



Patient care and Medication during PCI

**Seoul. St. Mary's Hospital
Cardiovascular Center
RN. Jum Sik Kim**



Contents

- 1 Role of the coronary care unit**
- 2 Complication for PCI**
- 3 Patient assessment and management**
- 4 Medication during PCI**
- 5 Related Study**



1. The role of the coronary care unit

1. Patient assessment and management
2. Providing information and education
3. Physical care
4. Technical care
5. Developing a relationship and adapting to the patient needs

- ❖ *What are the sign and symptoms?*
- ❖ *What complications can occur?*



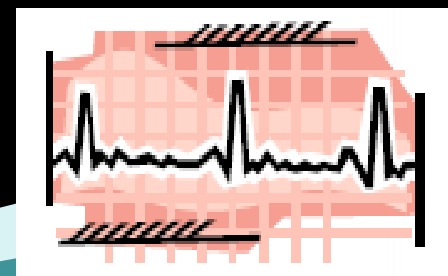
2. Complication

- ✓ Death
- ✓ Acute MI
- ✓ V.fibrillation
- ✓ Aortic dissection

- ✓ CVA
- ✓ Hemorrhage
- ✓ Contrast reaction
- ✓ Infection
- ✓ Cardiac perforation

3. Patient Assessment

- ✓ V/S monitoring
- ✓ EKG monitoring
- ✓ Chest pain
- ✓ Contrast reaction
- ✓ Bleeding
- ✓ Neurologic Examination



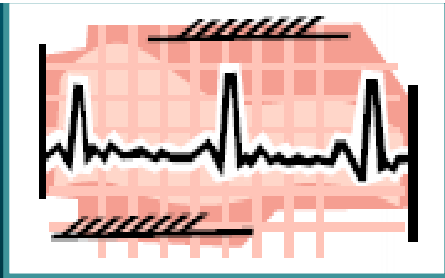
1) V/S monitoring



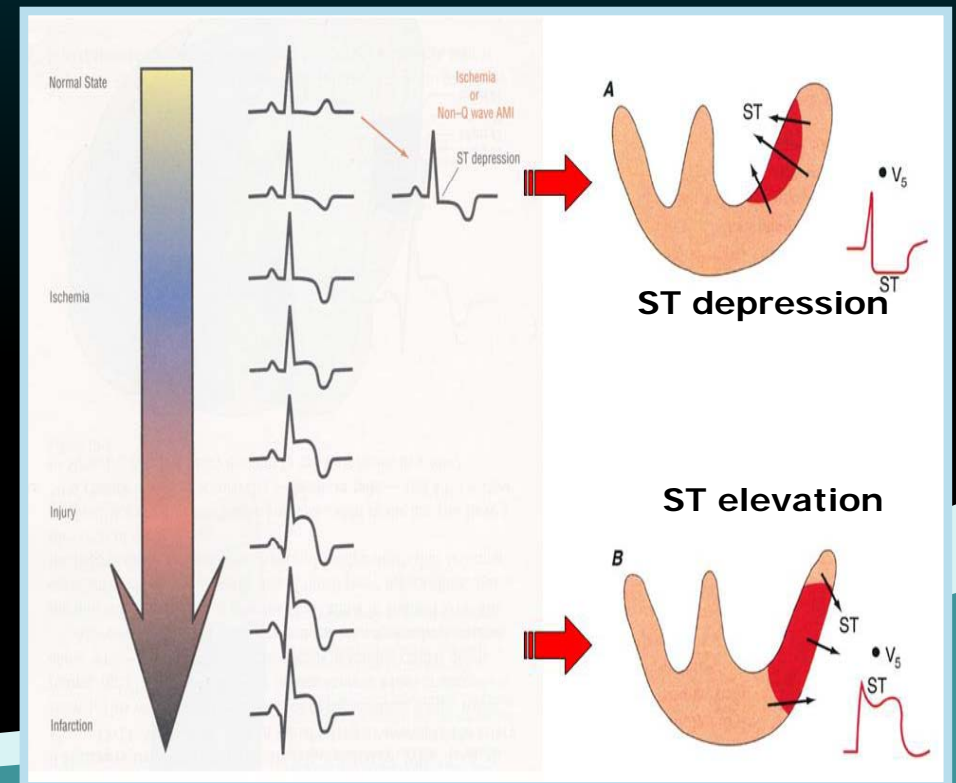
- Hypotension
 - dehydration
 - vasodilatation
 - cardiac tamponade
 - bleeding
- Tachycardia
- Bradycardia

* Hydration
* Inotropics
* IABP

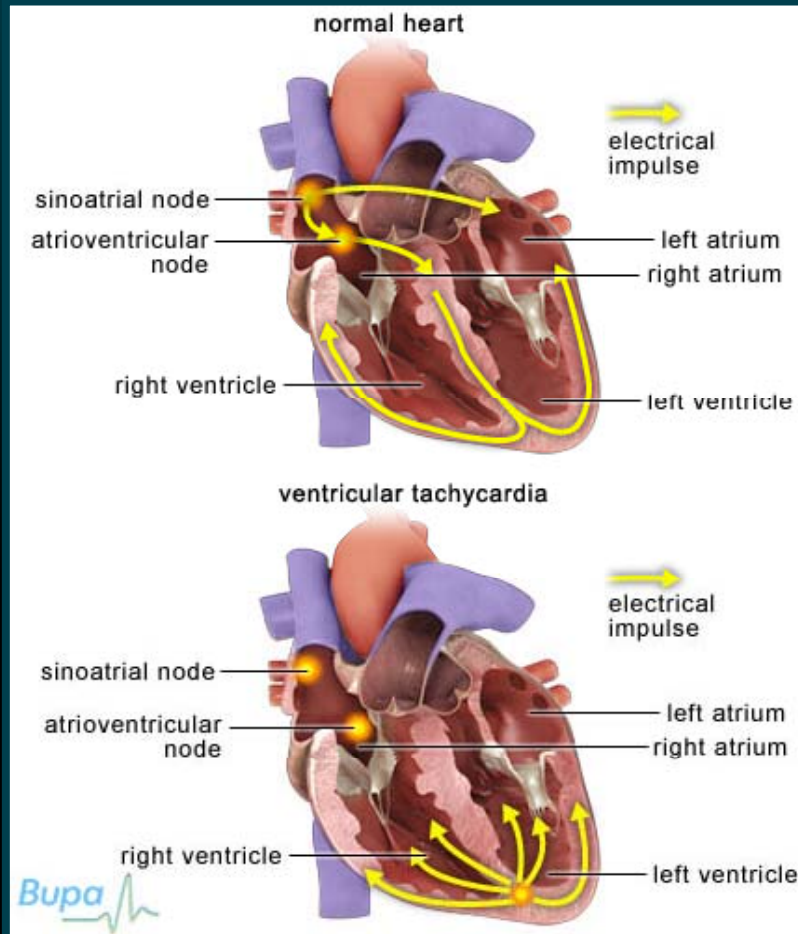
2) EKG monitoring



- ❖ Assess for ischemic events
- ❖ Arrhythmia
 - V. tachycardia
 - V. fibrillation
 - Bradycardia



2) EKG monitoring (V.tac)



Normal Sinus Rhythm

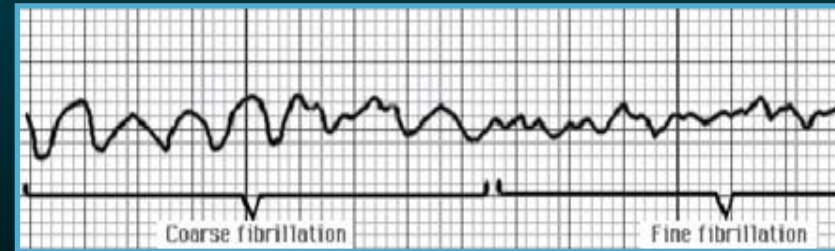
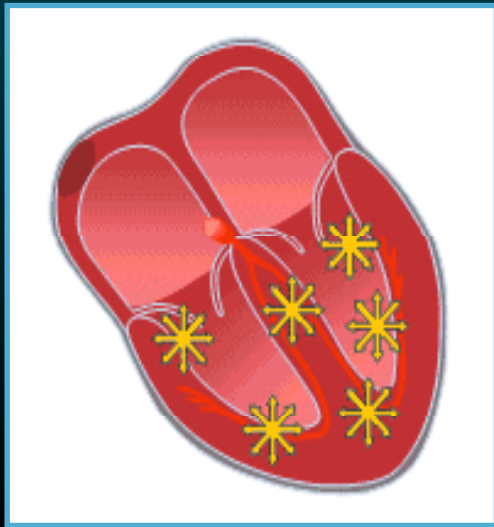


Ventricular Tachycardia

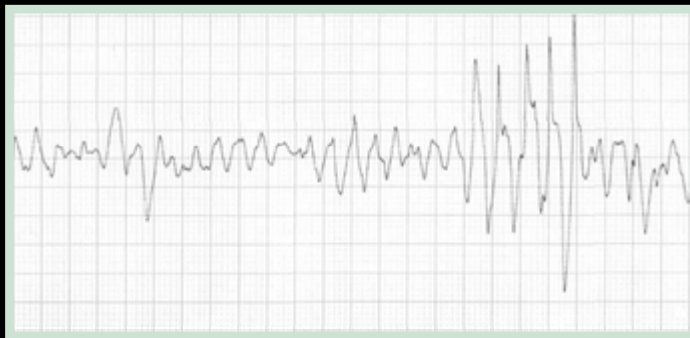


- 치료 : 일시적(<30초), 무증상 → observation
의식O, 맥박O → drug
의식X, 맥박X(emergency) → defibrillation

2) EKG monitoring (V.fib)



Defibrillation



150J



3) Chest pain

- Stent sensation
- Acute thrombosis
- Abrupt vessel closure
- Coronary spasm
- Side branch occlusion
- Distal embolization



*NTG SL, IC
O2 apply
Heparine iv*

4) Contrast reaction

- Skin rash
- Edema in nose and throat
- Vomiting
- Bronchospasm
- Cardiovascular collapse



- Airway opening
- O2 apply

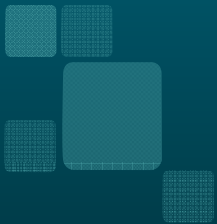
drug

- Epinephrine
- Antihistamines
- Steroids

5) Neurologic examination

- LOC
- Headache
- Seizure
- Speech disturbance
- Visual disturbance
- weakness





MEDICATION

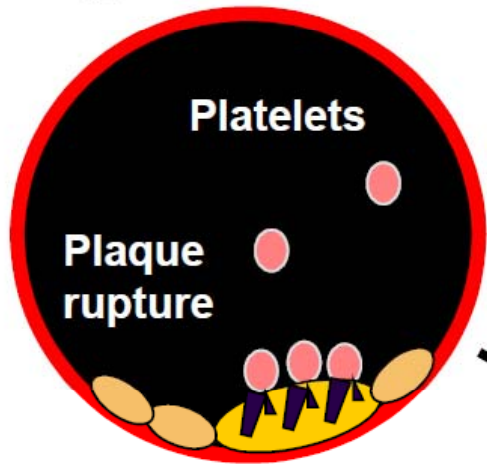
4. Medication



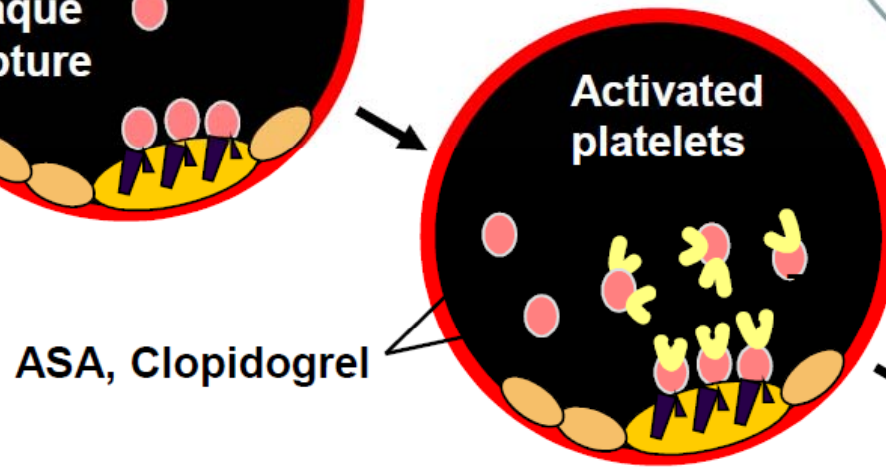
- ✓ **Antiplatelet** : abciximab, heparine, aspirin
- ✓ **Thrombolytics** : TPA, urokinase
- ✓ **Inotropic** : dopamine, dobutamine, epinephrine
norepinephrine
- ✓ **Vasodilator** : nitroglycerin, nicorandil
- ✓ **Emergency drug** : atropine, epinephrine
Sodium Bicarbonate

The Role of Platelets in Atherothrombosis

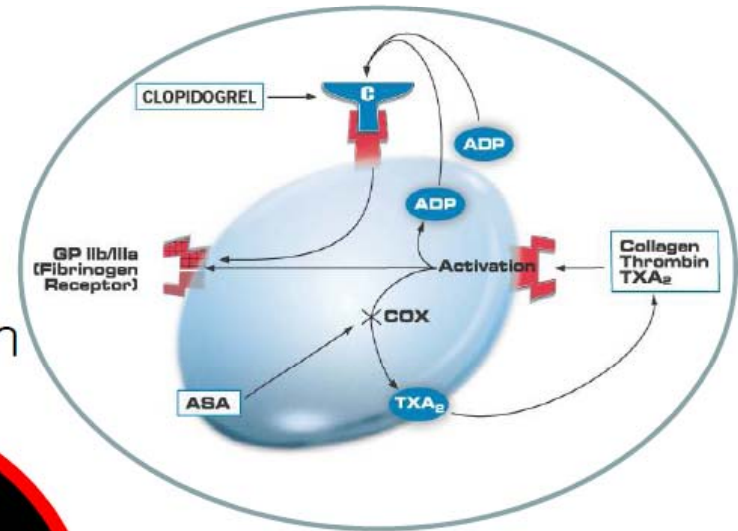
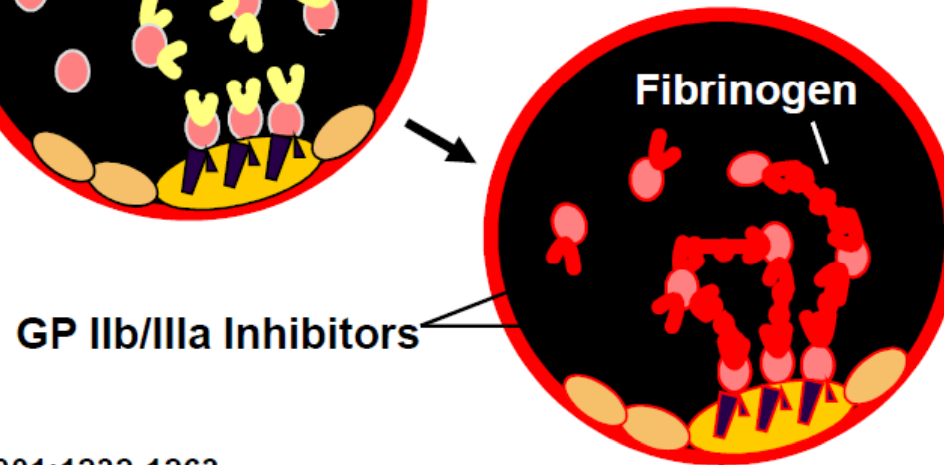
① • Adhesion



② • Activation



③ • Aggregation



Cannon, Braunwald, Heart Disease. 2001;1232-1263

Antiplatelet : abciximab



- Platelet glycoprotein IIb-IIIa receptor에 작용.
혈소판 응집억제, 혈전형성 억제, 혈전용해제제 작용 강화 .
- PTCA를 받는 환자 중 high risk 환자의 허혈성 심합병증 예방에 heparine, aspirin과 병용투여됨.

* high risk:

- STEMI
- New onset LBBB
- Previous MI
- Killip > 2
- EF<35%

Abciximab 1V = 10mg/5cc

1) 0.25mg/kg ic bolus

2) Bolus 10분 후 12시간 동안
0.125mcg/kg/min iv

GP IIb/IIIa Guideline 2009

STEMI

Early invasive / PCI		Medical Management	
ACC / AHA	ESC	ACC / AHA	ESC
Class IIa Abciximab	Class I Without stenting	Class IIb Abciximab with half-dose lytic for patients age < 75 years	Class III
Class IIb Tirofiban, eptifibatide	Class IIa With stenting		

UA & NSTEMI

Early invasive / PCI		Medical Management		
ACC / AHA	ESC	ACC / AHA	ESC	
Class I Either GPI or clopidogrel in addition to aspirin should be initiated before angiography	Class I (high risk)	Class I If subsequent recurrent symptom/Ischemia, heart failure, or serious arrhythmia occur, angiography should be performed with upstream use of either clopidogrel or GPI	Class II (high risk)	
Class IIa Reasonable to initiate antiplatelet therapy with both GPI and clopidogrel				Class IIa If recurrent ischemic discomfort with clopidogrel, it is reasonable to add a GPI before angiography
				Class IIb May be reasonable to add GPI to oral antiplatelet and anticoagulant therapy



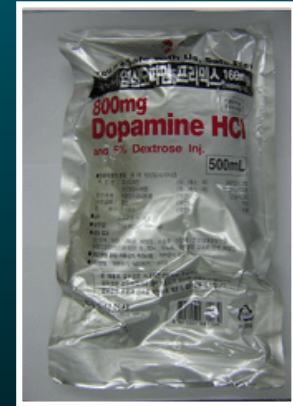
Antiplaetlet : heparine



- Fibrinogen이 fibrin으로 전환되는 것을 방해
 - >thrombus형성을 억제
- Aspirin과 상호 보완작용
 - ✓ AMI환자에서 조기투여 되어야함
 - ✓ initial dose를 bolus iv하고 이후 maintain
 - ✓ 8시간마다 aPTT를 해서 optimal range를 유지
(recommmend ACT between 180 and 200sec)

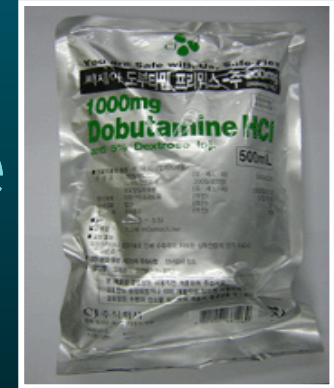
Inotropics : dopamin

교감신경 흥분제로 심근의 β_{1} -수용체에 대한 직접작용과 norepinephrine을 유리시키는 간접작용



- 2~5ug/kg/min의 용량에서는 신장, 뇌에 존재하는 도파민 수용체에 작용하여 선택적으로 혈관 확장을 일으킴. 또한 신혈류와 관계없이 신장에서 나트륨의 분비를 증가시킴.
- 5~10ug/kg/min의 용량에서는 작용하여 심근수축력과 심박수를 증가시킴.
- 10ug/kg/min이상의 용량에서는 alpha수용체에 작용하여 말초혈관을 수축시킴.

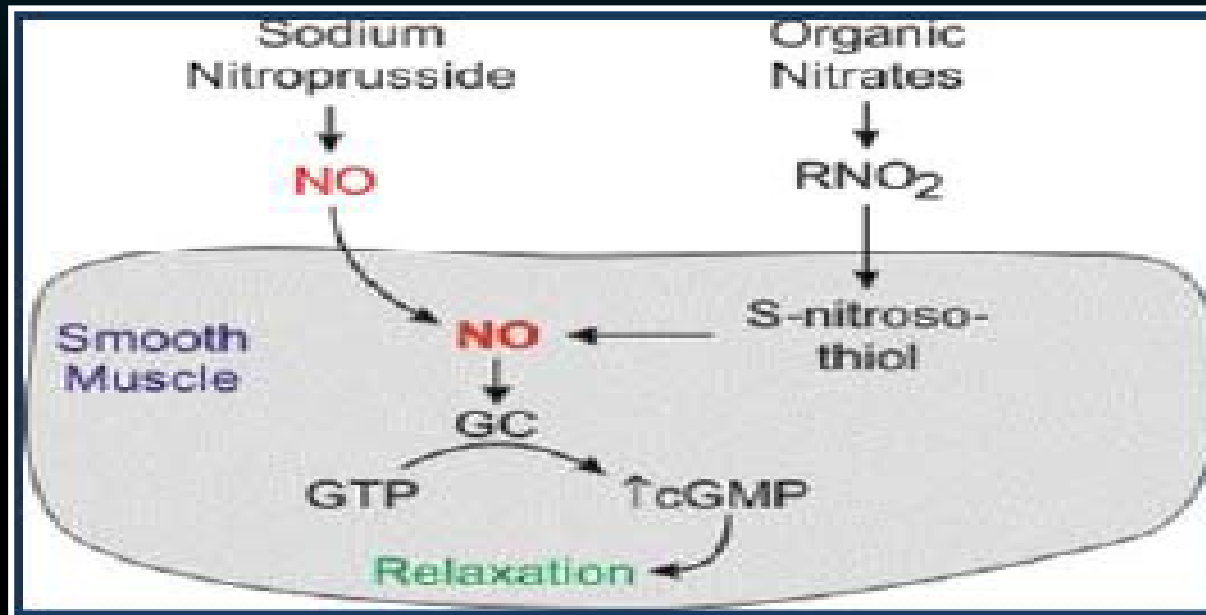
Inotropics : dobutamine



- $\beta < 1 >$ agonist로 구조 및 약리작용이 dopamine 과 유사함.
- 심박출량의 증가와 말초혈관 저항의 감소가 비슷하게 발생함.
- 심박수의 증가보다는 심근 수축력을 많이 증가시킴.
- Dopamine과 비교 : 심박출량의 증가가 더 많고 심부정맥의 발생률이 낮다. 대부분 심부전에서 가장 먼저 사용됨.

Vasodilator : nitroglycerin

- 허혈성 심질환에서 오랫동안 사용되고 있는 약물.
- 혈관의 내피세포에서 산화질소(nitric oxide:NO)생성의 기질로 작용.
- 산화질소는 cGMP를 생성함으로써 혈관평활근을 이완시키는 작용.



Vasodilator : nicorandil

- 관상혈관을 선택적으로 확장시킴($K\{+\}$ channel opener)
- $K\{+\}$ channel opening action : 굵은 관동맥과 미세관동맥을 확장시키고 심장보호작용을 나타냄.
- 심박수, 자극전도계, 심근수축력에 대해 거의 영향을 미치지 않음.
- 불안정 협심증 치료, 고령자, 심부전 환자, 방실 block이 있는 환자의 협심증에도 유용함





TAP Study

The long term effect of Thrombus Aspiration & Glycoprotein II b/III a inhibitor on Coronary Reperfusion during Primary PCI (**TAP**)

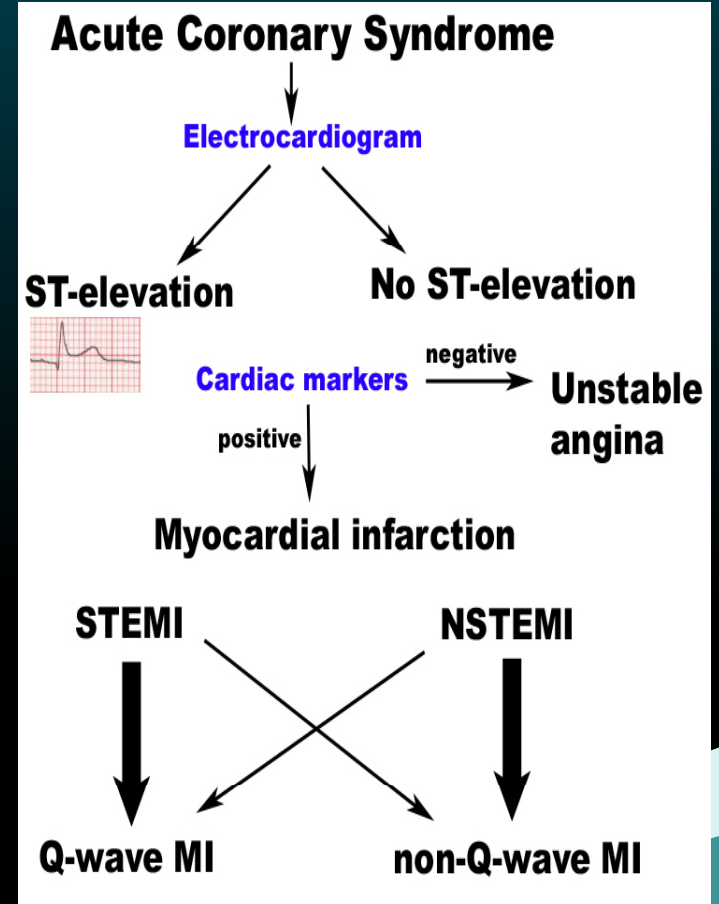


Purpose

- 급성 심근 경색 환자에게 있어서 혈전 흡인술과 Glycoprotein II b/III a 사용의 임상 성적 비교
- Glycoprotein II b/III a inhibitor(성분명:abciximab, 상품명:clotinab) 의 급성 심근 보호 효과
- Mechanical suction device 와 Glycoprotein II b/III a inhibitor 급성 심근경색 중재술에서의 장기적 예후

Inclusion

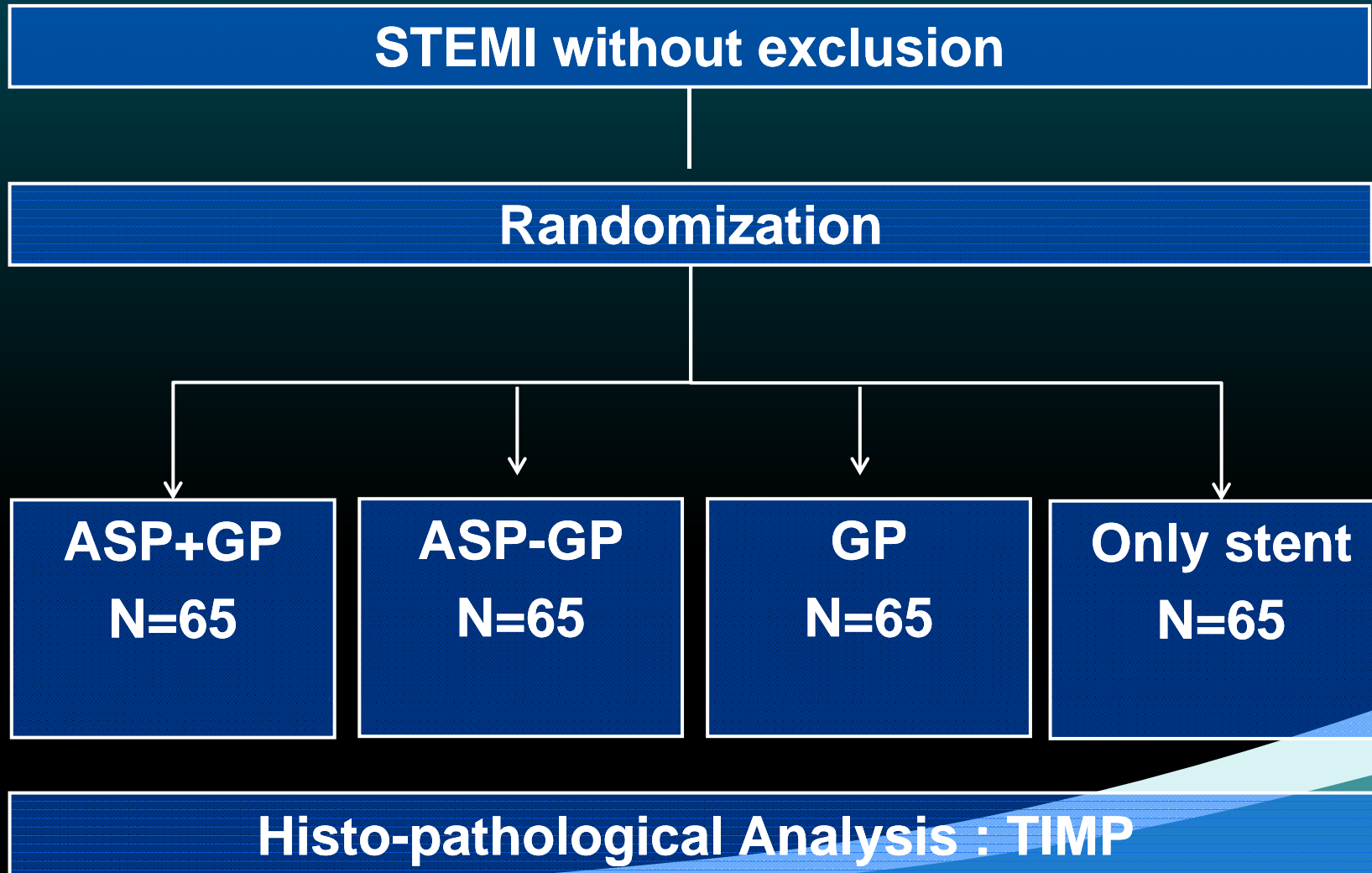
- Age ≥ 18
- 30분 이상의 chest pain 을 동반하고 두가지 이상 의 전극에서 ST segment elevation (0.1mV 이상)
- 이전 과거력상 동일 혈관에 혈관 중재 시술을 시행 받은 적이 없는 환자



Exclusion

- previous PCI and CABG
- ISR
- bleeding diathesis
- previous myocardial infarction
- LBBB
- recent stroke
- oral anticoagulant therapy
- thrombolytic agents for the current episode
- uncontrolled hypertension
- recent surgery
- contraindications to therapy with abciximab, aspirin, clopidogrel or heparin

Study Design



Endpoint

Primary

- binary in-segment restenosis rate at 8 month angiographic follow up

Secondary

- death; MI, TLR, TVR
- composites of death, MI, TLR/TVR, stent thrombosis
- Device success, defined as an in-segment final diameter stenosis $\leq 50\%$
- in-stent binary restenosis rate and late loss, both in-stent and in-segment.
- Q-wave MI / Non-Q-wave MI
- Stent thrombosis