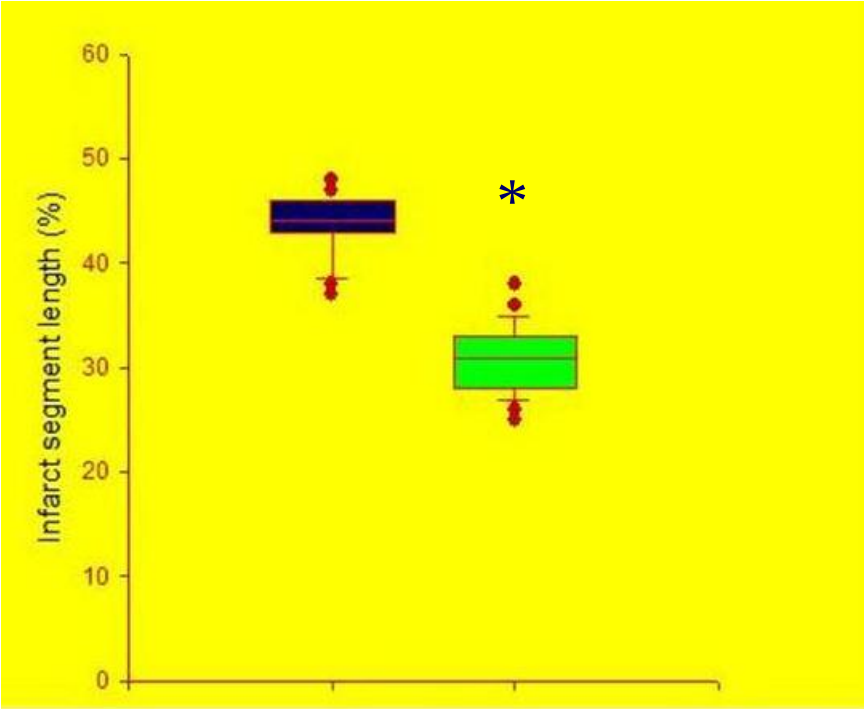


Normoglicemici Iperglicemici

DiabetesCare

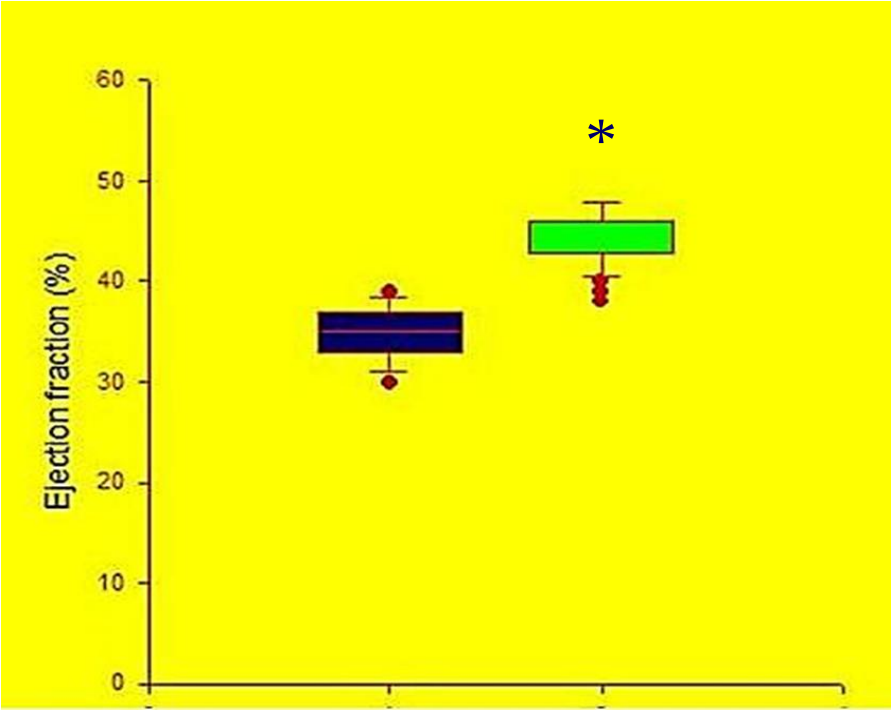
Marfella R et al.

L'iperglicemia durante IMA si associa ad un aumento dell'AREA INFARTUALE, ad una riduzione della FRAZIONE DI EIEZIONE



Hyperglycemic patients

Normoglycemic patients

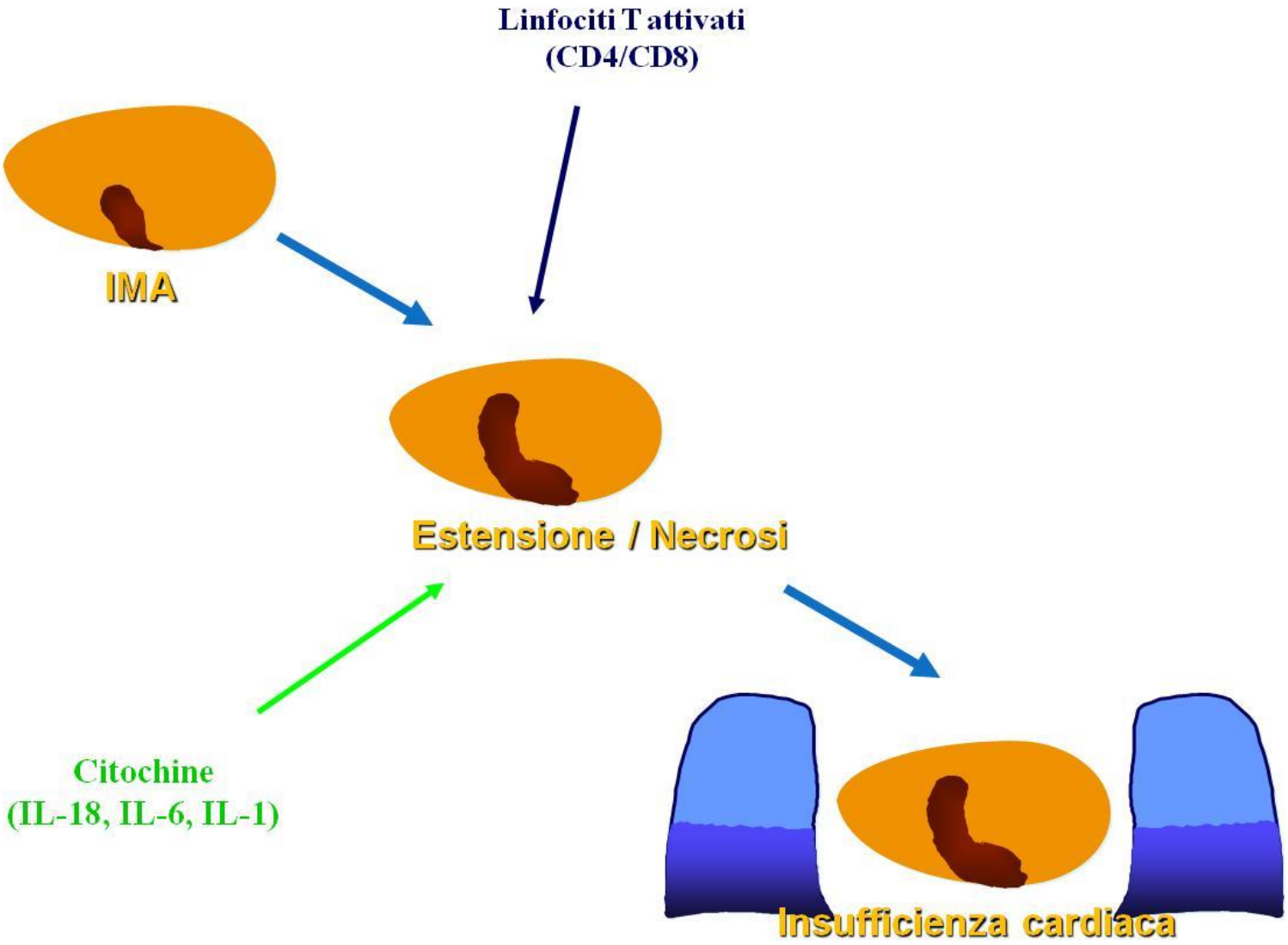


Hyperglycemic patients

Normoglycemic patients

26:3129-3135, 2003

L'incremento dello stress ossidativo e dell'infiammazione nelle prime ore dell'infarto aumentano l'area di necrosi e condizionano il rimodellamento precoce



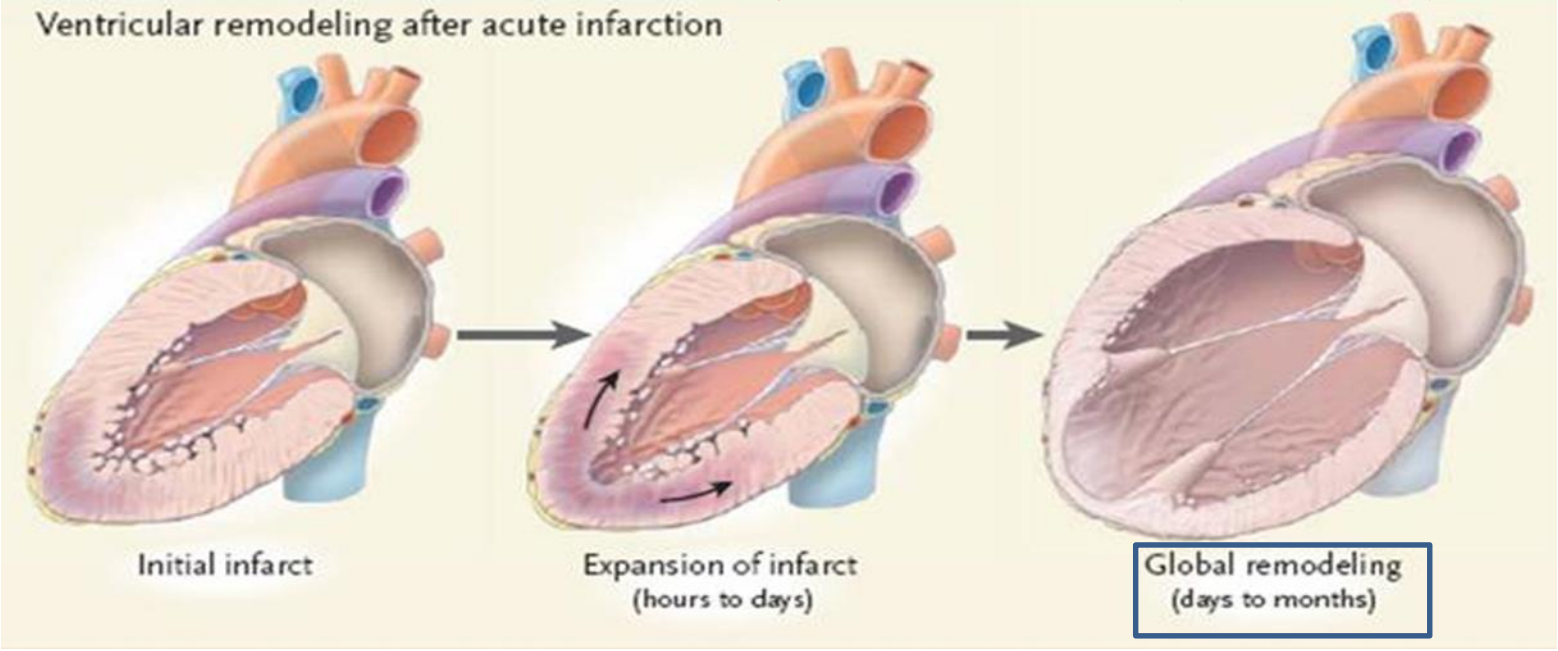
Hyperglycemia

↓

Oxidative stress ↑

↑ Inflammation → Angiogenesis ⇓

Regenerative cells ⇓



diabetes

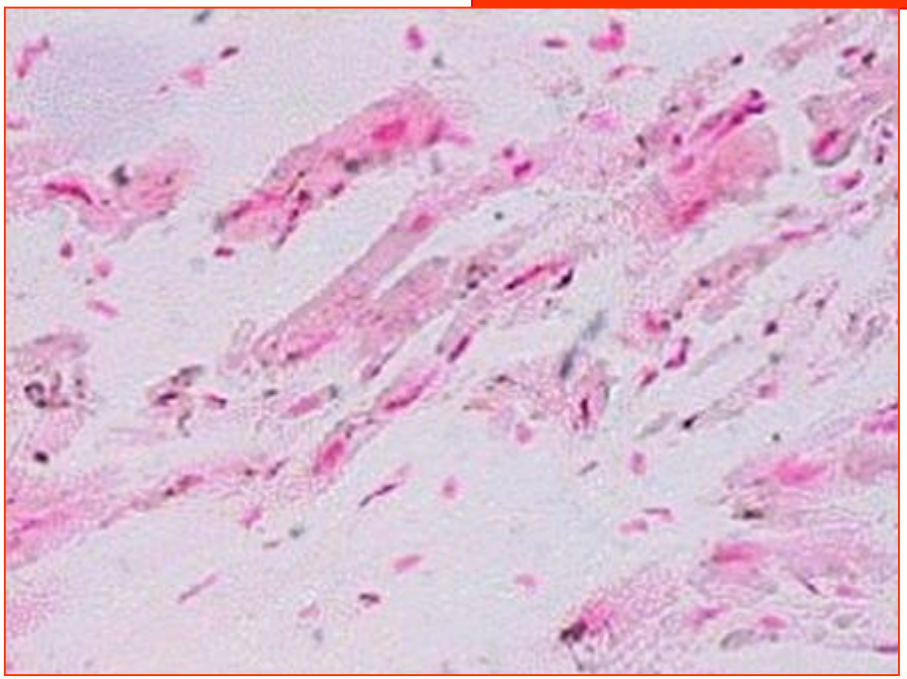
53:2383-2391, 2004

Expression of Angiogenic Factors During Acute Coronary Syndromes in Human Type 2 Diabetes

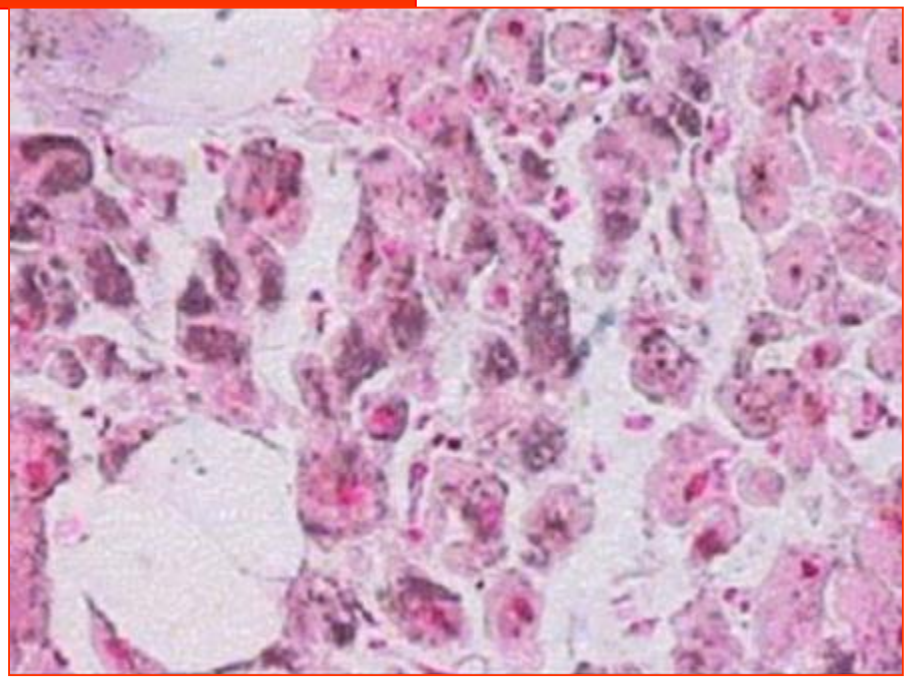
Raffaele Marfella,[1,2] Katherine Esposito,[1,2] Francesco Nappo,[1] Mario Siniscalchi,[1] Ferdinando Carlo Sasso,[1] Michele Portoghese,[3] Maria Pia Di Marino,[4] Alfonso Baldi,[4] Salvatore Cuzzocrea,[5] Clara Di Filippo,[2,6] Guglielmo Barboso,[6] Feliciano Baldi,[4] Francesco Rossi,[2,6] Michele D'Amico,[2,6] and Dario Giugliano[1,2]

L'IPERGLICEMIA DURANTE INFARTO ACUTO DEL MIOCARDIO SI ASSOCIA AD UNA RIDUZIONE DEI FATTORI ANGIOGENETICI NEL TESSUTO PERINFARTUALE

VEGF immunostaining



Hyperglycemic patient



Normoglycemic patient

2012-97 933-942

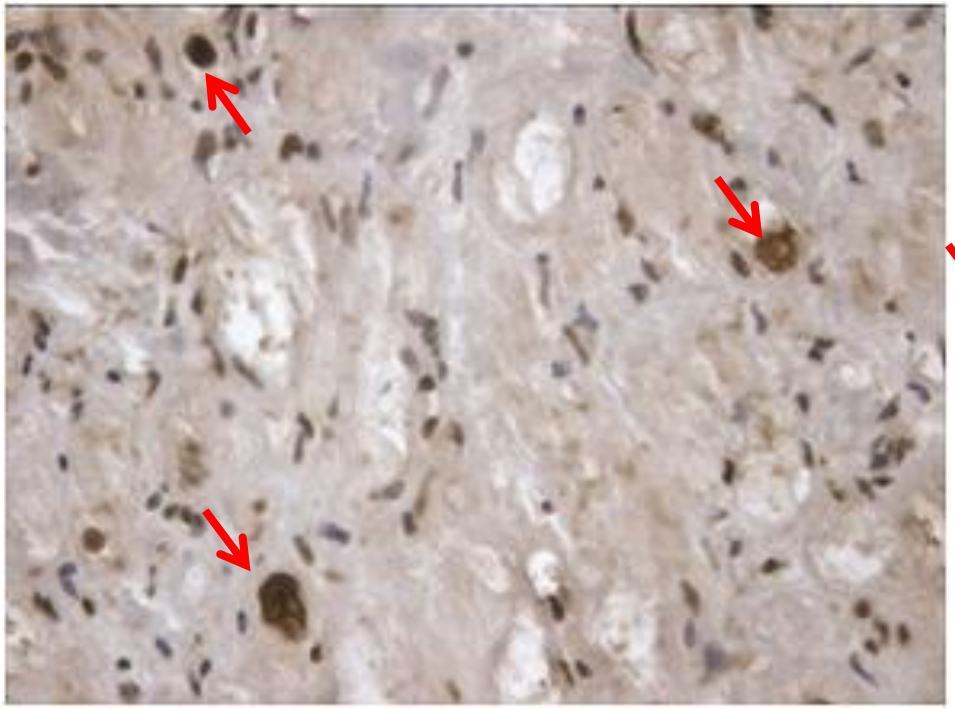
ENDOCRINE RESEARCH

Tight Glycemic Control May Increase Regenerative Potential of Myocardium during Acute Infarction

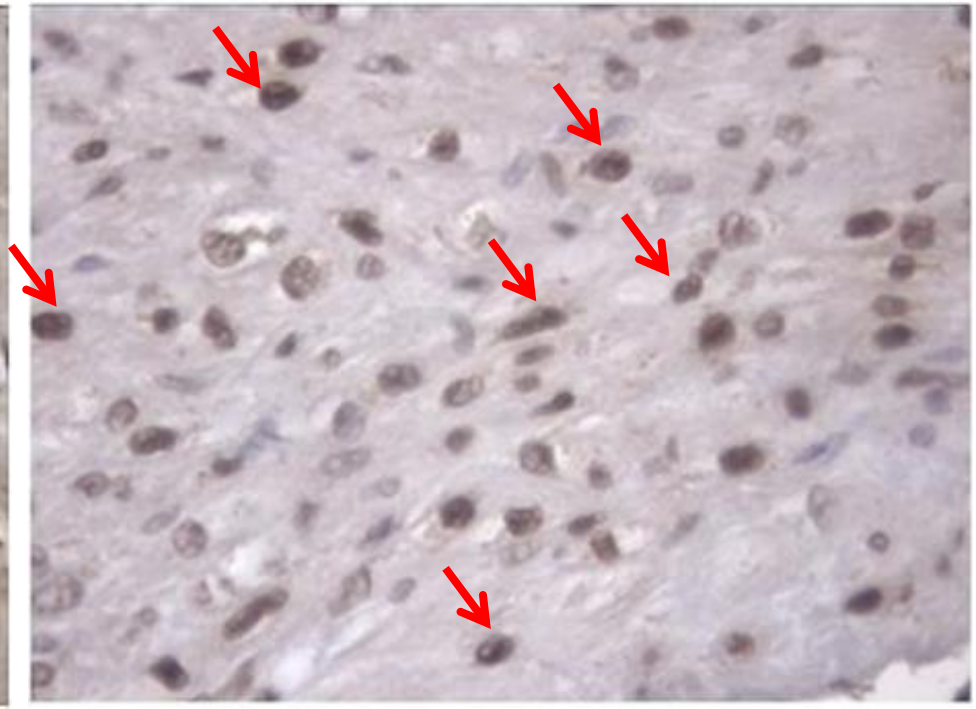
expand article

Raffaele Marfella*, Ferdinando Carlo Sasso*, Federico Cacciapuoti, Michele Portoghese, Maria Rosaria Rizzo, Mario Siniscalchi, Ornella Carbonara, Franca Ferraraccio, Michele Torella, Antonello Petrella, Maria Luisa Balestrieri, Paola Stiuso, Giannantonio Nappi and Giuseppe Paolisso

Ki-67



Hyperglycemic patient



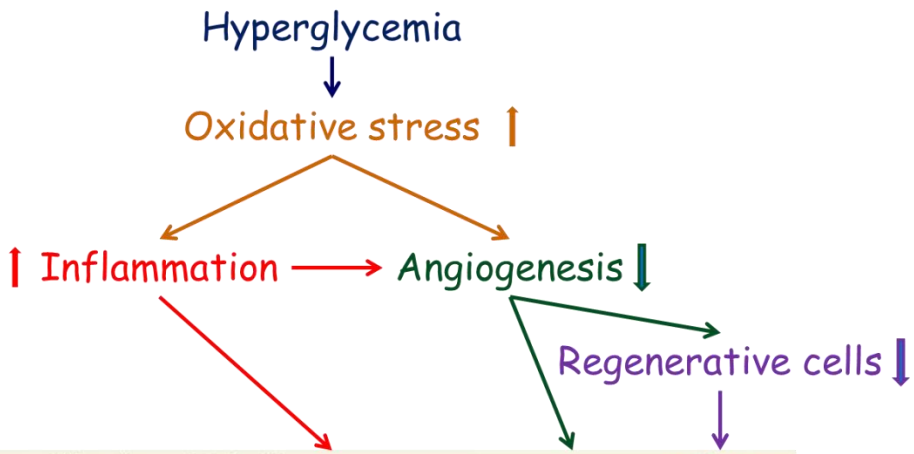
Normo-glycemic patient

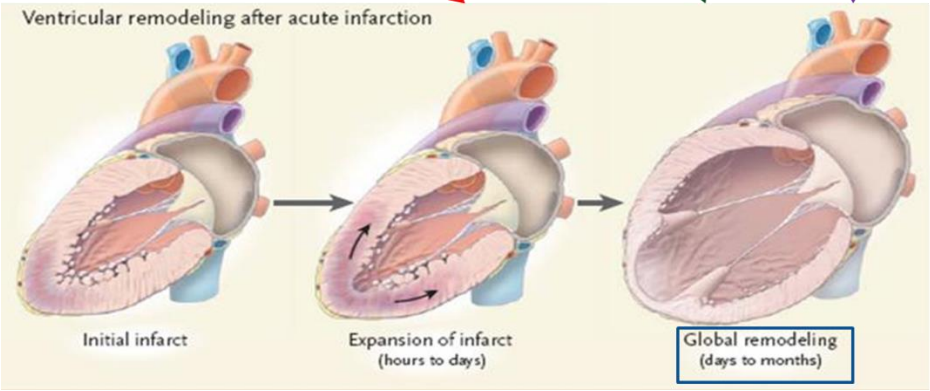
THE LANCET

Stress hyperglycaemia and death after myocardial infarction

*Raffaele Marfella, *Dario Giugliano*
Department of Geriatrics and Metabolic Diseases, Second University of Naples, I-80138 Naples, Italy

THE LANCET • Vol 355 • May 6, 2000





THE JOURNAL OF
CLINICAL ENDOCRINOLOGY
& METABOLISM

CLINICAL REVIEW

Intensive Insulin Therapy in Critically Ill Patients: NICE-SUGAR or Leuven Blood Glucose Target?

Greet Van den Berghe, et al 2010

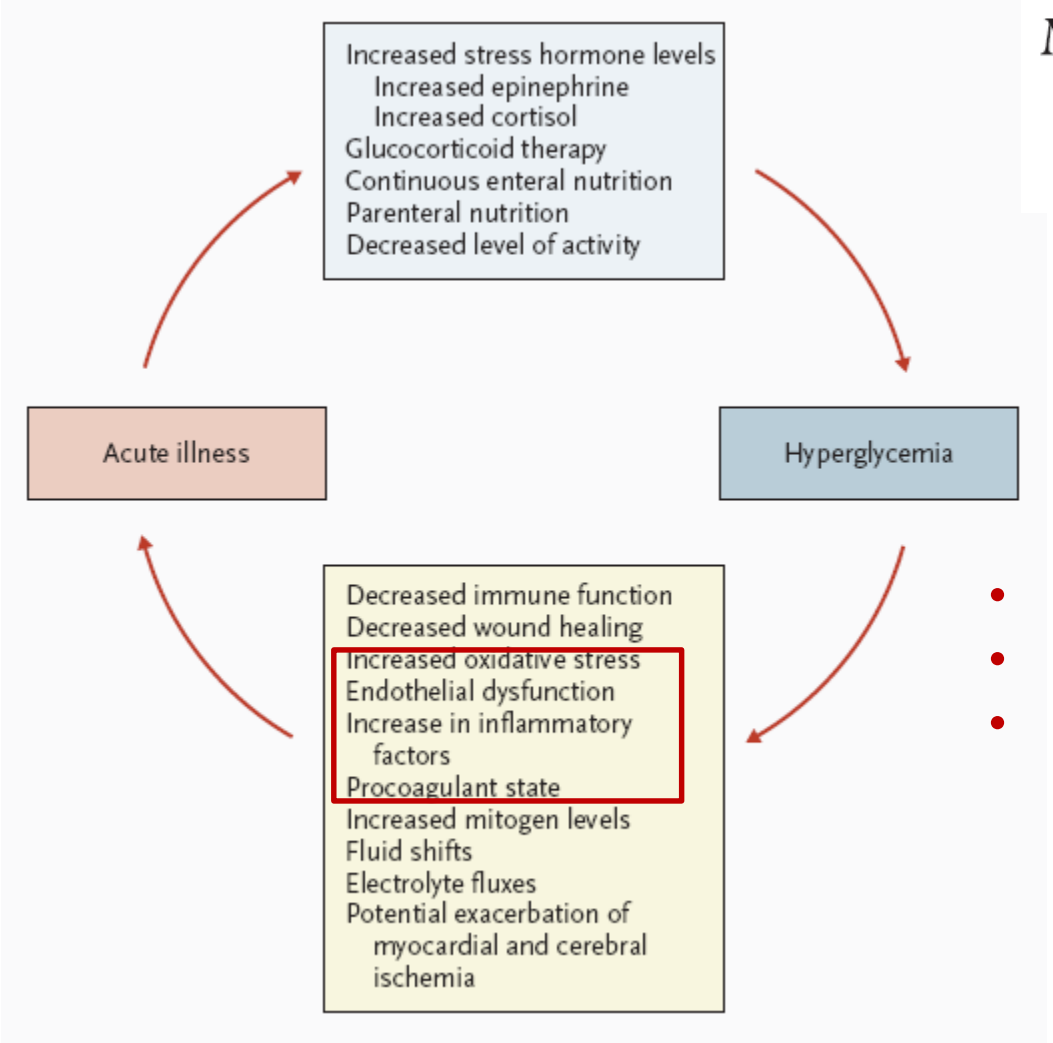
Clinical Implications: Quo Vadis?

Nonostante i dati epidemiologici e fisiopatologici:

- le odierne linee-guida non suggeriscono specifiche **STRATEGIE TERAPEUTICHE** per il controllo glucidico.

- le odierne linee-guida non suggeriscono specifici **TARGET** per il controllo glucidico.

La somministrazione di insulina può ridurre il danno miocardico?



Management of Hyperglycemia in the Hospital Setting

Silvio E. Inzucchi, M.D.

N Engl J Med 2006;355:1903-11.

<----- insulin

- **Modalità di somministrazione**
- **Target**
- **Conoscenza degli effetti sui meccanismi patogenetici**

Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION
American Heart Association
Learn and Live

AHA Scientific Statement

RECOMMENDATIONS

Insulin, administered as an intravenous infusion, is currently the most effective method of controlling glucose among patients hospitalized in the ICU.

Protocollo di YALE

Inizio dell'infusione di insulina

1) INFUSIONE DI INSULINA: miscelare 1 unità di Insulina Umana Regolare per 1 ml di sol. fisiologica 0,9% NaCl (es. 50 U Insulina in 50 ml fisiologica). Somministrare con pompa di infusione (con incrementi di 0,5 U/h)
2) PRIMING: prima di iniziare l'infusione, iniettare 50 ml della soluzione nei tubi di infusione (per saturare i siti di legame insulinico nei tubi)
3) TARGET GLICEMICO:
4) BOLO e VELOCITÀ DI INFUSIONE INIZIALE DELL'INSULINA: dividere GM iniziale per 100, poi arrotondare alla più vicina 0,5 U per il bolo e per la velocità di infusione iniziale.

Esempi: 1) GM iniziale 325 mg/dl: 325:100 5 3,25, arrotondato a 3,5: praticare bolo ev 3,5 U, e iniziare infusione a 3,5 U/h
2) GM iniziale 174 mg/dl: 174:100 5 1,74, arrotondato a 1,5: praticare bolo ev 1,5 U, e iniziare infusione a 1,5 U/h

Monitoraggio della glicemia (GM)

1) Controllare GM ogni ora fino a stabilizzazione (3 rilevazioni consecutive entro il target).

Modificazioni della velocità di infusione dell'insulina

Se GM < <100 mg/dl
STOP INFUSIONE DI INSULINA

2008;117:1610-1619.

THE JOURNAL OF
CLINICAL ENDOCRINOLOGY
& METABOLISM

CLINICAL REVIEW

Intensive Insulin Therapy in Critically Ill Patients: NICE-SUGAR or Leuven Blood Glucose Target?

Greet Van den Berghe, et al 2016

Clinical Implications: Quo Vadis?

TARGET ?

CRITICALLY ILL PATIENTS

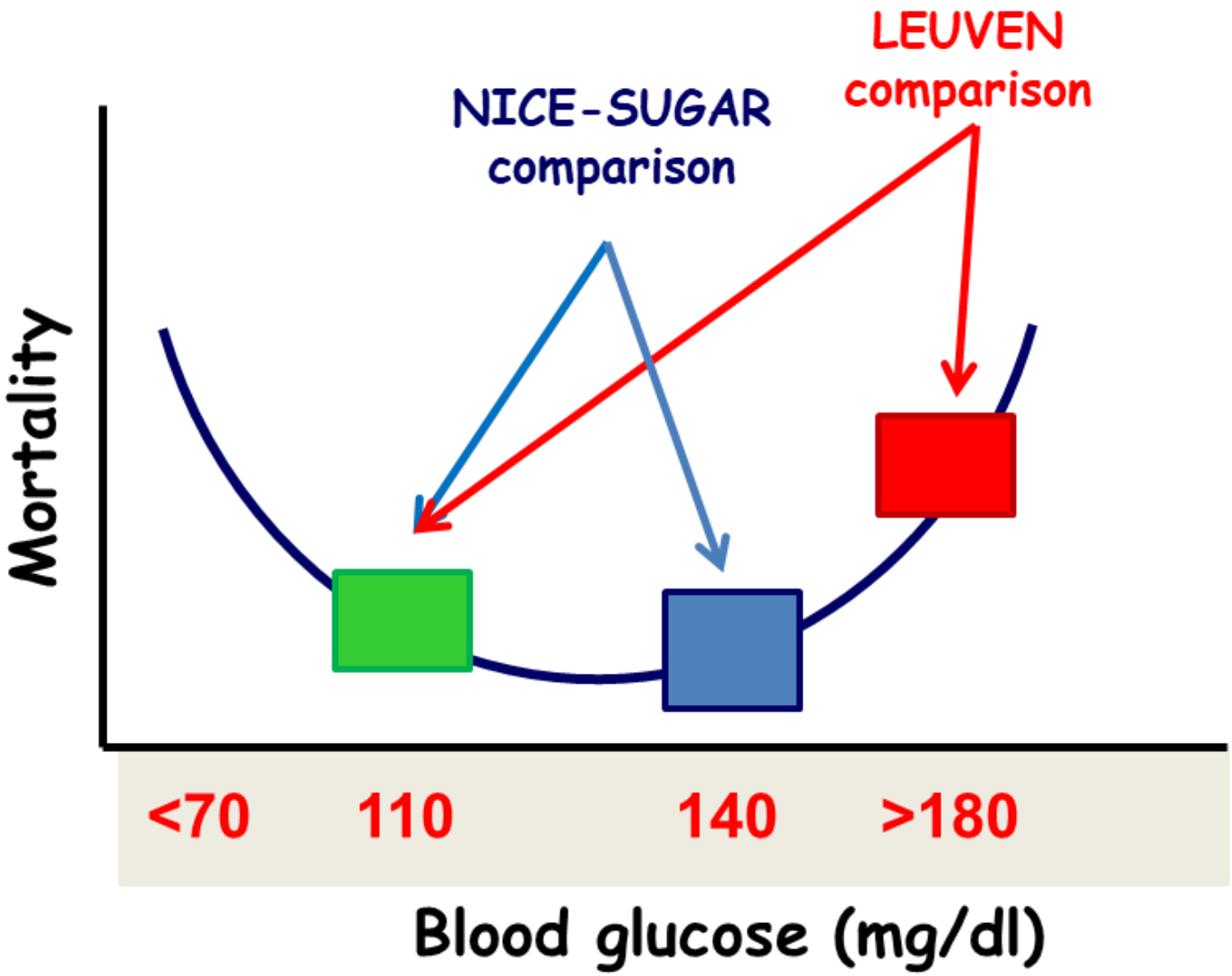
- Van den Berghe N Engl J Med. 2001 Nov 8;345(19):1359-67. 59% CVD
- Nice-Sugar N Engl J Med. 2009 Mar 26;360(13):1283-97. 48% CVD

ACUTE CORONARY SYNDROME PATIENTS

- DIGAMI STUDY. Eur Heart J. 1996 Sep;17(9):1337-44.
- Hi-5 STUDY. Diabetes Care. 2006 Apr;29(4):765-70
- CARDINAL STUDY. Eur Heart J. 1996

Intensive Insulin Therapy in Critically Ill Patients: NICE-SUGAR or Leuven Blood Glucose Target?

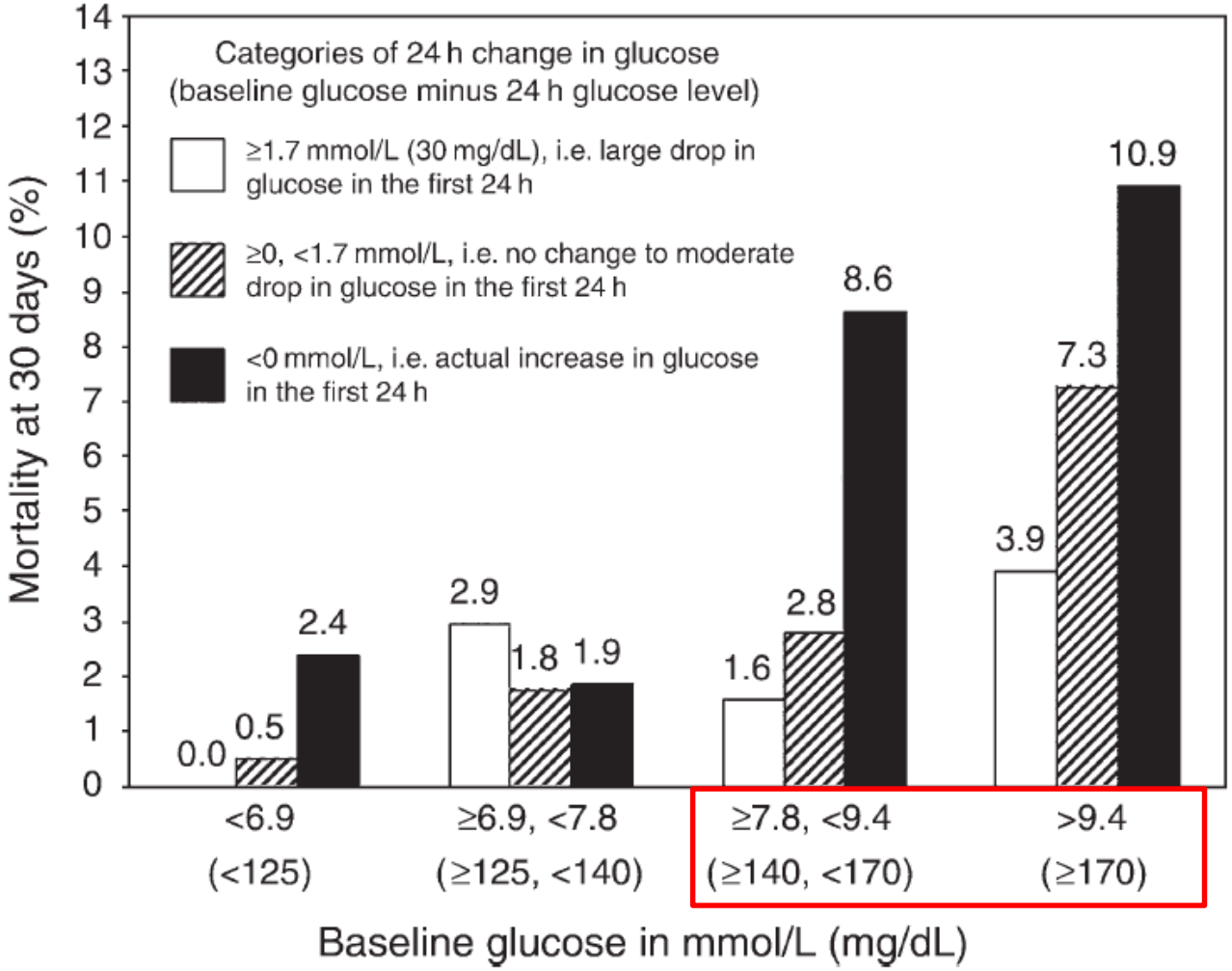
Greet Van den Berghe, et al



Prognostic significance of the change in glucose level in the first 24 h after acute myocardial infarction: results from the CARDINAL study

Abhinav Goyal[1]*, Kenneth W. Mahaffey[1], Jyotsna Garg[1], Jose C. Nicolau[2], Judith S. Hochman[3], W. Douglas Weaver[4], Pierre Theroux[5], Gustavo B.F. Oliveira[6], Thomas G. Todaro[7], Christopher F. Mojcik[8], Paul W. Armstrong[9], and Christopher B. Granger[1]

European Heart Journal (2006) **27**, 1289–1297
doi:10.1093/eurheartj/ehi884



The effect of the 24 h change in glucose on mortality was independent of baseline glucose;

The relation between the 24 h change in glucose and mortality cannot be reliably interpreted for the group of patients with baseline glucose less than 140 g/dL

The NEW ENGLAND JOURNAL of MEDICINE

Glucose Control in the ICU — How Tight Is Too Tight?

Silvio E. Inzucchi, M.D., and Mark D. Siegel, M.D.

Table 1. Summary Data from Randomized Clinical Trials of Intensive Insulin Therapy in Critically Ill Patients.*

Trial Name (Source)†	No. of Patients	Type of ICU	Blood Glucose Level Targeted		Blood Glucose Level Achieved‡		Primary Outcome	Rate of Outcome		Odds Ratio (95% CI)
			Intensive Glucose Control	Conventional Glucose Control	Intensive Glucose Control	Conventional Glucose Control		Intensive Glucose Control	Conventional Glucose Control	
			milligrams per deciliter					*percent*		
Leuven 1 (Van den Berghe et al.[3])	1548	Surgical	80–110	180–200	103	153	Death in ICU	4.6	8.0	0.58 (0.38–0.78)
Leuven 2 (Van den Berghe et al.[4])	1200	Medical	80–110	180–200	111	153	Death in hospital	37.3	40.0	0.94 (0.84–1.06)
Glucontrol (Devos et al.,[5] Preiser J.C.: personal communication)	1101	General	80–110	140–180	118	144	Death in ICU	16.7	15.2	1.10 (0.84–1.44)
VISEP (Brunkhorst et al.[6])§	537	General	80–110	180–200	112	151	Death at 28 days	24.7	26.0	Not reported
NICE-SUGAR[7]	6104	General	81–108	144–180	118	145	Death at 90 days	27.5	24.9	1.14 (1.02–1.28)

The NICE-SUGAR study simply tells us that in cohorts of patients such as those studied, there is no additional benefit from the lowering of blood glucose levels below the range of approximately 140 to 180 mg per deciliter;

THE JOURNAL OF
CLINICAL ENDOCRINOLOGY
& METABOLISM

CLINICAL REVIEW

Intensive Insulin Therapy in Critically Ill Patients: NICE-SUGAR or Leuven Blood Glucose Target?

Greet Van den Berghe, et al 2010

Clinical Implications: Quo Vadis?

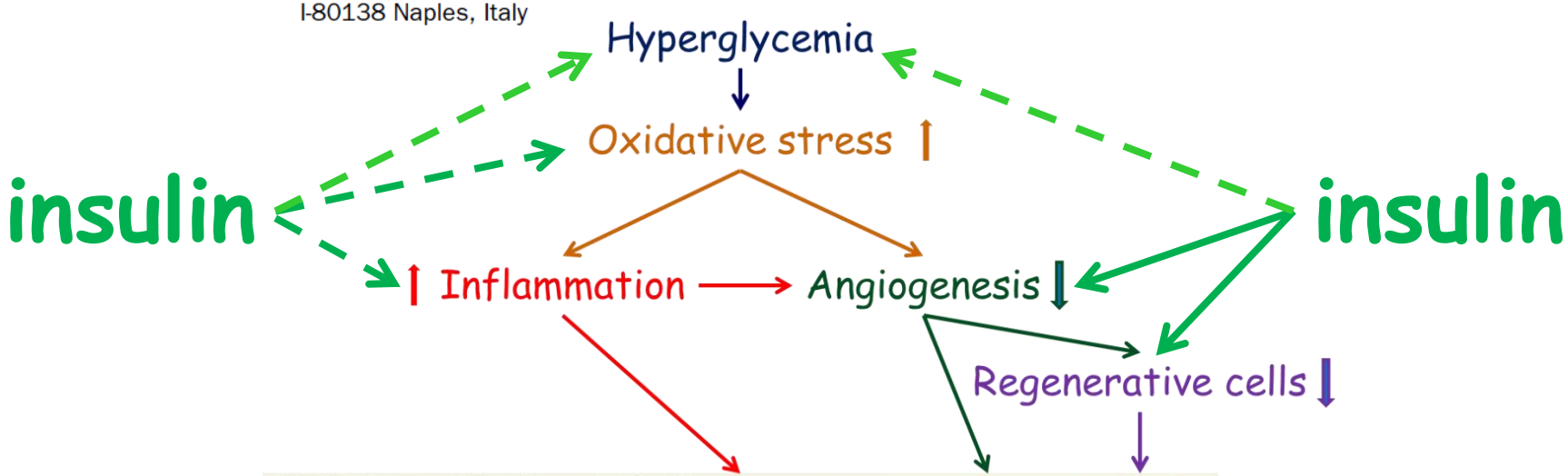
Pathophysiological effects of insulin infusion

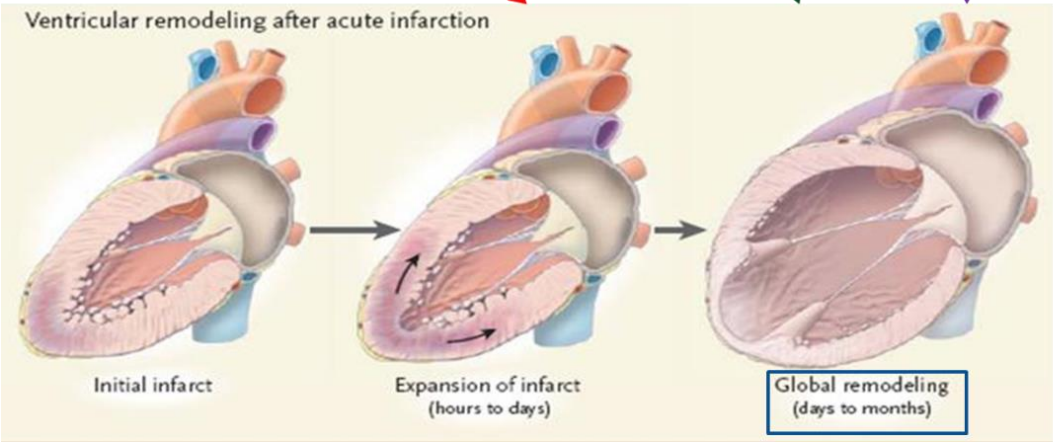
THE LANCET Vol 355 • May 6, 2000

Stress hyperglycaemia and death after myocardial infarction

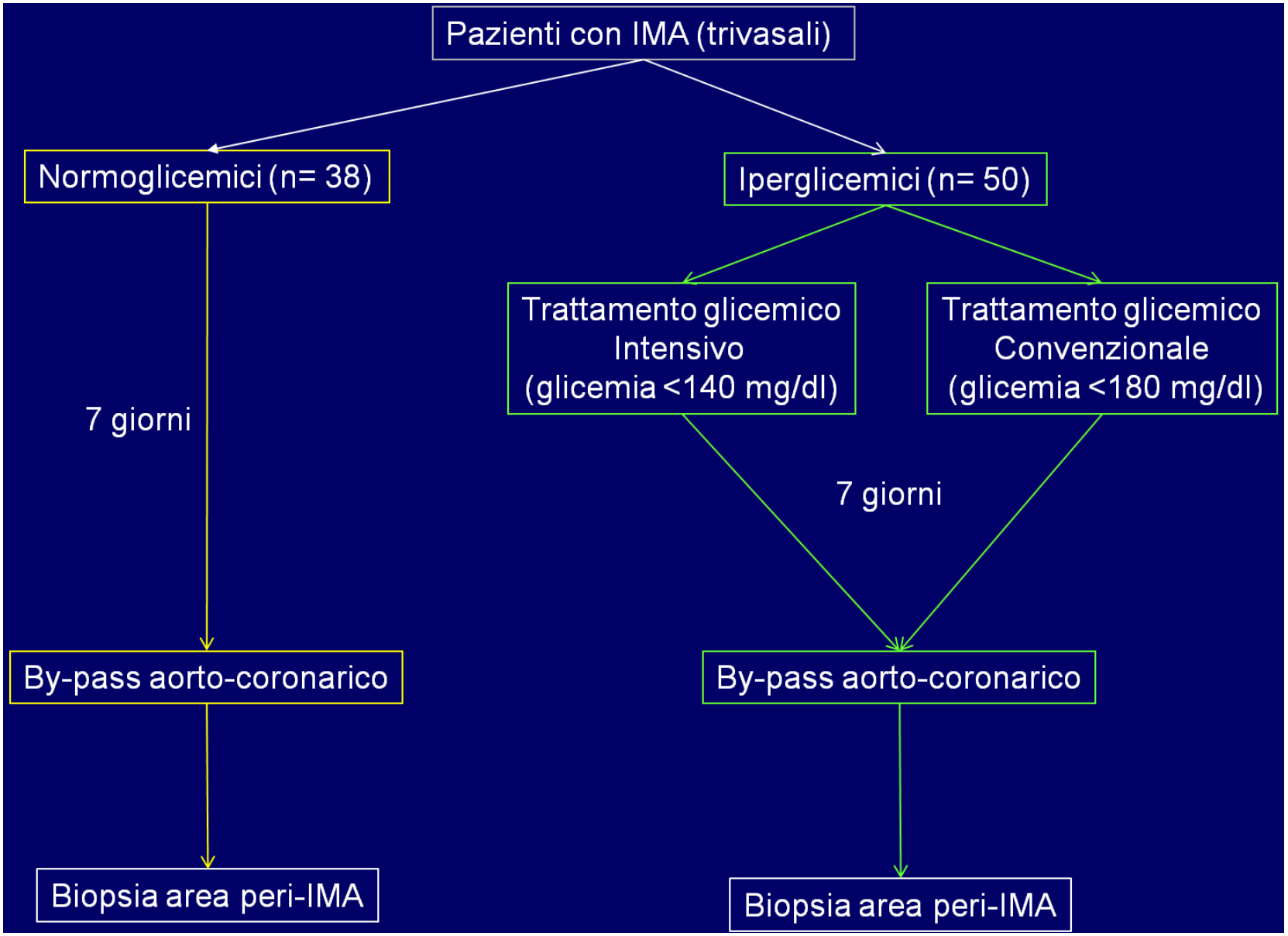
*Raffaele Marfella, *Dario Giugliano*

Department of Geriatrics and Metabolic Diseases, Second University of Naples, I-80138 Naples, Italy





PROTOCOLLO DELLO STUDIO

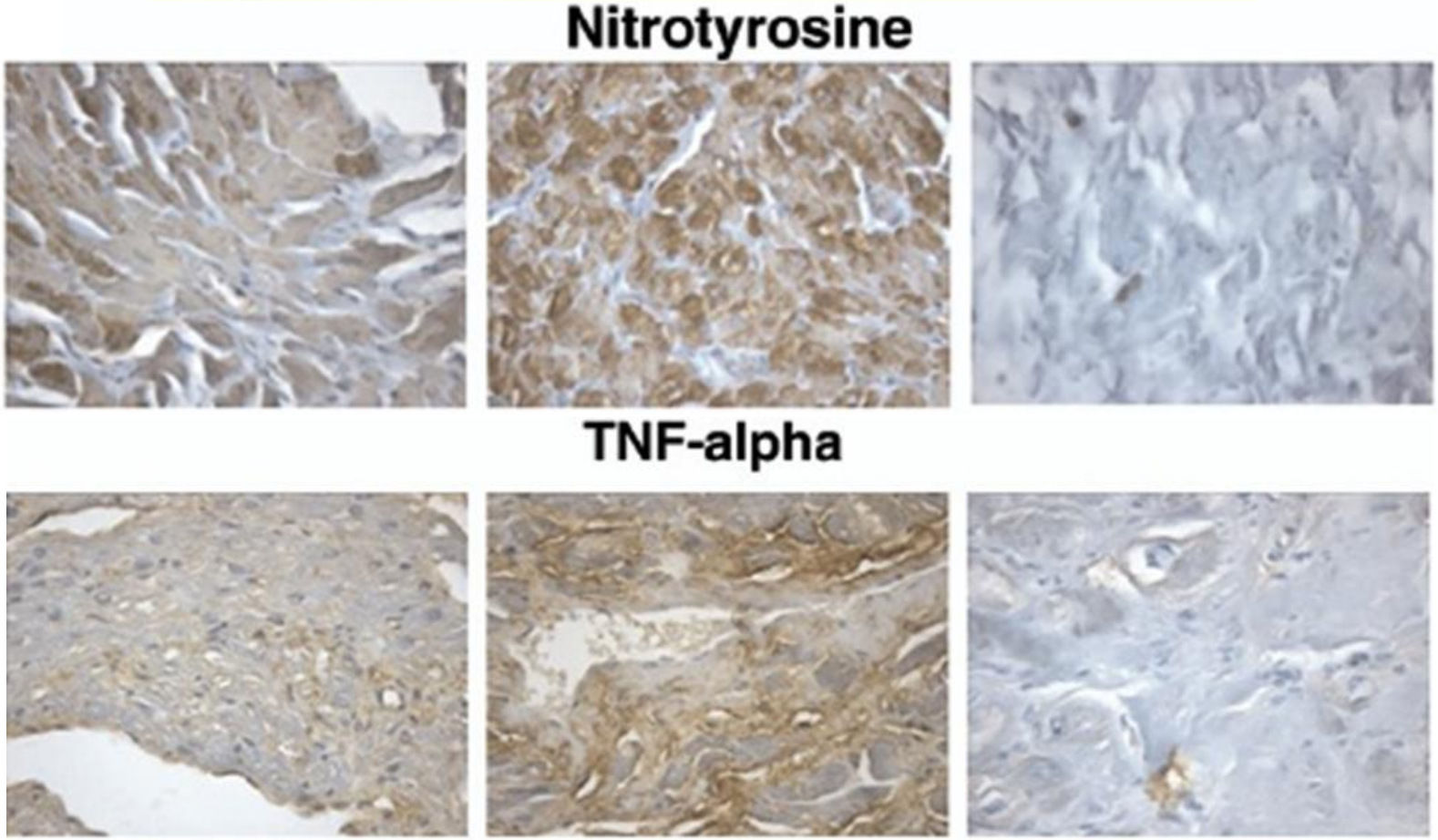


JACC
Journal of the American College of Cardiology

Tight Glycemic Control Reduces Heart Inflammation and Remodeling During Acute Myocardial Infarction in Hyperglycemic Patients

Vol. 53, No. 16, 2009

Raffaele Marfella, MD, PhD,* Clara Di Filippo, PhD,† Michele Portoghese, MD,§ Franca Ferraraccio, MD,‡ Maria Rosaria Rizzo, MD, PhD,* Mario Siniscalchi, MD, PhD,‖ Emilio Musacchio, MD,¶ Michele D'Amico, PhD,† Francesco Rossi, MD, PhD,† Giuseppe Paolisso, MD, PhD*



Intensive patient	Conventional patient	Control patient
Glucose levels:		
143 mg/dl	198 mg/dl	99 mg/dl

ENDOCRINE RESEARCH

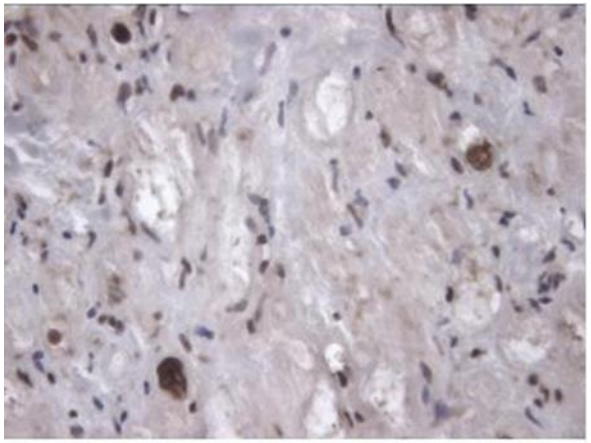
Tight Glycemic Control May Increase Regenerative Potential of Myocardium during Acute Infarction

expand article

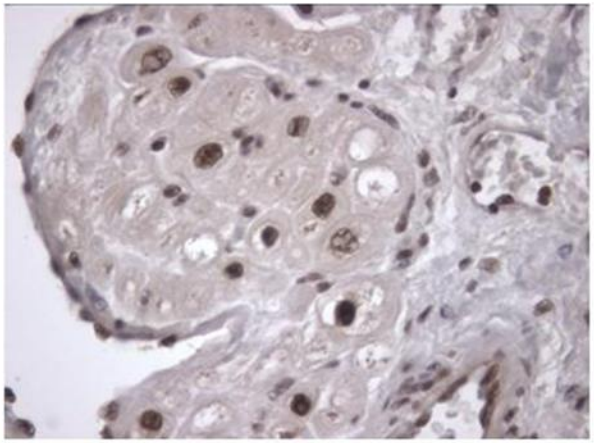
Raffaele Marfella*, Ferdinando Carlo Sasso*, Federico Cacciapuoti, Michele Portoghese, Maria Rosaria Rizzo, Mario Siniscalchi, Ornella Carbonara, Franca Ferraraccio, Michele Torella, Antonello Petrella, Maria Luisa Balestrieri, Paola Stiuso, Giannantonio Nappi and Giuseppe Paolisso

J Clin Endocrinol Metab, March 2012, 97(3):933–942

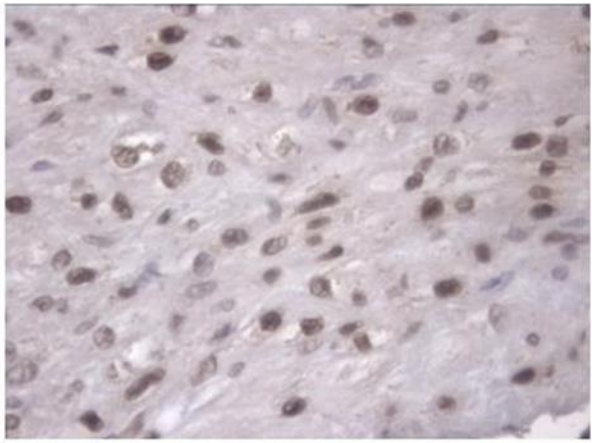
Ki-67



Conventional glycemic control



Intensive glycemic control



Normoglycemic patient

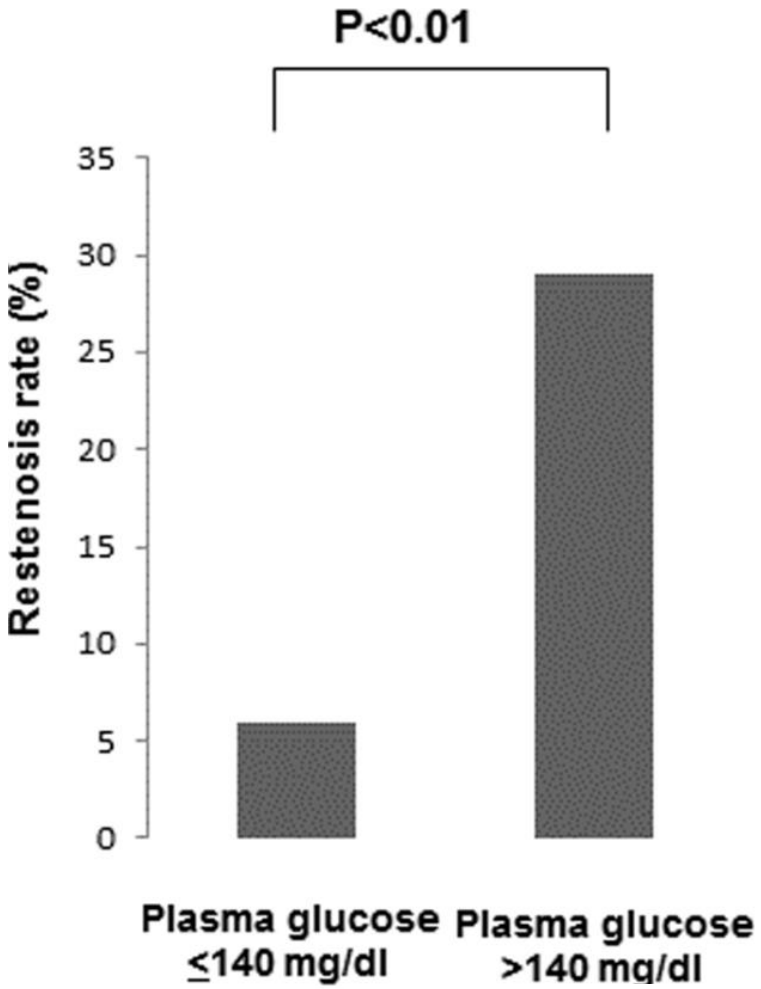
Glucose levels:

208 mg/dl **141 mg/dl** **102 mg/dl**

The Journal of Clinical Endocrinology & Metabolism

Peri-procedural tight glycemic control during early percutaneous coronary intervention is associated with a lower rate of in-stent restenosis, in patients with acute ST-elevation myocardial infarction

Raffaele Marfella, Ferdinando Carlo Sasso, Mario Siniscalchi, Pasquale Paolisso; Maria Rosaria Rizzo; Fausto Ferraro; Eugenio Stabile; Giovanni Sorropago; Paolo Calabrò; Ornella Carbonara; Giorgio Cinquegrana; Federico Piscione; Antonio Ruocco; Davide D'andrea; Antonio Rapacciuolo; Pasquale Petronella; Alessandro Bresciani; Paolo Rubino; Ciro Mauro.



J Clin Endocrinol Metab, August 2012, 97(8):2862–2871

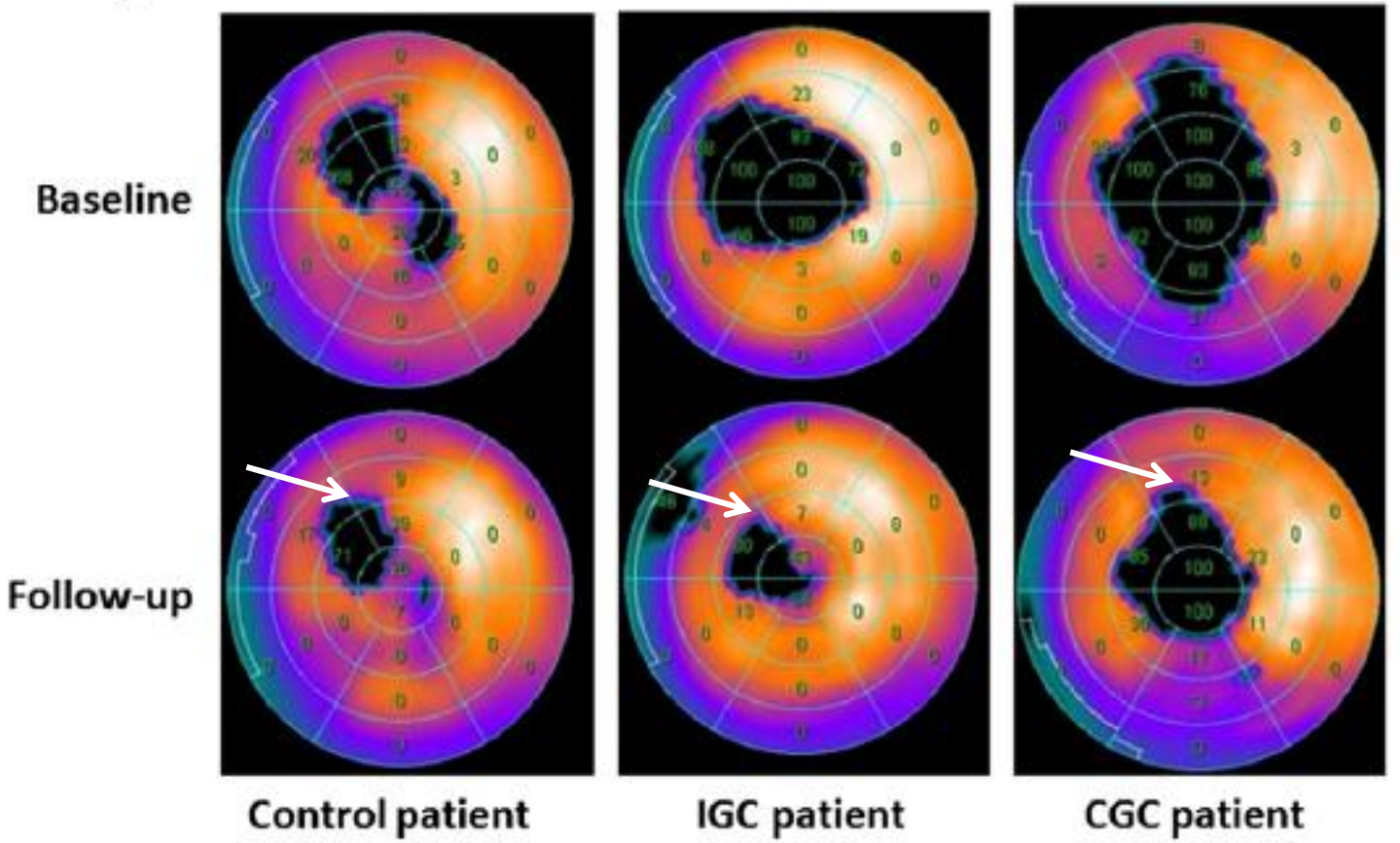
ELSEVIER

Peri-procedural tight glycemic control during early percutaneous coronary intervention up-regulates endothelial progenitor cell level and differentiation during acute ST-elevation myocardial infarction: Effects on myocardial salvage☆☆

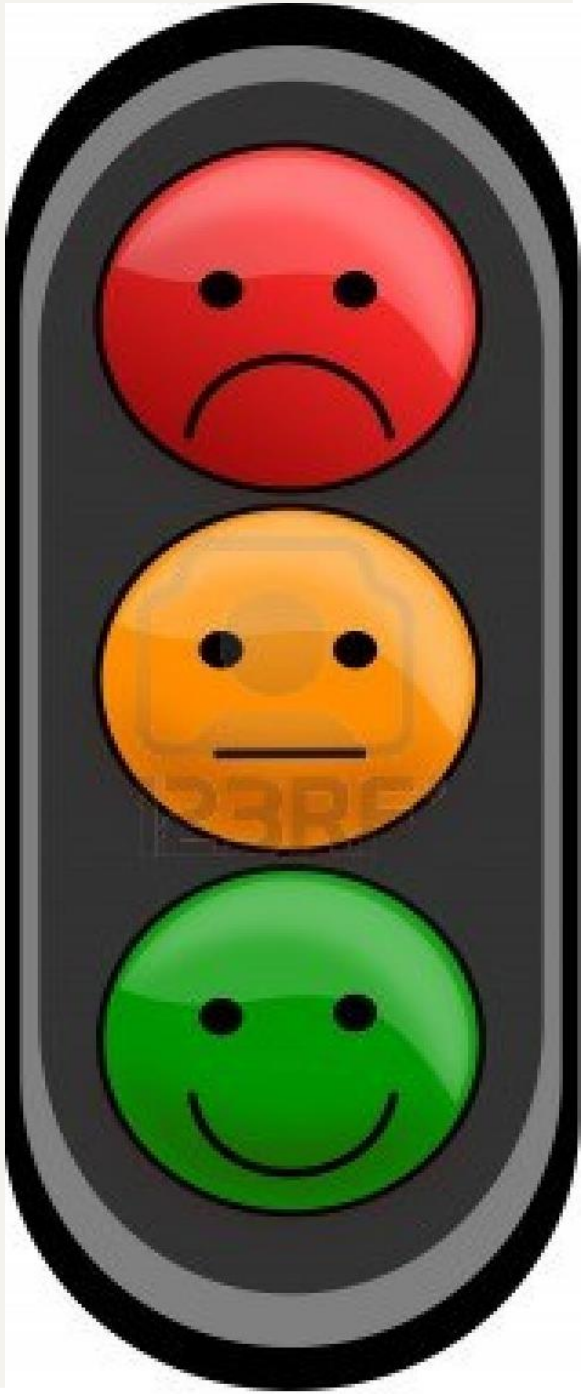
Raffaele Marfella [a,*], Maria Rosaria Rizzo [a], Mario Siniscalchi [b], Pasquale Paolisso [a], Michelangela Barbieri [a], Celestino Sardu [a], Antonella Savinelli [a], Nicola Angelico [c], Salvatore Del Gaudio [d], Nicolino Esposito [c], Pier Francesco Rambaldi [e], Nunzia D'Onofrio [e], Luigi Mansi [e], Ciro Mauro [b].

International Journal of Cardiology 168 (2013) 3954–3962

Myocardial salvage



Glucose levels: 106 mg/dl 139 mg/dl 216 mg/dl



RECOMMENDATIONS

Valori > 180 mg/dl
NON SONO PIU' ACCETTABILI

Target inferiori (110-140 mg/dl)
sono accettabili in pz selezionati

Target glicemico=
140-180 mg/dl

Circulation December 23/30, 2014

2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation

The Task Force for the management of acute myocardial infarction in patients presenting with ST-segment elevation of the European Society of Cardiology (ESC)

In the acute phase, it is reasonable to manage hyperglycaemia (i.e. maintain a blood glucose concentration ≤11.0 mmol/L or 200 mg/dL) but absolutely avoid hypoglycaemia.[282]

Management of hyperglycaemia

Recommendations	Class[a]	Level[b]
It is recommended to measure glycaemic status at initial evaluation in all patients, and perform frequent monitoring in patients with known diabetes or hyperglycaemia (defined as glucose levels ≥11.1 mmol/L or ≥ 200 mg/dL)	I	C
In patients on metformin and/or SGLT2 inhibitors, renal function should be carefully monitored for at least 3 days after coronary angiography/PCI.[c]	I	C
Glucose-lowering therapy should be considered in ACS patients with glucose levels >10 mmol/L (>180 mg/dL), while episodes of hypoglycaemia (defined as glucose levels ≤3.9 mmol/L or ≤ 70 mg/dL) should be avoided.	IIa	C
Less stringent glucose control should be considered in the acute phase in patients with more advanced cardiovascular disease, older age, longer diabetes duration, and more comorbidities.	IIa	C

ACS = acute coronary syndrome; PCI = percutaneous coronary intervention; SGLT2 = sodium-glucose co-transporter-2.
[a]Class of recommendation.
[b]Level of evidence.
[c]A short withdrawal of metformin may be considered after an invasive coronary procedure.

Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION
American Heart Association®
Learn and Live℠

Glucose-Lowering Targets for Patients With Cardiovascular Disease

Focus on Inpatient Management of Patients With Acute Coronary Syndromes

Mikhail Kosiborod, MD; Darren K. McGuire, MD, MHSc

Circulation 2010, 122:2736-2744

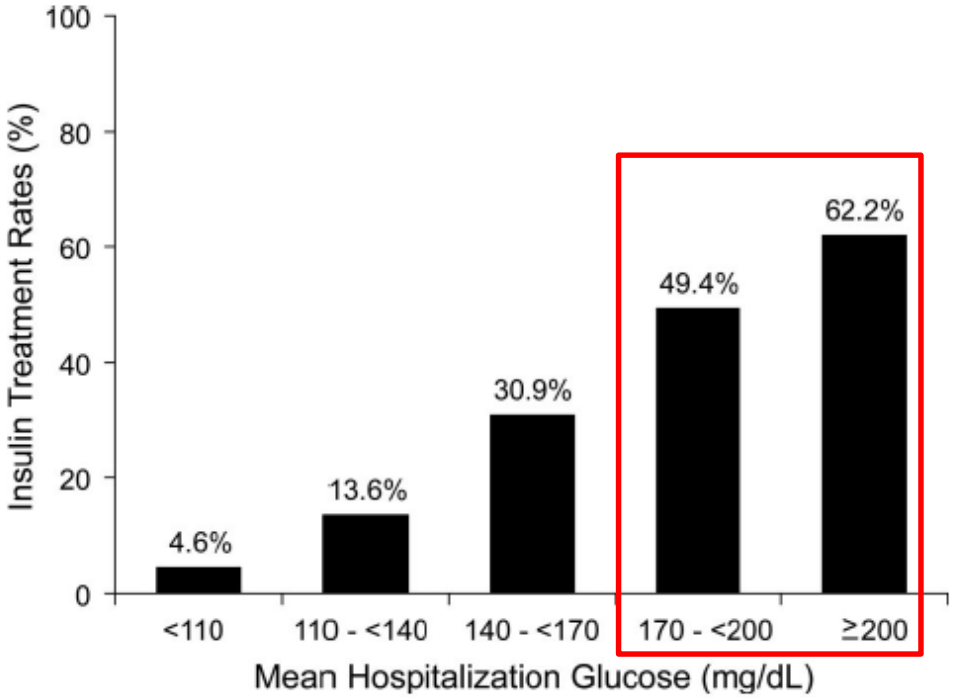


Figure 3. Rates of treatment with any insulin in patients hospitalized with ACS across mean hospitalization glucose levels. Adapted from Kosiborod et al.[21]

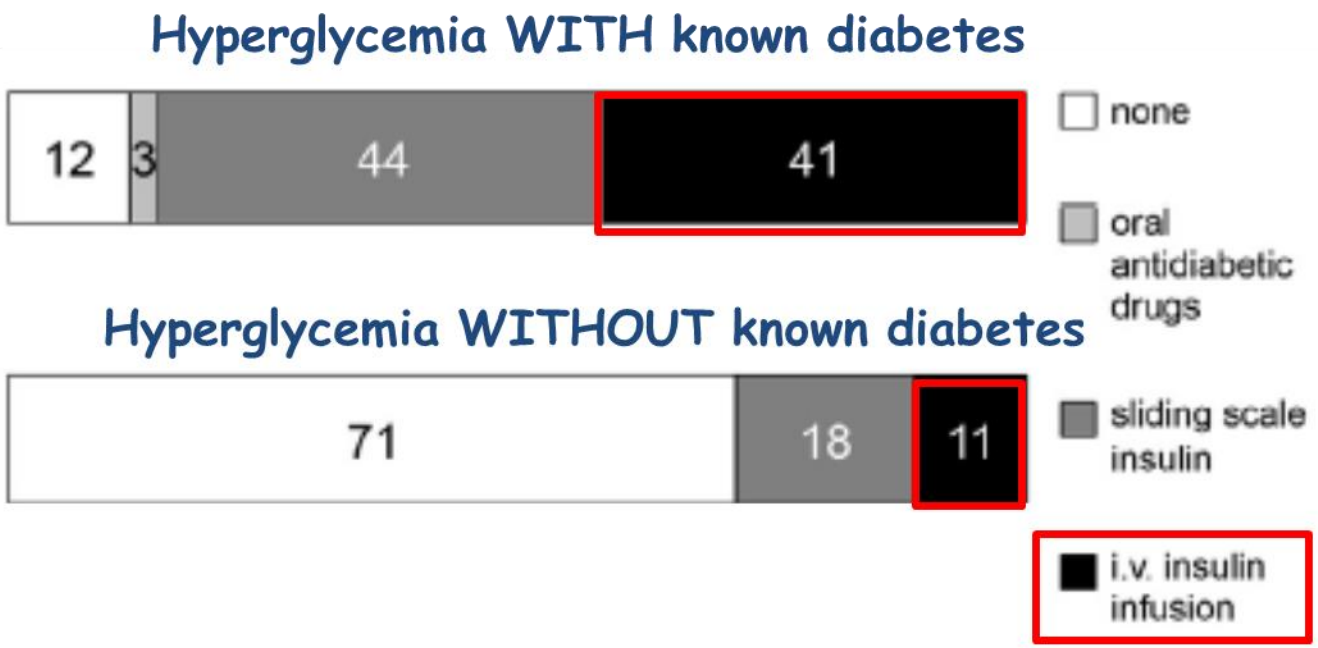
Available online at www.sciencedirect.com

Nutrition, Metabolism & Cardiovascular Diseases

journal homepage: www.elsevier.com/locate/nmcd

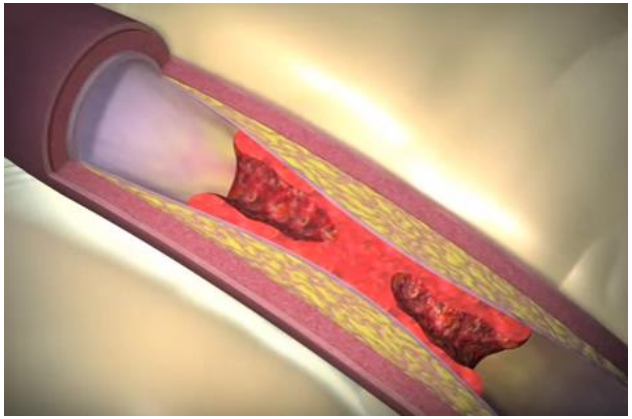
A multicenter observational study on the management of hyperglycemia in patients with acute coronary syndrome

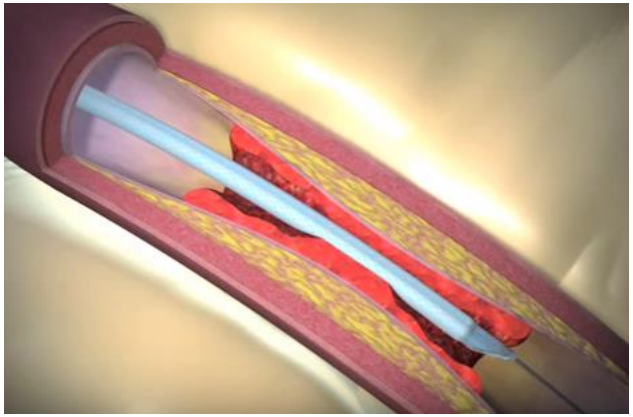
F. Avanzini [a,b,*], A. Mafrici [c], E. Riva [a], M.G. Franzosi [a], V. Milani [a], V. Giudici [d], G. Marelli [b], G. Mariani [c], P.M. Piatti [e], M.C. Roncaglioni [a] on behalf of GLICINE-SPIDER Collaborative Group[1]

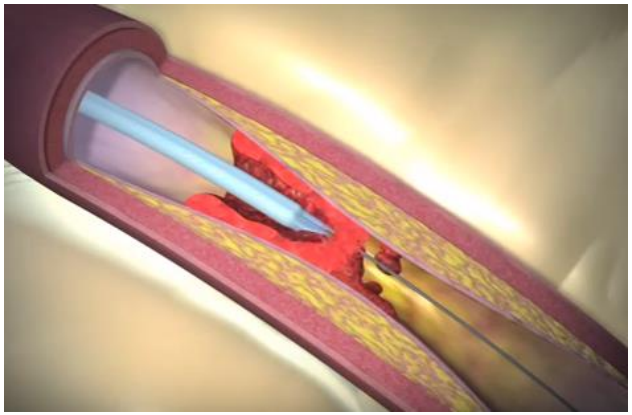


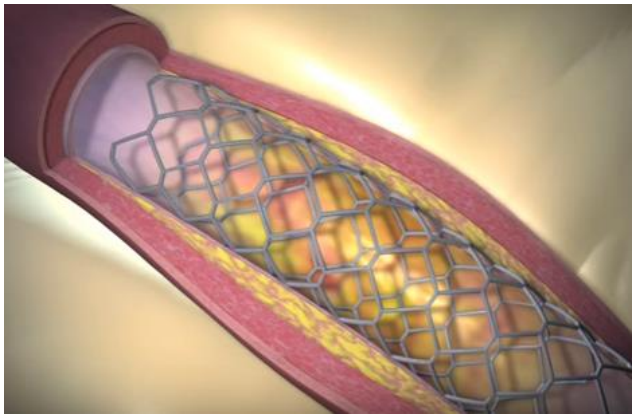
January 2018

TROMBOASPIRAZIONE







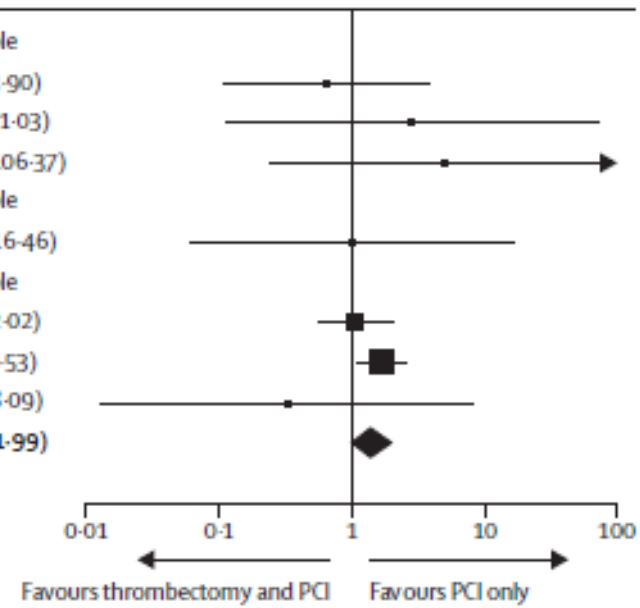


Outcomes after thrombus aspiration for ST elevation myocardial infarction: 1-year follow-up of the prospective randomised TOTAL trial

Sanjit S Jolly, John A Cairns, Salim Yusuf, Michael J Rokoss, Peggy Gao, Brandi Meeks, Sasko Kedev, Goran Stankovic, Raul Moreno, Anthony Gershlick, Saqib Chowdhary, Shahar Lavi, Kari Niemela, Ivo Bernat, Warren J Cantor, Asim N Cheema, Philippe Gabriel Steg, Robert C Welsh, Tej Sheth, Olivier F Bertrand, Alvaro Avezum, Ravinay Bhindi, Madhu K Natarajan, David Horak, Raymond C M Leung, Saleem Kassam, Sunil V Rao, Magdi El-Omar, Shamir R Mehta, James L Velianou, Samir Pancholy, Vladimír Džavík, for the TOTAL Investigators

	Thrombectomy and PCI		PCI only		Weight	M–H fixed odds ratio (95% CI)
	Events	Total	Events	Total		
Bulum et al (2012)[11]	0	30	0	30		Not estimable
INFUSE-AMI (2012)[17]	2	229	3	223	5·0%	0·65 (0·11–3·90)
ITTI (2012)[18]	1	52	0	48	0·9%	2·83 (0·11–71·03)
Kaltoft et al (2006)[19]	2	108	0	107	0·8%	5·05 (0·24–106·37)
MUSTELA (2012)[20]	0	50	0	104		Not estimable
REMEDIA (2005)[21]	1	48	1	48	1·6%	1·00 (0·06–16·46)
TAPAS (2008)[5,6]	0	529	0	531		Not estimable
TASTE (2014)[7,8]	19	3621	18	3623	29·8%	1·06 (0·55–2·02)
TOTAL	60	5035	36	5029	59·3%	1·67 (1·10–2·53)
TROFI (2013)[22]	0	71	1	70	2·5%	0·32 (0·01–8·09)
Total (95% CI)		**9773**		**9813**	**100·0%**	**1·43 (1·03–1·99)**
Total events	85		59			

Heterogeneity χ^2=3·85, df=6 (p=0·70); I^2=0%
Test for overall effect: Z=2·12 (p=0·03)



Lancet 2016; 387: 127–35

JACC
JOURNAL of the AMERICAN COLLEGE of CARDIOLOGY

Thrombus Aspiration in Patients With High Thrombus Burden in the TOTAL Trial

Sanjit S. Jolly, MD, MSc,[a] John A. Cairns, MD,[b] Shahar Lavi, MD,[c] Warren J. Cantor, MD,[d] Ivo Bernat, MD, PhD,[e] Asim N. Cheema, MD, PhD,[f] Raul Moreno, MD, PhD,[g] Sasko Kedev, MD, PhD,[h] Goran Stankovic, MD,[i] Sunil V. Rao, MD,[j] Brandi Meeks, MSc,[a] Saqib Chowdhary, MD, PhD,[k] Peggy Gao, MSc,[a] Matthew Sibbald, MD, PhD,[a] James L. Velianou, MD,[a] Shamir R. Mehta, MD, MSc,[a] Michael Tsang, MD, MSc,[a] Tej Sheth, MD,[a] Vladimír Džavík, MD,[l] from the TOTAL Investigators

TABLE 2 Thrombus Aspiration Versus PCI Alone for High and Low Thrombus Subgroups

	Thrombus Aspiration*	PCI Alone*	HR (95% CI)	p Value	Interaction p Value
Primary outcome at 30 days					
High thrombus burden	263 (5.8)	272 (6.1)	0.95 (0.80-1.12)	0.54	
Low thrombus burden	22 (4.4)	18 (3.2)	1.39 (0.75-2.60)	0.30	0.24
Stroke at 30 days					
High thrombus burden	31 (0.7)	16 (0.4)	1.90 (1.04-3.48)	0.03	
Low thrombus burden	2 (0.4)	0 (0.0)	Not estimable	0.13	0.99
All-cause death at 30 days					
High thrombus burden	111 (2.5)	136 (3.1)	0.80 (0.62-1.03)	0.08	
Low thrombus burden	8 (1.6)	7 (1.2)	1.29 (0.47-3.57)	0.62	0.37
CV death at 30 days					
High thrombus burden	107 (2.4)	134 (3.0)	0.78 (0.61-1.01)	0.06	
Low thrombus burden	8 (1.6)	6 (1.1)	1.51 (0.52-4.36)	0.44	0.24
MI at 30 days					
High thrombus burden	69 (1.5)	58 (1.3)	1.17 (0.82-1.66)	0.39	
Low thrombus burden	5 (1.0)	8 (1.4)	0.71 (0.23-2.16)	0.54	0.40
Class IV heart failure at 30 days					
High thrombus burden	78 (1.7)	71 (1.6)	1.08 (0.78-1.49)	0.65	
Low thrombus burden	7 (1.4)	4 (0.7)	1.99 (0.58-6.81)	0.26	0.34
Cardiogenic shock at 30 days					
High thrombus burden	84 (1.9)	94 (2.1)	0.88 (0.65-1.18)	0.38	
Low thrombus burden	6 (1.2)	4 (0.7)	1.70 (0.48-6.04)	0.41	0.32

PUBLISHED BY ELSEVIER

JACC
JOURNAL of the AMERICAN COLLEGE of CARDIOLOGY

To Aspirate or Not to Aspirate

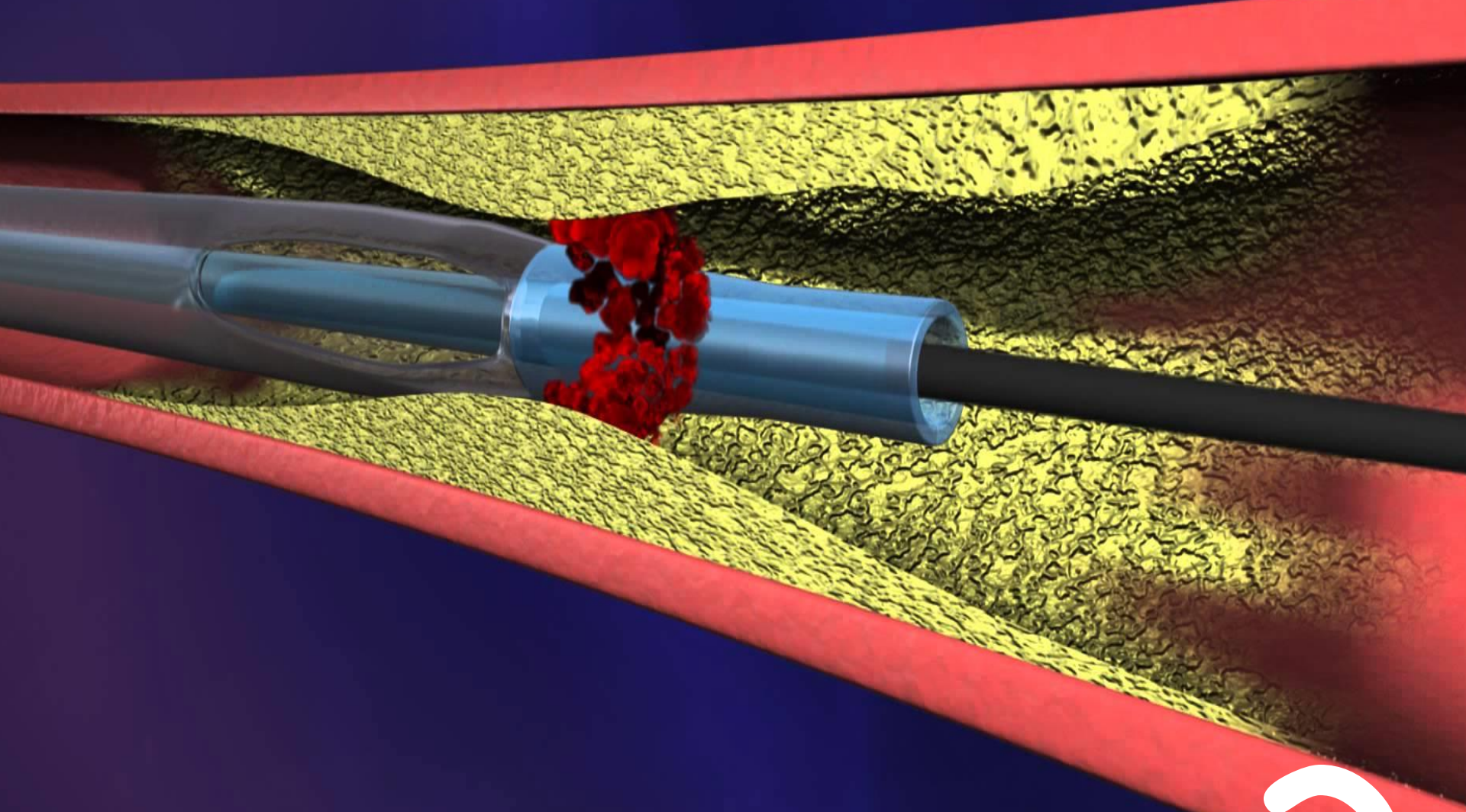
That Is the Question*

Hans-Henrik Tilsted, MD, Goran K. Olivecrona, MD, PhD

There is no benefit of using thrombus aspiration in selected high-risk patients?

JACC: CARDIOVASCULAR INTERVENTIONS
VOL. 8, NO. 4, 2015

ISSN 1936-8798/$36.00
PUBLISHED BY ELSEVIER INC.
http://dx.doi.org/10.1016/j.jcin.2015.01.014



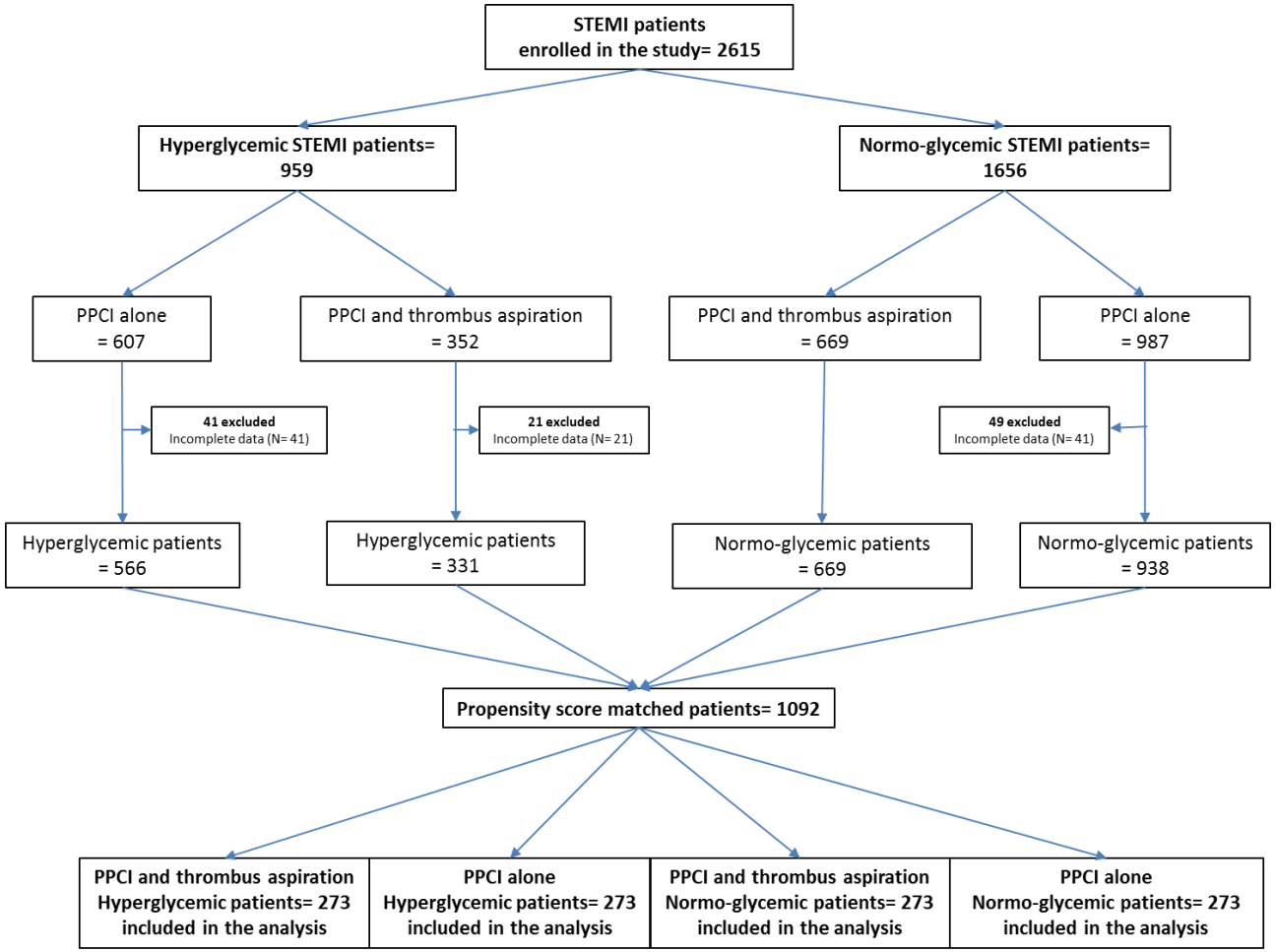
PAZIENTI IPERGLICEMICI con STEMI ?

Thrombus Aspiration in Hyperglycemic ST-elevation myocardial InfarcTIon (STEMI) patients: 1-year follow-up of the TAHITI study

*Raffaele Marfella[1], MD, PhD; *Maria Luisa Balestrieri[2], PhD; Nunzia D'Onofrio[2], PhD; Mario Siniscalchi[3], MD, PhD; Pasquale Paolisso[1], MD; Celestino Sardu[1], MD, PhD; Paolo Calabrò[4], MD; Felice Gragnano[4], MD; Fabio Minicucci[3], MD; Giuseppe Signoriello[5], MD; Pasquale Mone[1], MD; Franca Ferraraccio[5], MD; Lucia Scisciola[2], PhD; Alessandro Bellis[3], MD; Michele Portoghese[6], MD; Ciro Mauro[3], MD; Maria Rosaria Rizzo[1], MD, PhD; Giuseppe Paolisso[1], MD; Michelangela Barbieri[1], MD, PhD

CARDIO VASCULAR DIABETOLOGY

In Press



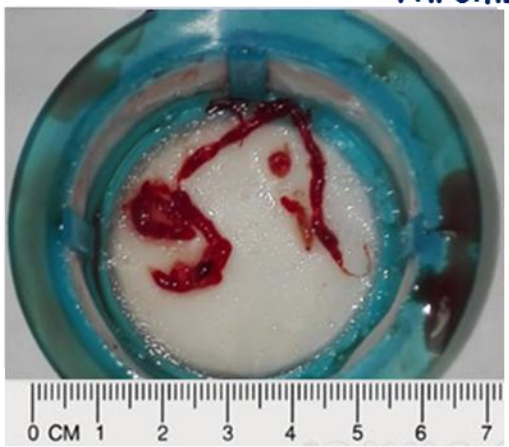
Thrombus Aspiration in Hyperglycemic ST-elevation myocardial InfarcTIon (STEMI) patients: 1-year follow-up of the TAHITI study

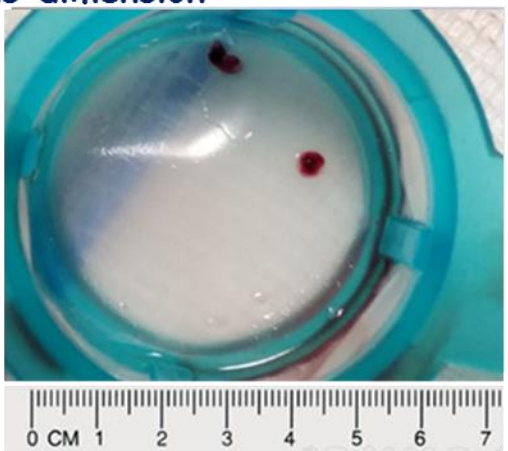
*Raffaele Marfella[1], MD, PhD; *Maria Luisa Balestrieri[2], PhD; Nunzia D'Onofrio[2], PhD; Mario Siniscalchi[3], MD, PhD; Pasquale Paolisso[1], MD; Celestino Sardu[1], MD, PhD; Paolo Calabrò[4], MD; Felice Gragnano[4], MD; Fabio Minicucci[3], MD; Giuseppe Signoriello[5], MD; Pasquale Mone[1], MD; Franca Ferraraccio[5], MD; Lucia Scisciola[2], PhD; Alessandro Bellis[3], MD; Michele Portoghese[6], MD; Ciro Mauro[3], MD; Maria Rosaria Rizzo[1], MD, PhD; Giuseppe Paolisso[1], MD; Michelangela Barbieri[1], MD, PhD

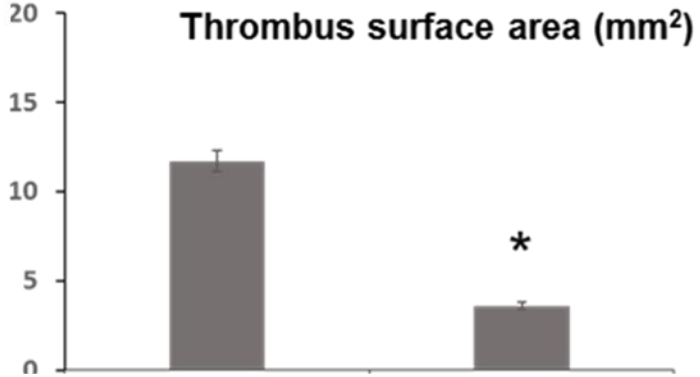
CARDIO VASCULAR DIABETOLOGY

In Press

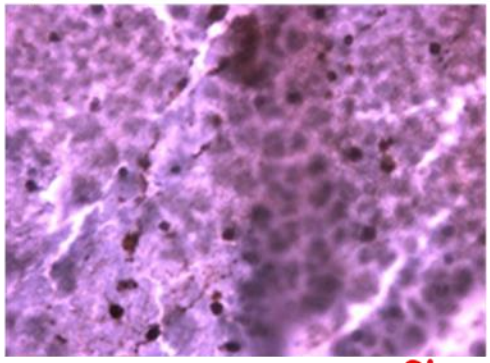
Thrombus dimension

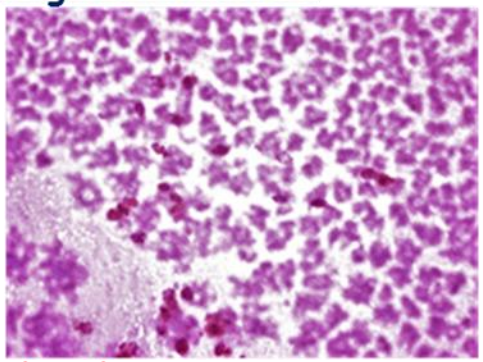


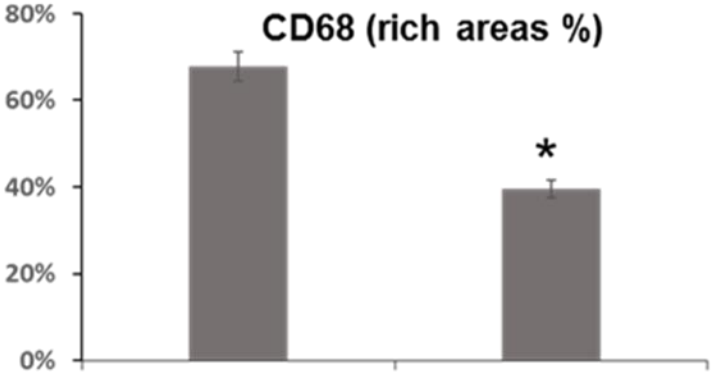




Macrophages







Glucose levels

198 mg/dl

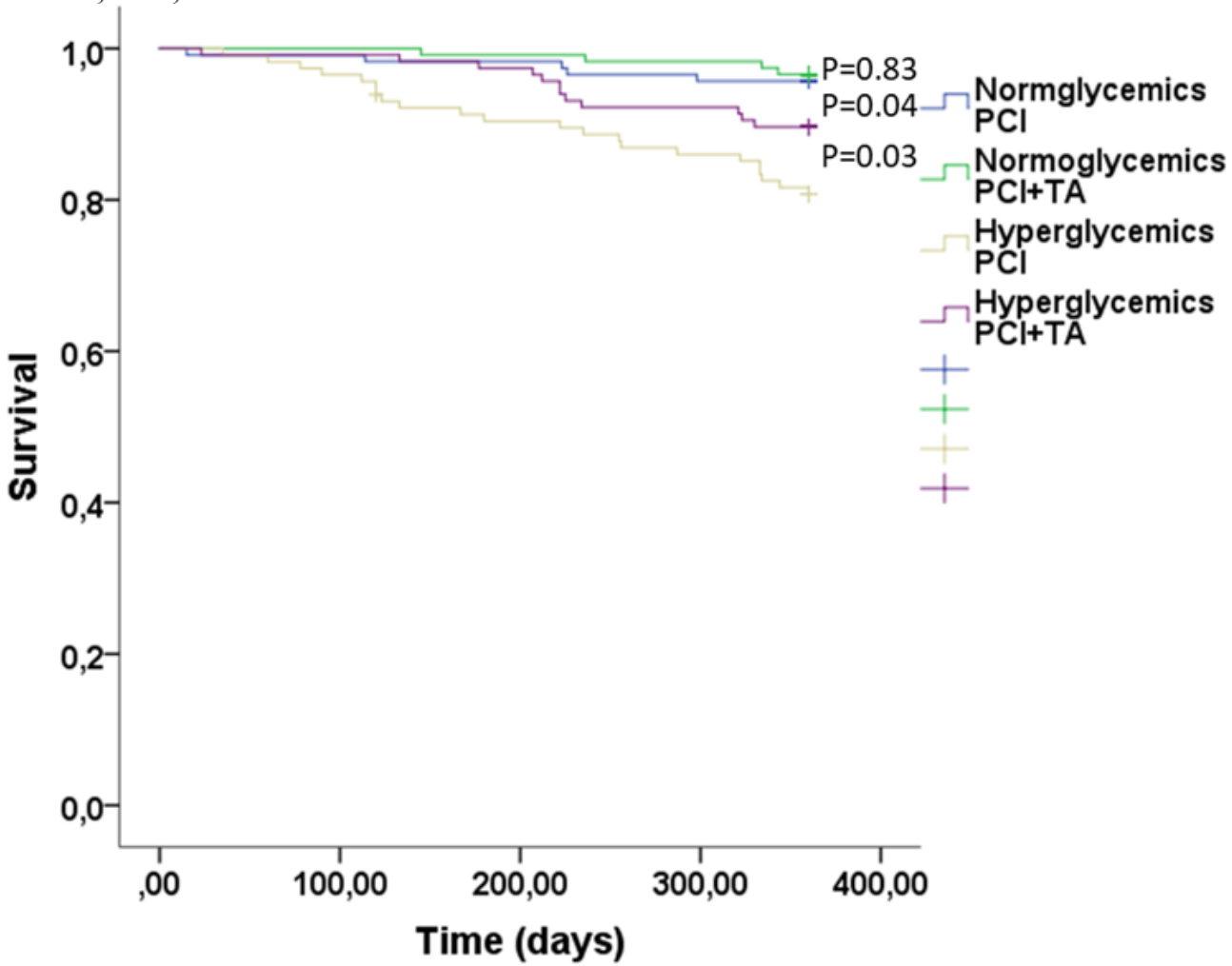
109 mg/dl

JACC
Journal of the American College of Cardiology

In Press

Thrombus Aspiration in hyperglycemic patients with high inflammation levels in coronary thrombus

Celestino Sardu,MD, PhD; Nunzia D'Onofrio, PhD; Ciro Mauro, MD; Marialuisa Balestrieri,PhD; Raffaele Marfella, MD, PhD



JACC
JOURNAL of the AMERICAN COLLEGE of CARDIOLOGY

In Press

Thrombus Aspiration in hyperglycemic patients with high inflammation levels in coronary thrombus

Celestino Sardu,MD, PhD; Nunzia D'Onofrio, PhD; Ciro Mauro, MD; Marialuisa Balestrieri,PhD; Raffaele Marfella, MD, PhD

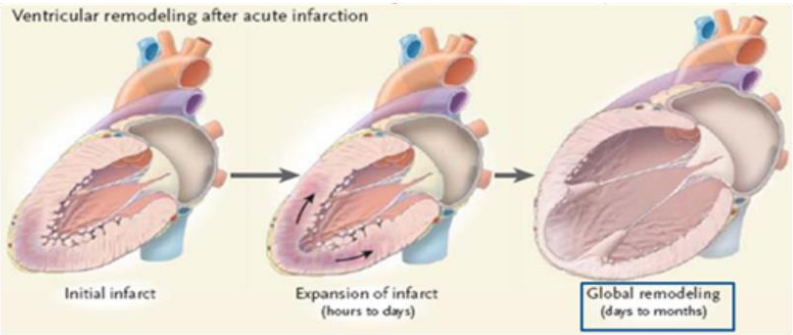
STEMI Iperglicemia

Stress ossidativo

Infiammazione

Trombosi

Tromboaspirazione



Hindawi
Journal of Diabetes Research
Volume 2018, Article ID 3106056, 8 pages
https://doi.org/10.1155/2018/3106056

Review Article

Role of Tight Glycemic Control during Acute Coronary Syndrome on CV Outcome in Type 2 Diabetes

Ferdinando Carlo Sasso,[1] Luca Rinaldi,[1] Nadia Lascar,[2] Aldo Marrone,[1] Pia Clara Pafundi,[1] Luigi Elio Adinolfi,[1] and Raffaele Marfella[1]

Tips

- Indifference to reduce hyperglycemia increases mortality
- More emphasis to reduce hyperglycemia increases mortality
- Tight glucose control reduces mortality
- Thrombus aspiration might help to reduce hyperglycemic related mortality