BETA BLOCKERS FOR ALL PATIENTS AFTER ST-ELEVATION MYOCARDIAL INFARCTION

PROPONENT'S VIEW

Bojan Cercek MD, PhD Heart Institute, Cedars-Sinai Medical Center Los Angeles, California, USA

2013 ACCF/AHA Guideline for the Management of ST-Elevation Myocardial Infarction: Executive Summary : A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines

7. Routine Medical Therapies: Recommendations

7.1. Beta Blockers

Class I

- 1. Oral beta blockers should be initiated in the first 24 hours in patients with STEMI who do not have any of the following: signs of HF, evidence of a low-output state, increased risk for cardiogenic shock, or other contraindications to use of oral beta blockers (PR interval more than 0.24 seconds, second- or third-degree heart block, active asthma, or reactive airways disease).¹⁶⁹⁻¹⁷¹ (Level of Evidence: B)
- 2. Beta blockers should be continued during and after hospitalization for all patients with STEMI and with no contraindications to their use.^{172,173} (Level of Evidence: B)
- 3. Patients with initial contraindications to the use of beta blockers in the first 24 hours after STEMI should be reevaluated to determine their subsequent eligibility. (Level of Evidence: C)

Class IIa

1. It is reasonable to administer intravenous beta blockers at the time of presentation to patients with STEMI and no contraindications to their use who are hypertensive or have ongoing ischemia.^{169–171} (Level of Evidence: B)

THE JOINT COMMISSION : AMI MEASURE SET

Set Measure	
ID #	Measure Short Name
AMI-1	Aspirin at Arrival
AMI-2	Aspirin Prescribed at Discharge
AMI-3	ACEI or ARB for LVSD
AMI-4	Adult Smoking Cessation Advice/Counseling*
AMI-5	Beta-Blocker Prescribed at Discharge
Alvii-7	weatan nime to Fibrinolysis
AMI-7a	Fibrinolytic Therapy Received Within 30 Minutes of Hospital Arrival
AMI-8	Median Time to Primary PCI
AMI-8a	Primary PCI Received Within 90 Minutes of Hospital Arrival
AMI-9	Inpatient Mortality (retired effective 12/31/2010)
AMI-10	Statin Prescribed at Discharge [@]

Beta Blockade After Myocardial Infarction : All Cause Mortality and Reinfarction

Short Term Trials	Trial Van de Werf 1003w43	<	Trial Boissel 1990 ^{w51}		
	Yusuf 1980 ^{w48}		Acebutolol pooled	\Rightarrow	Long Term
	ISIS-1 Collaborative Group 1986 ^{w17}		Revnolds 1972 ^{w72}		
	Atenolol pooled	4	Ahlmark 1974 ^{w49}		
	Heber 1987 ^{w14}		Wilhelmsson 1974 ^{w79}		
	Labetalol pooled	\triangleleft	Andersen 1979 ^{w50}		
	Von Essen 1982 ^{w44}			4	
	TIMI IIB Study Group 1989 ^{w40}		WIICOX 1980a ^{w76} Vusuf 1070w80		
	MIAMI Trial Research Group 1985 ^{w25}		Atenolol pooled		
	Metoprolol pooled	♦	Basu 1997 ^{w56}		
	CPRG 1981 ^{w6}		Carvedilol pooled		
	Fuccella 1968 ^{w11}		Rehnavist 1980 ^{w70}		
	Wilcox 1980b ^{w46}		López 1993 ^{w75}		
	Lombardo 1979 ^{w22}		Manger Cats 1983 ^{w65}		
		$\qquad \qquad $	Rehnqvist 1984 ^{w/1}		
	Owensby 1984 ^{w31}		LIT Research Group 1087W64		
	Pindolol pooled		Hjalmarson 1981 ^{w61}		
	Evemy 1978 ^{wg}		Metoprolol pooled	Φ	
	Jonansson 1980 ^{w10}		European infarction study 1984 ^{w58}		
	Snow 1980w38		Schwartz 1992 ^{w74} (high risk)		
	Practolol pooled		Schwartz 1992 ^{W/4} (low risk)	<u>I</u> II	
	Mueller 1980w26	· · · · · · · · · · · · · · · · · · ·	Oxprenolol pooled		
	Peter 1978 ^{w32}		Australian and Swedish study 1983w53		
	Ledwich 1968 ^{w20}		Pindolol pooled	\downarrow	
	Gupta 1982 ^{w12}		Barber 1967 ^{w55}		
	Sloman 1967 ^{w37}		Multicentre international study 1975 ^{w67}		
	Lotremont 1968 ^{we} Kabler 1068w19		Practolol pooled	Φ	
	Barber 1976 ^{w3}		Kaul 1988 ^{w63}		
	Bath 1966 ^{w27}		Mazur 1984 ^{w66}		
	Balcon 1966 ^{w2}		Wilcox 1980a ^{w76} Baber 1080w54		
	Norris 1984 ^{w30}		Aronow 1997 ^{w52}		
	Clausen 1966 ^{w5}		Hansteen 1982 ^{w60}	۲	
	Norris 1984 ^{w33}		BHAT Trial Research Group 1982 ^{w57}		
	Pronranolol nooled		Propranolol pooled	Φ	
	Topkin 1091W41		Julian 1982 ^{w62}	EI	
	Campbell 1984 ^{w4}				
	Ranganathan 1988 ^{w34}		Roqué 1987 ^{w//}		
	ICSG 1984 ^{w16}		Timolol nooled		
	UKCSG 1983 ^{w42}		Daraez 1005W69	×	
	Timolol pooled		Xamoterol pooled		
	Fixed effects pooled		Fixed effects pooled	4	
	Full random effects pooled	♦ 4%	Full random effects pooled	∲ 23%	
	Helerogeneity Q=21.0, df=50, P=1.0		Heterogeneity Q=39.7, df=32, P=0.16		BMJ. 1
	C	0.01 0.1 0.2 0.5 1 2 5 10 100	0.0	01 0.1 0.2 0.5 1 2 5 10 100	

Trials

.999.

COMMIT Trial: Intravenous then Oral Metoprolol in Patients with AMI





Lancet 2005.

Meta Analysis of Effects of Beta Blockers in Acute Myocardial Infarction

Category and trial	Events/patie	nts (%)		Proportional
	β <mark>block</mark> er	Control	Odds ratio (CI)	reduction
Death (any cause)				
26 small trials ¹⁵	117/2901 (4·0%)	126/2830 (4.5%)		
MIAMI ⁷	123/2877 (4·3%)	142/2901 (4·9%)	#	
ISIS-1 ¹⁵	317/8037 (3·9%)	367/7990 (4·6%)	- # -+	
COMMIT (low-risk only)	708/12 374 (5.7%)	801/12 555 (6·4%)	-₩-	12% (SE 4)
Total	1265/26 189 (4·8%)	1436/26 276 (5·5%)	\Diamond	(p=0.0006)
Reinfarction				
21 small trials ¹⁵	75/2341 (3.2%)	99/2331 (4·2%)	_	
MIAMI ⁷	85/2877 (3.0%)	111/2901 (3.8%)	_	
ISIS-1 ¹⁵	148/5807 (2.5%)	161/5834 (2.8%)		
COMMIT (low-risk only)	236/12374 (1·9%)	295/12 555 (2.3%)		220/ (55 6)
Total	544/23 399 (2·3%)	666/23621 (2.8%)	\Leftrightarrow	(p=0.0002)
Ventricular fibrillation or other cardiac arres	t			
25 small trials ¹⁵	69/2862 (2·4%)	105/2815 (3.7%)	_	
MIAMI ⁷	48/2877 (1.7%)	52/2901 (1.8%)		
ISIS-1 ¹⁵	189/8037 (2·4%)	198/7990 (2·5%)		
COMMIT (low-risk only)	513/12 374 (4.1%)	586/12 555 (4.7%)	-##+	1F0/ (SE F)
Total	819/26150 (3.1%)	941/26261 (3.6%)	\diamond	(p=0.002)

β blocker

better

Lancet 2005.

Control

better

CAPRICORN Trial: Effect of Carvedilol on Outcome After Myocardial Infarction in Patients with Left-Ventricular Dysfunction (LVEF < 40%)





Kaplan-Meier estimates of all-cause mortality or nonfatal myocardial infarction

Lancet. 2001.

PAMI Trials: Beta Blockers After Successful Angioplasty (N=2441, 6 Months Follow-up)



JACC. 2004.

PAMI Trials: Beta Blockers After Successful Angioplasty (N=2441, 6 Months Follow-up)



JACC. 2004.

REACH Registry: Beta Blocker Use and Clinical Outcomes In Stable Outpatients with Prior Myocardial Infarction (Cardiovascular Death, Nonfatal MI and Nonfatal Stroke)









Primary Outcome Secondary Outcome Death Cardiovascular Death Nonfatal MI Nonfatal Stroke Hospitalization HR 0.90 (0.79-1.03) HR 0.91 (0.82-1.00) HR 0.93 (0.80-1.08) HR 0.91 (0.76-1.09) HR 1.10 (0.87-1.41) HR 0.87 (0.66-1.13) HR 0.94 (0.84-1.05)

Cohort with Recent MI (<1 year) :

Primary Outcomes Secondary Outcomes Hospitalizations Cohort with Heart Failure: Primary Outcome HR 0.79 (0.60-1.04) OR 0.77 (0.64-0.92) OR 0.77 (0.62-0.95)

HR 0.89 (0.79-1.01)

OACIS Study: Impact of Beta Blockade on Long-Term Mortality After STEMI



Am J Cardiol. 2013.

OACIS Study: Impact of Beta Blockade on Long-Term Mortality After STEMI



Am J Cardiol. 2013.

OACIS Study: Impact of Beta Blockade on Long-Term Mortality After STEMI



Am J Cardiol. 2013.

Cardiovascular Outcomes After PCI for STEMI With Preserved LVEF Adjusted, N= 2494 from CREDO Kyoto Registry



Beta-Blocker Use Following Myocardial Infarction Low Prevalence of Evidence Based Dosing



Am Heart J. 2010.

THE ROUTINE USE OF BETA BLOCKERS IN STEMI PATIENTS

Data in primary PCI era of STEMi treatment suggest:

- 1. High risk patients (low EF, MVD, high risk index, use of diuretics) benefit from use of beta blockers (data from randomized study, registries)
- Low risk patients: ? benefit, no harm (data from registries), but benefit early after MI (1 year) (data from 1 registry) Difficulty : assessment of LVEF vs congestion vs acuity index vs MVD?

In conclusion: we should use beta blockers routinely in patients with STEMI without contraindications. Randomized trial would be helpful, but unlikely.

A performance measure ? No



Thank you !

Cardiovascular Outcomes After PCI for All STEMI Patients Adjusted, N= 3692 from CREDO Kyoto Registry



Cardiovasc Interv and Ther 2013