

당뇨병성 혈관 합병증은 치료할 수 있는가?

Management of the Patients with Diabetes Mellitus and Macro - and Microvascular Complications

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Abstract

The chronic, mainly vascular complications of diabetes mellitus involve many organs and are responsible for the majority of morbidity and mortality associated with the disease. The vascular complications of diabetes are divided into microvascular and macrovascular complications. Although some macrovascular complications may precede the development of diabetes, they frequently co - associate and present together. The increasing prevalence of diabetes and its association with macrovascular disease have become serious public health concerns. Patients with diabetes who have underlying coronary artery diseases have a different, more complex pathophysiology and a worse prognosis. Optimal management of these patients requires a comprehensive multifactorial approach to prevent microvascular and macrovascular events. In the setting of an acute myocardial infarction (aMI), immediate management should focus on limiting the infarct size using fibrinolytic agents, primary percutaneous intervention, or glycoprotein IIb/IIIa inhibitors. Drug - eluting stents may have an important role in patients with diabetes, who have a higher rate of post - intervention coronary restenosis than in nondiabetic individuals. All patients with aMI should be given aspirin, nitrates, beta - blockers, and angiotensin - converting enzyme inhibitors. Lipid - lowering agents as well as glycemic control have been shown to be effective in decreasing long - term mortality. Despite advances in the management of the vascular complications, the mortality rates of patients with diabetes remain 1.5 - to 2 - fold greater than those of individuals without diabetes. Maximizing the use of lifesaving therapies proved effective, and a tight metabolic control can further decrease mortality rates. However, many of these lifesaving therapies are underused in patients with diabetes because of the misconception that potential adverse effects may outweigh their benefits. New programs aimed at improving post - infarction quality of care in patients with diabetes, based on guidelines and expert recommendations, have shown promising. However, more efforts should be devoted to the improvement of outcomes related to these public health problems.

Keywords : Diabetes mellitus; Vascular complication; Coronary artery disease; Management

: ; ; ; ;

40% 가 (15). inhibitor 1(PAI - 1), prostacyclin
, (6).
, (advanced glycation end - products, AGEs)
가 가
(16, 17).
chemotactic factor
가 .
low - density lipoproteins(LDLs)
foam cell (6).
AGE
가 2~4 2 1
(2). (19). AGE
가
가,
가가
(20).
가
2.
가
(21).
1. 가 가
,
, It. main
,
(18). collateral
, nitric oxide
, endothelin angiotensin II
가 , 3. Remodeling
(e.g., tissue factor, plasminogen - activator (plaque)

remodel (25). glycoprotein IIb/IIIa (GPIIb/IIIa)

remodeling , 가 가 , fibrinogen factor VII 가가

remodeling remodeling PAI - 1 가 . noninfarct (ulcerated plaque)

zone , , 94%, 61% , 94% , remodel 55% .

4. 7. (20 ~ 30%) , , , , , Coro- nary Artery Surgery Study(CASS) 가 6 가 59% , 82% .

(23).

5. 40 ~ 50%가 (ST -) 가 가 (24).

6. 가 (aortic dissection) 가

ST -) transmural (

: , Q) .

1 ,

가 10.5% 6.2% remodeling ,

12.5% 가 (28).

9.7% Q Q

(26). 1 가

ST - .

1

6.2%, 3.0% 1. ST -

가 (27). ST -

가 fibrin .

ST - .

가

2 stent ,

20.3%, 가 GPIIb/IIIa abciximab 가

13%, 13%, 가

6.9% (26). patency

가 1) (Fibrinolytic Therapy)

가 (29),

가 stroke

ST - ,

가

aspirin 가

가

(nontransmural, : , Q .

2)

(Percutaneous Coronary Intervention)

4.

clopidogrel

warfarin

가

(30).

fibrate, statin

3) Stent

angiotensin

angiotensin

가

GPIIb/IIIa

abcixi-

mab

stent

가

(31).

가

(12),

2. ST -

ST -

. Low molecular weight

heparin

GPIIb/IIIa

abciximab

(27).

3.

, nitrate

, angio-

가

tensin

24

(3).

24 ~ 48

2

가

가

가

가

5

3

aldose reductase
protein kinase C

1.

가

3

1

1

30

90%가

, 15

60~70%

2.

(1, 2).

가

가

가

3.

가 . ,

가 가 가 ,

가 가 .

가 가 가 (bilateral symmetric polyneuropathy). (sensory)

가 (mononeuropathy),

가 (mononeuropathy multiplex).

가 (motor nerve)

가 ,

가 (diabetic ophthalmoplegia).

angio- , 가

tensin 가 (radiculopathy). mononeuropathy

가 , 3 (2).

(autonomic neuropathy)

가 UKPDS , postural hypotension), , ,

(1). 가 (diabetic gastroparesis)

가 , (

, diabetic diarrhea), 가

(, neurogenic bladder),

(impotence)가 .

가 ,

가 .

가 ,

가 .

가 , erythromycin
가 가 , motilin
가 opioid receptor
가 loperamide , cloni-
dine elas-
(가 polyol) tic stocking, fludrocortisone
caffeine .
aldose reductase 가 , alpha blocker
inhibitor, .
prostaglandin
가
가 ,
Hachinski Ischemic Score가 MRI ,
unidentified ,
bright object(lacunar infact)가 가
amitryptylene trazodone , ,
tabetic pain dilantin, neurontin
. mononeuropathy tegretol .
가 ,

7. Neil HA, Seagroatt V, Betteridge DJ, Cooper MP, Durrington PN, Hunphries SE, et al. Established and emerging coronary risk factors in patients with heterozygous familial hypercholesterolaemia. *Heart* 2004; 90: 1431 - 7
8. 2001; 25: 384 - 98
9. Hochman JS, McCabe CH, Stone PH, Becker RC, Cannon CP, Braunwald E, et al. Outcome and profile of women and men presenting with acute coronary syndromes: a report from TIMI IIIB. Thrombolysis in Myocardial Infarction. *J Am Coll Cardiol* 1997; 30: 141 - 8
10. Gu K, Cowie CC, Harris MI. Diabetes and decline in heart disease mortality in US adults. *JAMA* 1999; 281: 1291 - 7
11. Haffner SM, Lehto S, Ronnema T, Pyorala K, Laakso M. Mortality from coronary heart disease in subjects with type 2 diabetes and in nondiabetic subjects with and without prior myocardial infarction. *N Engl J Med* 1998; 339: 229 - 34
12. Malmberg K. Prospective randomised study of intensive insulin treatment on long term survival after acute myocardial infarction in patients with diabetes mellitus. *Br Med J* 1997; 314: 1512 - 15
13. Malmberg K, Ryden L. Myocardial infarction in patients with diabetes mellitus. *Eur Heart J* 1988; 9: 259 - 64
14. Stone PH, Thompson B, Anderson HV, Kronenberg MW, Gibson RS, Braunwald E, et al. Influence of race, sex, and age on management of unstable angina and non - Q - wave myocardial infarction: the TIMI III registry. *JAMA* 1996; 275: 1104 - 12
15. Sprafka JM, Burke GL, Folsom AL, McGovern PG, Hahn LP. Trends in prevalence of diabetes mellitus in patients with myocardial infarction and effect of diabetes on survival. *Diabetes Care* 1991; 14: 537 - 43
16. Hammoud T, Tanguay JF, Bourassa MG. Management of coronary artery disease: therapeutic options in patients with diabetes. *J Am Coll Cardiol* 2000; 36: 355 - 65
17. Jokl R, Klein RL, Lopes - Virella MF, Colwell JA. Release of platelet plasminogen activator inhibitor 1 in whole blood is increased in patients with type II diabetes. *Diabetes Care* 1995; 18: 1150 - 5
18. Steinberg HO, Chaker H, Leaming R, Johnson A, Brechtel G, Baron AD. Obesity/insulin resistance is associated with endothelial dysfunction: implications for the syndrome of insulin resistance. *J Clin Invest* 1996; 97: 2601 - 10
19. Brownlee M, Vlassara H, Cerami A. Nonenzymatic glycosylation and the pathogenesis of diabetic complications. *Ann Intern Med* 1984; 101: 527 - 37
20. Moreno PR, Murcia AM, Palacios IF, Leon MN, Bernardi VH, Fallon JT, et al. Coronary composition and macrophage infiltration in atherectomy specimens from patients with diabetes mellitus. *Circulation* 2000; 102: 2180 - 4
21. Goraya TY, Leibson CL, Palumbo PJ, Weston SA, Killian JM, et al. Coronary atherosclerosis in diabetes mellitus: a population - based autopsy study. *J Am Coll Cardiol* 2002; 40: 946 - 53
22. Kip KE, Faxon DP, Detre KM, Yeh W, Kelsey SF, Currier JW, Roger VL. Coronary angioplasty in diabetic patients: the National Heart, Lung, and Blood Institute Percutaneous Transluminal Coronary Angioplasty Registry. *Circulation* 1996; 94: 1818 - 25
23. Weiner DA, Ryan TJ, Parsons L, Fisher LD, Chaitman BR, Tristani FE, et al. Significance of silent myocardial ischemia during exercise testing in patients with diabetes mellitus: a report from the Coronary Artery Surgery Study (CASS) Registry. *Am J Cardiol* 1991; 68: 729 - 34
24. Valensi P, Sachs RN, Harfouche B, Lormeau B, Paries J, Attali JR, et al. Predictive value of cardiac autonomic neuropathy in diabetic patients with or without silent myocardial ischemia. *Diabetes Care* 2001; 24: 339 - 43
25. Ceriello A. Coagulation activation in diabetes mellitus: the role

- of hyperglycaemia and therapeutic prospects. *Diabetologia* 1993; 36: 1119 - 25
26. Mak KH, Moliterno DJ, Granger CB, Miller DP, White HD, Topol EJ, et al. Influence of diabetes mellitus on clinical outcome in the thrombolytic era of acute myocardial infarction. *J Am Coll Cardiol* 1997; 30: 171 - 9
 27. Roffi M, Chew DP, Mukherjee D, Bhatt DL, White JA, Topol EJ, et al. Platelet glycoprotein IIb/IIIa inhibitors reduce mortality in diabetic patients with non - ST - segment - elevation acute coronary syndromes. *Circulation* 2001; 104: 2767 - 71
 28. Gheorghiade M, Goldstein S. Incomplete versus complete myocardial infarction. *Henry Ford Hosp Med J* 1991; 39: 263 - 4
 29. Fibrinolytic Therapy Trialists(FTT) Collaborative Group. Indications for fibrinolytic therapy in suspected acute myocardial infarction: collaborative overview of early mortality and major morbidity results from all randomised trials of more than 1000 patients. *Lancet* 1994; 343: 311 - 22
 30. Grines C, Patel A, Zijlstra A, Weaver WD, Granger C, Simes RJ. Primary coronary angioplasty compared with intravenous thrombolytic therapy for acute myocardial infarction: six - month follow up and analysis of individual patient data from randomized trials. *Am Heart J* 2003; 145: 47 - 57
 31. Stone GW, Grines CL, Cox DA, Garcia E, Tchong JE, Lansky AJ, et al. Comparison of angioplasty with stenting, with or without abciximab, in acute myocardial infarction. *N Engl J Med* 2002; 346: 957 - 66
 32. Gaede D, Vedel P, Larsen N, Jensen GVA, Parving HH, Pedersen O. Multifactorial intervention and Cardiovascular disease in patients with type 2 diabetes. *N Engl J Med* 2003; 348: 383 - 93



Peer Reviewer Commentary

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가 , 가

2

Steno - 2 가 가

가 ,