BUSCA COCHRANE LIBRARY **METALYSE PARA INFARTO AGUDO DO MIOCARDIO**

INFARTO AGUDO DO MIOCARDIO

("Myocardial Infarction"[Mesh]) OR (Infarction, Myocardial) OR (Infarctions, Myocardial) OR (Myocardial Infarctions) OR (Myocardial Infarct) OR (Infarct, Myocardial) OR (Infarcts, Myocardial) OR (Myocardial Infarcts)

METALYSE

("tenecteplase "[Substance Name]) OR (Metalyse) OR (Boehringer Ingelheim brand of tenecteplase) OR (TNKase) OR (Hoffmann-La Roche brand of tenecteplase) OR (Genentech brand of tenecteplase)

AND

"Streptokinase"[Mesh] OR (Streptase) OR (Streptodecase) OR (Kabikinase) OR (Awelysin) OR (Celiase) OR (Distreptase) OR (Kabivitrum) OR (Avelizin)

PUBMED 28/01/2009

1: Chest. 2008 Jun;133(6 Suppl):708S-775S.

Erratum in:
Chest. 2008 Oct;134(4):892.

Acute ST-segment elevation myocardial infarction: American College of Chest
Physicians Evidence-Based Clinical Practice Guidelines (8th Edition).

Goodman SG, Menon V, Cannon CP, Steg G, Ohman EM, Harrington RA; American College
of Chest Physicians.

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This chapter about fibrinolytic, antiplatelet, and antithrombin treatment for
acute ST-segment elevation (STE) myocardial infarction (MI) is part of the
American College of Chest Physicians Evidence-Based Clinical Practice Guidelines
(8th Edition). Grade 1 recommendations are strong and indicate that the benefits
do, or do not, outweigh risks, burden, and costs. Grade 2 suggests that
individual patient values may lead to different choices (for a full understanding

of the grading see the chapter by Guyatt et al, CHEST 2008; 133[suppl]:123S-131S). Among the key recommendations in this chapter are the following: for patients with ischemic symptoms characteristic of acute MI of < or = 12 h in duration and persistent STE, we recommend that all undergo rapid evaluation for reperfusion (primary percutaneous coronary intervention [PCI] or fibrinolytic) therapy and have a reperfusion strategy implemented promptly after contact with the health-care system (Grade 1A). For patients with ischemic symptoms characteristic of acute MI of < or = 12 h in duration and persistent STE, we recommend administration of streptokinase, anistreplase, alteplase, reteplase, or tenecteplase over no fibrinolytic therapy (all Grade 1A). For patients with symptom duration < or = 6 h, we recommend the administration of alteplase or tenecteplase over streptokinase (both Grade 1A). We recommend aspirin over no aspirin therapy followed by indefinite therapy (Grade 1A); we also recommend clopidogrel in addition to aspirin for up to 28 days (Grade 1A).
In addition to aspirin and other antiplatelet therapies, we recommend the use of antithrombin therapy (eg, unfractionated heparin (UFH), enoxaparin, or fondaparinux) over no antithrombin therapy (Grade 1A), including for those patients receiving fibrinolysis (and regardless of which lytic agent is administered), primary PCI, or patients not receiving reperfusion therapy.

Publication Types:
    Practice Guideline

PMID: 18574277 [PubMed - indexed for MEDLINE]

2: Pharmacotherapy. 2007 Nov;27(11):1558-70.

Fibrinolytic agents for the management of ST-segment elevation myocardial infarction.

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Rapid reperfusion is the key treatment goal in patients with ST-segment elevation myocardial infarction (STEMI). The American College of Cardiology-American Heart Association (ACC-AHA) 2004 guidelines for the management of STEMI include

recommendations for pharmacologic reperfusion with use of fibrinolytic agents.
Fibrinolytic agents are the preferred pharmacologic class for the management of
STEMI because of their ability to achieve reperfusion and to restore blood flow
when administered within 12 hours of symptom onset. Four fibrinolytic agents are
approved for the treatment of STEMI in the United States- streptokinase,
alteplase, reteplase, and tenecteplase. Several clinical trials have demonstrated
the beneficial effects of these therapies in reducing mortality rates in patients
with suspected acute myocardial infarction. Alteplase is administered as an
intravenous infusion. However, the relatively long half-lives of reteplase and
tenecteplase enable bolus administration, which may be more convenient and less
time consuming. Reteplase is administered as a double bolus, and dosing does not
depend on the patient's weight; tenecteplase is administered as a single bolus,
and dosing is weight based. Adherence to the ACC-AHA guidelines, as well as
knowledge about the available fibrinolytic agents, is essential for physicians
and pharmacists to make informed decisions regarding appropriate pharmacologic
reperfusion strategies.

Publication Types:
    Comparative Study
    Research Support, Non-U.S. Gov't
    Review

PMID: 17963464 [PubMed - indexed for MEDLINE]

3: Circulation. 2007 Jun 5;115(22):2822-8. Epub 2007 May 21.

Comment in:
    Circulation. 2007 Jun 5;115(22):2796-8.

Outcomes and optimal antithrombotic therapy in women undergoing fibrinolysis for
ST-elevation myocardial infarction.

Mega JL, Morrow DA, Ostör E, Dorobantu M, Qin J, Antman EM, Braunwald E.

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BACKGROUND: The manifestations, complications, and outcomes of cardiovascular
disease differ between women and men. The safety and efficacy of pharmacological

reperfusion therapy in women with ST-elevation myocardial infarction are of particular interest. METHODS AND RESULTS: We investigated outcomes in the Enoxaparin and Thrombolysis Reperfusion for Acute Myocardial Infarction Treatment-Thrombolysis in Myocardial Infarction (ExTRACT-TIMI) 25 study, which randomized ST-elevation myocardial infarction patients with planned fibrinolysis to enoxaparin or unfractionated heparin. Compared with men (n=15,696), women (n=4783) were older and more likely to have hypertension and diabetes (P<0.001). The unadjusted 30-day mortality rate for women was >2-fold higher than for men (13.2% versus 5.4%; odds ratio, 2.66; 95% CI, 2.40 to 2.96). After adjustment for age, fibrinolytic therapy, revascularization, region, and elements of the TIMI Risk Score, women had a 1.25-fold-higher 30-day risk of death (95% CI, 1.08 to 1.46) but similar risk of intracerebral hemorrhage (adjusted odds ratio, 0.81; 95% CI, 0.52 to 1.26). The 30-day rate of death or nonfatal MI in women was reduced by enoxaparin compared with unfractionated heparin in women (15.4% versus 18.3%; P=0.007). Major bleeding was more frequent in women receiving enoxaparin compared with those receiving unfractionated heparin (2.3% versus 1.4%; P=0.022) but similar among women and men receiving enoxaparin (2.3% versus 2.0%; P=0.39). The rates of death, nonfatal myocardial infarction, or nonfatal major bleeding (net clinical benefit) were lower with enoxaparin (absolute risk reduction, 2.6% in women [P=0.02] and 1.6% in men [P=0.001]). CONCLUSIONS: In ExTRACT-TIMI 25, women presented with a profile of higher baseline risk and increased short-term mortality. In this large, contemporary clinical trial, women had similar relative and greater absolute risk reductions than men when treated with enoxaparin compared with unfractionated heparin as adjunctive therapy with fibrinolysis.

Publication Types:
    Multicenter Study
    Randomized Controlled Trial
    Research Support, Non-U.S. Gov't

PMID: 17515461 [PubMed - indexed for MEDLINE]

4: Coron Artery Dis. 2006 Aug;17(5):431-7.

Clinical and biochemical predictors affect the choice and the short-term outcomes of different thrombolytic agents in acute myocardial infarction.

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BACKGROUND: The presence of plasminogen activator inhibitor-1, angiotensin-converting enzyme and others may play a role in unsuccessful
recanalization after thrombolytic therapy. OBJECTIVES: To find out the clinical
and biochemical predictors that may affect the choice and short-term outcomes
following different thrombolytic agents in acute myocardial infarction.
METHODOLOGY: Angiotensin-converting enzyme and plasminogen activator inhibitor-1
plasma levels of 184 patients with acute myocardial infarction, treated with
streptokinase, metalyze or reteplase, were determined. Failure of thrombolysis
was assessed by noninvasive reperfusion criteria. Prolonged hospitalization,
impaired left ventricular ejection fraction and reinfarction were considered as
short-term outcomes. RESULTS: Patients who received streptokinase developed
higher incidence of >50% resolution of ST-segment elevation (82.5 vs. 64.7%,
P-value<0.05, in comparison with metalyze and 82.5 vs. 55.7%, P-value 0.001, in
comparison with reteplase) than those who received other thrombolytic agents.
High plasma angiotensin-converting enzyme was associated with prolonged
hospitalization (55, 63 and 94%, P<0.02) following streptokinase, metalyze and
reteplase, respectively. High plasma plasminogen activator inhibitor-1 is
associated with impaired left ventricular ejection fraction (55.3, 76.7 and
68.5%, P<0.09), ST resolution<50% (13.2, 36.7 and 37.5%, P=0.03), ST
resolution>50% (86.8, 63.3 and 62.5%, P=0.03) following streptokinase, metalyze
and reteplase, respectively. CONCLUSIONS: Rapid determination of pretreatment
angiotensin-converting enzyme and plasminogen activator inhibitor-1 plasma levels
in patients with acute myocardial infarction may influence the choice and
outcomes of the thrombolytic agents. The presence of a high plasma level of
either angiotensin-converting enzyme or plasminogen activator inhibitor-1 is
significantly associated with adverse short-term outcomes after treatment with
reteplase or metalyze.

Publication Types:
    Clinical Trial
    Randomized Controlled Trial
    Research Support, Non-U.S. Gov't

PMID: 16845251 [PubMed - indexed for MEDLINE]

5: J Thromb Thrombolysis. 2006 Jun;21(3):235-40.

The effect of high plasma levels of angiotensin-converting enzyme (ACE) and plasminogen activator inhibitor (PAI-1) on the reperfusion after thrombolytic therapy in patients presented with acute myocardial infarction.

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The resistance to thrombolytic agents and delays in reperfusion occur in more than 30% after acute myocardial infarction. This may play an important role in the unsuccessful recanalization after thrombolytic therapy. The aim of this study is to assess the clinical and biochemical markers of reperfusion after different types of thrombolytic therapy and to find out the relationship between PAI-1 and ACE serum levels and the short-term outcome. Pretreatment ACE and PAI-1 plasma levels of 184 patients with acute myocardial infarction, treated with thrombolytic therapy were determined. Failure of thrombolysis was considered when reperfusion was delayed as assessed by noninvasive reperfusion criteria, reinfarction, and impaired left ventricular function. High plasma level of ACE (> 50 U/L), PAI-1 (> 43 ng/ml) and both was found in 57, 108 and 32 patients respectively. Subjects with high ACE plasma levels were characterized by impaired LV systolic function (79.0% vs. 75.0%), new Q-wave (88.4% vs. 74.2%), less reperfusion arrhythmia (19.3% vs. 22.8%) and prolonged hospitalization (70% vs. 66%) but no statistical significance was observed. High enzymes levels of PAI-1 were observed with higher incidence of anterior myocardial infarction (50.0% vs. 41.0%), lesser ST segment resolution (65.6% vs. 58.8%), reinfarction (6.3% vs. 5.9%), and impaired LV systolic function (90.6% vs. 76.0%), and prolonged hospitalization (70.4% vs. 63.4). There was a statistically significant difference between thrombolytic agents in the presence of high ACE regarding

hospital overstay (p = 0.02). While the presence of high PAI-1 was significantly
affect the degree of ST-segment resolution (p = 0.03). CONCLUSION: High plasma
ACE and/or PAI-1 plays a considerable role in the higher incidence of unsuccessful reperfusion and impaired left ventricular function after thrombolytic therapy. A rapid diagnostic tool that enables physician of detecting
those enzymes before giving thrombolytic therapy may change the strategy of
treatment to offer another effective revascularization method.

Publication Types:
    Clinical Trial
    Randomized Controlled Trial
    Research Support, Non-U.S. Gov't

PMID: 16683215 [PubMed - indexed for MEDLINE]

6: Emerg Nurse. 2006 Feb;13(9):25-35.

Reperfusion therapy.

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In this article Nick Castle explains that, with significant improvements being
made to the emergency management of cardiac patients, emergency nurses should
challenge and develop their clinical practice to ensure patients receive prompt
and evidence based treatment.

Publication Types:
    Review

PMID: 16502632 [PubMed - indexed for MEDLINE]

7: Int J Cardiol. 2005 Aug 18;103(2):193-200.

Facilitated percutaneous coronary intervention (PCI) in patients with acute
ST-elevation myocardial infarction: comparison of prehospital tirofiban versus
fibrinolysis before direct PCI.

Möckel M, Bocksch W, Strohm S, Kühnle Y, Vollert J, Nibbe L, Dietz R.

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AIMS: Early start of treatment including coronary revascularization has been
recognized as crucial variable in the outcome of acute ST-segment elevation
myocardial infarction (STEMI). The lack of availability and the realisation that

an optimum reperfusion strategy will need to incorporate mechanical reperfusion as part of that strategy has led to a great deal of interest in pharmacologic reperfusion combined with mechanical reperfusion or facilitated PCI. It is not clear whether GPIIb/IIIa-blockade or fibrinolysis better facilitates PCI.
METHODS: We identified 138 patients who have been primarily treated by our mobile emergency care mobile from July 2001 until February 2003 with tirofiban or fibrinolysis. Seventy-nine patients had ST-elevation myocardial infarction (STEMI) and available angiograms within 24 h. RESULTS: Forty-four patients had tirofiban (TIRO; 60.6 S.D. 11.4 years, 64% male) and 35 patients underwent fibrinolysis (FIB; 31.4% tenecteplase, 54.3% reteplase, 11.4% alteplase, 2.9% streptokinase; 58.8 S.D. 12.2 years, 80% male). Data were analyzed with respect to TIMI-flow and corrected frame count (cTFC) before and after PCI, bleeding complications at 30 days and long-term follow up for major adverse events (median 288 days; MACE: Death, hospitalized re-infarction, intracranial hemorrhage).
Catheter films were re-analyzed by an investigator blinded to the prehospital therapy. Time from onset of symptoms to first medical contact was 1.98 h in TIRO compared to 0.5 h in FIB ($p<0.001$) and time from first prehospital medical contact to catheter was 1.46 h in the TIRO compared to 2.85 h in the FIB group ($p<0.001$). TIMI 3-flow before PCI was observed in 20.5% of TIRO and 62.9% in FIB ($p<0.001$). After PCI TIMI 3-flow was achieved in 90.5% and 90.0%, respectively (p=n.s.). Final cTFC was 24 in TIRO and 29 in FIB (p=n.s.). Visible thrombi were detected in 30.2% in TIRO and 23.5% in FIB (p=n.s.). Major bleeding occurred in one TIRO patient (fatal lung bleeding after ultima ratio abciximab on top of tirofiban), 2 patients (4.5%) received transfusions. In FIB 2 intracerebral hemorrhages, 5 transfusions (14.3%) and 3 pulmonary bleedings during mandatory ventilation were observed. After 30 days 4.5% in TIRO and 22.9% in FIB had MACE ($p=0.015$). During long-term follow up the primary endpoint was observed in 4.5% of TIRO and 28.6% ($p=0.003$) of FIB. Two patients died in TIRO and 9 patients in FIB. CONCLUSIONS: We conclude that (1) prehospital start of tirofiban for facilitated PCI is safe and effective if administered by experienced emergency

physicians; (2) routine fibrinolysis should be limited to areas where catheter
based therapy is not available within 90 min and (3) fibrinolysis should be given
for facilitated PCI in randomized trials only at the moment.

Publication Types:
    Comparative Study
    Research Support, Non-U.S. Gov't

PMID: 16080980 [PubMed - indexed for MEDLINE]

8: Am Heart J. 2005 Apr;149(4):670-4.

Incidence, predictors, and outcomes of high-degree atrioventricular block
complicating acute myocardial infarction treated with thrombolytic therapy.

Meine TJ, Al-Khatib SM, Alexander JH, Granger CB, White HD, Kilaru R, Williams K,
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BACKGROUND: In the fibrinolytic era, several studies have suggested that the rate
of atrioventricular block (AVB) in the setting of acute myocardial infarction
(MI) is high and is associated with increased short-term mortality. We sought to
delineate predictors of AVB and determine long-term mortality of patients
developing AVB in the setting of ST-segment elevation MI (STEMI) treated with
thrombolytic therapy. METHODS: We combined data on patients from 4 similar
studies of STEMI. We identified independent predictors of AVB and compared the
6-month and 1-year mortality rates of patients with AVB (5251) to the rates of
patients without AVB (70 742). RESULTS: The incidence of AVB was 6.9%.
Significant independent predictors of AVB included inferior MI, older age, worse
Killip class at presentation, female sex, enrollment in the United States,
current smoking, hypertension, and diabetes. Adjusted mortality was significantly
higher in patients with AVB than in patients without AVB within 30 days (OR 3.2,
95% CI 2.7-3.7), 6 months (OR 1.6, 95% CI 1.5-1.8), and 1 year (OR 1.5, 95% CI
1.3-1.6). For patients with AVB and inferior MI, mortality odds ratios (ORs) were
2.2 (95% CI 1.7-2.7), 2.6 (95% CI 2.4-2.9), and 2.4 (95% CI 2.2-2.6) within 30
days, 6 months, and 1 year, respectively. For patients with AVB and anterior MI,

mortality ORs were 3.0 (95% CI 2.2-4.1), 3.5 (95% CI 3.1-3.8), and 3.3 (95% CI
3.0-3.7) within 30 days, 6 months, and 1 year, respectively.
CONCLUSIONS: In the
thrombolytic era, AVB in the setting of STEMI is common and associated with
higher mortality. Future studies should focus on determining therapies that are
effective at reducing mortality rates in such patients.

Publication Types:
    Meta-Analysis

PMID: 15990751 [PubMed - indexed for MEDLINE]

9: J Endovasc Ther. 2005 Apr;12(2):224-32.

Thrombolytic therapies: the current state of affairs.

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Thrombotic occlusive diseases are manifested in several disorders that have
significant morbidity and mortality, including acute myocardial infarction,
pulmonary embolism, deep venous thrombosis, and cerebrovascular accidents. This
review summarizes the recently published literature covering thrombolytic
therapies in these diseases, with particular attention to comparisons between the
fibrin-specific tissue plasminogen activators (alteplase, reteplase, and
tenecteplase) and the nonfibrin-specific activators (streptokinase or urokinase
plasminogen activator). These agents act to convert plasminogen to plasmin, which
in turn cleaves fibrin as part of the lysis process. Fibrin-specific activators
were anticipated to be more efficacious and safer than nonspecific agents in
thrombolytic occlusive diseases because of their pathophysiologically restricted
mechanism of action. However, the fibrin-specific activators also lyse
physiological hemostatic plugs, which can result in costly adverse events.
Efficacy of fibrin-specific tissue plasminogen activators has been shown to be
generally equivalent, with similar mortality rates compared with nonspecific
agents; however, fibrin-specific agents may be associated with an increased
incidence of intracerebral hemorrhage and with increased costs. Therefore, it
appears that given equivalent efficacy, nonfibrin-specific activators, such as
streptokinase or urokinase, may be a safer choice in many thrombotic situations.

Publication Types:
    Review

PMID: 15823070 [PubMed - indexed for MEDLINE]

10: Am J Cardiol. 2005 Mar 1;95(5):611-4.

Comparison of ST-segment resolution with combined fibrinolytic and glycoprotein
IIb/IIIa inhibitor therapy versus fibrinolytic alone (data from four clinical
trials).

Rebeiz AG, Johanson P, Green CL, Crater SW, Roe MT, Langer A, Giugliano RP,
Lincoff AM, Newby LK, Harrington RA, Topol EJ, Califf RM, Wagner GS, Krucoff MW.

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We compared combination fibrinolytic plus glycoprotein IIb/IIIa inhibitor therapy
with stand-alone fibrinolysis with respect to speed and stability of reperfusion
in patients who had acute ST-segment elevation myocardial infarction; data were
obtained from 654 patients in 4 trials (Integrilin to Manage Platelet Aggregation
to Combat Thrombosis in Acute Myocardial Infarction, Platelet Aggregation
Receptor Antagonist Dose Investigation and Reperfusion Gain in Myocardial
Infarction, Integrilin and Tenecteplase in Acute Myocardial Infarction, and the
Fifth Global Use of Strategies to Open Occluded Coronary Arteries) that compared
thrombolytics plus lamifiban, eptifibatide, or abciximab with standard
thrombolysis. We found significantly faster and more stable ST-segment recovery
with combination therapy starting at 60 minutes (56.7% vs 48.0% with >/=50%
ST-segment resolution, p = 0.03) and sustained over 180 minutes after drug
administration; this transient benefit may suggest a time frame when more optimal
percutaneous coronary intervention can be performed.

Publication Types:
    Comparative Study

PMID: 15721101 [PubMed - indexed for MEDLINE]

11: South Med J. 2004 Oct;97(10):1015-7.

Tenecteplase and return of spontaneous circulation after refractory cardiopulmonary arrest.

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Even with the benefit of cardiopulmonary resuscitation, the prognosis of cardiac
arrest remains poor. Multiple case series describe survival with the use of
thrombolytic therapy for refractory cardiac arrest. Presumably thrombolysis
treats that subset of cardiac arrest cases resulting from fulminant pulmonary
embolism, or perhaps massive myocardial infarctions. Published reports to date
have dealt exclusively with streptokinase, urokinase, reteplase, or recombinant
tissue plasminogen activator. The authors report the first case of return of
spontaneous circulation with the administration of tenecteplase. Tenecteplase is
a recently developed reengineered isomer of tissue plasminogen activator that
possesses many properties of the ideal cardiac arrest thrombolytic agent. It is
bolus dosed, stable at room temperature before reconstitution, and is compatible
with most other advanced cardiac life support medications. Because of clinical
equivalency and its logistical advantages, tenecteplase should be evaluated as an
alternative to other thrombolytics in future trials involving cardiac arrest.

Publication Types:
    Case Reports

PMID: 15558935 [PubMed - indexed for MEDLINE]

12: Chest. 2004 Sep;126(3 Suppl):549S-575S.

Thrombolysis and adjunctive therapy in acute myocardial infarction: the Seventh
ACCP Conference on Antithrombotic and Thrombolytic Therapy.

Menon V, Harrington RA, Hochman JS, Cannon CP, Goodman SD, Wilcox RG, Schünemann
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This chapter about antithrombotic therapy for acute myocardial infarction (MI) is
part of the Seventh ACCP Conference on Antithrombotic and Thrombolytic Therapy:
Evidence Based Guidelines. Grade 1 recommendations are strong and indicate that
the benefits do, or do not, outweigh risks, burden, and costs. Grade 2 suggests
that individual patients' values may lead to different choices (for a full

understanding of the grading see Guyatt et al, CHEST 2004; 126:179S-187S). Among the key recommendations in this chapter are the following: For patients with ischemic symptoms characteristic of acute MI of < 12 h in duration, and ST-segment elevation or left bundle-branch block (of unknown duration) on the ECG, we recommend administration of any approved fibrinolytic agent (Grade 1A). We recommend the use of streptokinase, anistreplase, alteplase, reteplase, or tenecteplase over placebo (all Grade 1A). For patients with symptom duration < 6 h, we recommend the administration of alteplase over streptokinase (Grade 1A). For patients with known allergy or sensitivity to streptokinase, we recommend alteplase, reteplase, or tenecteplase (Grade 1A). For patients with acute posterior MI of < 12 h duration, we suggest fibrinolytic therapy (Grade 2C). In patients with any history of intracranial hemorrhage, closed head trauma, or ischemic stroke within past 3 months, we recommend against administration of fibrinolytic therapy (Grade 1C+). For patients with acute ST-segment elevation MI whether or not they receive fibrinolytic therapy, we recommend aspirin, 160 to 325 mg p.o., at initial evaluation by health-care personnel followed by indefinite therapy, 75 to 162 mg/d p.o. (both Grade 1A). In patients allergic to aspirin, we suggest use of clopidogrel as an alternative therapy to aspirin (Grade 2C). For patients receiving streptokinase, we suggest administration of either i.v. unfractionated heparin (UFH) [Grade 2C] or subcutaneous UFH (Grade 2A). For all patients at high risk of systemic or venous thromboembolism (anterior MI, pump failure, previous embolus, atrial fibrillation, or left ventricular thrombus), we recommend administration of IV UFH while receiving streptokinase (Grade 1C+).

Publication Types:
    Comparative Study
    Guideline
    Practice Guideline
    Review

PMID: 15383484 [PubMed - indexed for MEDLINE]

13: Scand Cardiovasc J. 2003 Dec;37(6):316-23.

Results from clinical trials on ST-elevation myocardial infarction in a historic perspective with some pathophysiological aspects.

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OBJECTIVE: Since the publication of the large trials on streptokinase and aspirin improving mortality related to an acute ST-elevation myocardial infarction (STEMI) there has been numerous studies on improving treatment results with new fibrinolytics, adjuvant heparin therapy and primary percutaneous intervention (PCI). The aim of the present overview is, in a historic perspective, to link some of the pathophysiology of mechanisms related to plaque rupture and following thrombosis to the effects of drug combinations and PCI observed in major clinical trials conducted in patients with STEMI. DESIGN: The overview comprises short analyses of the initial streptokinase trials (GISSI-1 and ISIS-2), the comparisons between streptokinase and tissue plasminogen activator (rt-PA) and the role of adjuvant heparin treatment (GISSI-2, ISIS-3, GUSTO I). Also included is the comparison between the new bolus-teplases and traditional, accelerated infusion of rt-PA (GUSTO III and ASSENT-2) and between unfractionated heparin (UFH) and low molecular weight heparin (LWMH) given in addition to tenecteplase (ASSENT-3). The pathophysiology of the antiplatelet and antithrombin effects is described, in order to elucidate the treatment differences observed in the trials. In addition, the role of primary PCI is discussed in view of the results in a recent meta-analysis of controlled comparisons with fibrinolytic therapy.
RESULTS: Based upon these trials it seems that the optimal thrombolytic treatment is a combination of a bolus-teplase (tenecteplae) and LMWH given on top of aspirin. Primary PCI may be the most optimal treatment, provided given early following STEMI (<1 h), but whether PCI is the best alternative for all patients with STEMI is still a matter of debate. CONCLUSION: During the last 15 years the optimal antithrombotic treatment of STEMI has developed from a combination of streptokinase and aspirin to the new bolus-teplases combined with LMWH and aspirin. The use of primary PCI may be a better alternative than fibrinolytic therapy, but such a statement needs confirmation in a large comparison between PCI and a quick infusion of modern fibrinolytic agents.

Publication Types:
    Review

PMID: 14668180 [PubMed - indexed for MEDLINE]

14: Am Heart J. 2003 Dec;146(6):958-68.

Current perspectives on reperfusion therapy for acute ST-segment elevation
myocardial infarction: integrating pharmacologic and mechanical reperfusion
strategies.

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The therapeutic approach to patients with acute ST-segment elevation myocardial
infarction (STEMI) has advanced rapidly over the past decade. Intravenous
fibrinolytic therapy remains the most common form of reperfusion therapy
worldwide, since fibrinolytics are associated with a dramatic reduction in
mortality rates. However, primary percutaneous coronary intervention (PCI) is
associated with improved outcomes and less bleeding complications compared with
fibrinolytic therapy, but it is not widely available. Adjunctive therapies with
intracoronary stents, glycoprotein (GP) IIb/IIIa inhibitors, and more potent
antithrombin agents have shown great promise for the initial treatment of STEMI
and have stimulated further investigation of combined pharmacological/mechanical
reperfusion strategies that may be synergistic. Although the optimal combination
of fibrinolytics, antiplatelet agents, antithrombins, and mechanical reperfusion
at hospitals with and without primary PCI facilities remains elusive, results
from recent studies suggest that such a combined approach may facilitate transfer
of patients with STEMI from a referral hospital to an invasive hospital for
definitive primary PCI after administration of a potent pharmacologic regimen
designed to enhance early infarct-related artery reperfusion. Thus, as the
reperfusion era continues to evolve, the ideal treatment strategy for patients
with STEMI is being redefined to integrate pharmacologic and mechanical
approaches to reperfusion.

PMID: 14660986 [PubMed - indexed for MEDLINE]

15: Health Technol Assess. 2003;7(15):1-136.

Early thrombolysis for the treatment of acute myocardial infarction: a systematic
review and economic evaluation.

Boland A, Dundar Y, Bagust A, Haycox A, Hill R, Mujica Mota R, Walley T, Dickson
R.

Liverpool Reviews and Implementation Group, New Medical School, Liverpool, UK.

Publication Types:
    Review

PMID: 12773258 [PubMed - indexed for MEDLINE]

16: QJM. 2003 Feb;96(2):155-60.

Comment on:
    QJM. 2003 Feb;96(2):103-13.

Superiority and equivalence in thrombolytic drugs: an interpretation.

Walley T, Dundar Y, Hill R, Dickson R.

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Publication Types:
    Comment
    Review

PMID: 12589013 [PubMed - indexed for MEDLINE]

17: QJM. 2003 Feb;96(2):103-13.

Comment in:
    QJM. 2003 Feb;96(2):155-60.

Comparative efficacy of thrombolytics in acute myocardial infarction: a
systematic review.

Dundar Y, Hill R, Dickson R, Walley T.

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BACKGROUND: The comparative clinical effectiveness of new (reteplase, tenecteplase) vs. older (alteplase, streptokinase) thrombolytic agents in the
treatment of acute myocardial infarction is uncertain. Aim: To examine 30-35 day
mortality and major adverse effects of thrombolytic agents in the treatment of
acute myocardial infarction. DESIGN: Systematic review of randomized controlled
trials comparing the clinical efficacy of included drug regimens. METHODS: We

searched MEDLINE, EMBASE, Science Citation Index/Web of Science from 1980 to
December 2001, and the Cochrane Library (2001, Issue 4). Reference lists of
included studies and a number of medical journals were hand searched. Randomized
controlled trials that compared any two of the included drugs provided to
patients in the early stages of acute myocardial infarction, were included.
Outcome measures included: mortality, bleeding, stroke, reinfarction, allergy and
anaphylaxis. RESULTS: We found 14 studies, total study population 142 907. For
available comparisons (all alteplase vs. streptokinase, reteplase vs.
streptokinase or alteplase, tenecteplase vs. alteplase), meta-analysis showed no
significant differences in mortality at 30-35 days. The GUSTO-I study showed an
apparent benefit of accelerated alteplase over streptokinase, but its inclusion
or exclusion made little difference. Total stroke and haemorrhagic stroke rates
were lower for streptokinase than for all alteplase combined (total stroke, OR
1.29, 95%CI 1.13-1.46; haemorrhagic stroke OR 1.83, 95%CI 1.14-2.93).
DISCUSSION:
All thrombolytic drugs appear to be of similar efficacy in reducing mortality,
and the apparent benefits of accelerated alteplase in GUSTO-I are consistent with
this. Whether accelerated alteplase is sufficiently different from other regimens
of administering alteplase to be excluded from a meta-analysis, and whether more
weight should be placed on a meta-analysis than on a single trial, are matters
for debate.

Publication Types:
    Comparative Study
    Meta-Analysis
    Review

PMID: 12589008 [PubMed - indexed for MEDLINE]

18: Thromb Res. 2001 Sep 30;103 Suppl 1:S51-5.

The thrombolytic paradox.

Hoffmeister HM, Szabo S, Helber U, Seipel L.

Medizinische Klinik, Abteilung Innere Medizin III, Eberhard-Karls-Universität,
Tübingen, Germany.

Thrombolytic drugs do not only stimulate the plasmin system but also induce
thrombin activation additionally to the preexisting hypercoagulative state in

patients with acute myocardial infarction. Testing the in vitro-derived hypothesis of a plasmin-mediated activation of the contact phase of the coagulation leading to the procoagulant effect, several thrombolytic regimen have been evaluated. Paradoxical thrombin activation (referred to as "thrombolytic paradox") was related to absence of fibrin specificity. Highly fibrin-specific drugs like tenecteplase did not cause additional thrombin activation, while non-fibrin-specific drugs like streptokinase caused a marked additional activation of the contact phase and of thrombin. It could be shown that the thrombolytic paradox was related to the extent of systemic plasmin activation confirming the hypothesis of a plasmin-mediated factor XII/kallikrein system activation as cause of the thrombolytic paradox.

Publication Types:
    Review

PMID: 11567669 [PubMed - indexed for MEDLINE]

19: Cardiology. 2001;95(2):55-60.

Platelet function and fibrinolytic agents: two sides of a coin?

Callahan KP, Malinin AI, Gurbel PA, Alexander JH, Granger CB, Serebruany VL.

Sinai Center for Thrombosis Research, Baltimore, MD 21215, USA.

Fibrinolytic therapy is the established treatment for the management of patients with ST elevation acute myocardial infarction (AMI). Present fibrinolytic regimens have a number of shortcomings, including the failure to produce early and sustained reperfusion, as well as failure to prevent reocclusion in at least some patients. Platelets play an important role in coronary thrombosis responsible for AMI. The effect of coronary fibrinolysis on platelets has been extensively debated in the literature with evidence of both platelet activation and inhibition. Among fibrinolytic agents, tissue plasminogen activator (t-PA) is considered to be the mainstay in the treatment of coronary artery disease. The native t-PA molecule has been modified in an attempt to achieve improved lytic characteristics with less risk of bleeding. The result is a group of mutant t-PA variants considered third-generation plasminogen activators. TNK-t-PA is one bioengineered variant of t-PA. Another third-generation plasminogen activator is

reteplase (r-PA). Like TNK-t-PA, it is a variant of t-PA that has been developed
to establish a more rapid, complete, and stable coronary artery patency, thus
promising reduced mortality. Both r-PA and TNK-t-PA are effective when given as
bolus therapy. This feature may facilitate more rapid treatment as well as
decrease overall costs of treatment. New fibrinolytic regimens include potent
antiplatelet agents that may improve sustained reperfusion. This review
summarizes the latest and often confusing data on the interaction between
fibrinolytic therapy and platelets in certain in vitro, animal and clinical
scenarios. Copyright 2001 S. Karger AG, Basel

PMID: 11423707 [PubMed - indexed for MEDLINE]

20: Internist (Berl). 2001 May;42(5):659-64.

[Thrombolytic therapy for acute myocardial infarct]

[Article in German]

Nordt TK, Bode C.

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Publication Types:
    Review

PMID: 11400573 [PubMed - indexed for MEDLINE]

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Cochrane Central Register of Controlled Trials (CENTRAL) 2008 Issue 4
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Title	Efficacy and safety of single-bolus tenecteplase compared with front-loaded alteplase in Chinese patients with acute myocardial infarction.
Author(s)	Liang F, Hu D, Shi X, Gao M, Wei J, Zhao H, Wang L, Jia S, Wang H, Liu R, Chen Y, Lu Y
Source	Journal of Geriatric Cardiology
Date of Publication	2007
Volume	4
Issue	3
Pages	137-41

Abstract	Background and Objective: Previous study showed tenecteplase and alteplaxe were equovalent for 30-day mortality in the treatment of acute myocardial infarction. The purpose of this open-label, randomized, multi-center, angiographic trial was to assess the efficacy and safety of tenecteplase compared with alteplase in Chinese patients with acute myocardial infarction. Methods: We recruited patients with acute ST-elevation myocardial infarction presenting within 6 hours of symptom onset from October, 2002 to March, 2004, in 5 hospitals in Beijing. After giving informed consent, patients were randomly assigned a single-bolus injection of tenecteplase (30-50 mg according to body weight) or front loaded alteplase (100 mg), and underwent coronary angiography at 90 min after starting the study drug. All patients received aspirin and heparin (target activated partial thromboplastin time 50-70 s). The primary efficacy end point was the rate of TIMI grade 3 flow at 90 minutes. Other efficacy end points included TIMI grade 2/3 flow at 90 minutes. Safety end points included all stroke, intracranial hemorrhage (ICH), moderate/severe hemorrhage (except for ICH), all-cause mortality at 30-days, and major non-fatal cardiac events at 30 days. Results: Overall 110 patients were eligible for statistical analysis, with 58 patients assigned to receive tenecteplase and 52 patients to alteplase. Tenecteplase produced a rate of TIMI grade 3 flow at 90 minutes after the start of thrombolysis (68.4%) similar to that of alteplase (66.7%, P=1.0); the rates of TIMI grade 2 or 3 were similar for patients treated with tenecteplase versus alteplase (89.5% versus 80.4%, respectively, P=0.278). At 30 days, rates for all strokes were similar for the two groups (5.17% for tenecteplase and 1.92% for alteplase, P=0.62); rates of ICH were 3.45% and 1.92% (tenecteplase and rt-PA, P=1.00) respectively. The rate of moderate/severe hemorrhage was 8.62% with tenecteplase and 5.77% with alteplase (P=0.72); total mortality was almost identical in the two groups (13.8% versus 9.6%, respectively, P=0.565) while the rates of non-fatal cardiac complications were 10.35% and 11.54% (tenecteplase and alteplase, P=1.0). Conclusions: The efficacy of a single-bolus, weight-adjusted tenecteplase fibrinolytic regimen is equivalent to front-loaded alteplase in terms of the rates of TIMI grade 3 flow, and TIMI 2 or 3 flow, but the 30-day mortality and ICH in both groups was so high that the use of tenecteplase is not permitted in China. These negative safety results might be due to the high rate of percutaneous coronary intervention (PCI) and high dose of bolus heparin and suboptimal concomitant medical therapy during hospitalization, so further studies are needed to confirm the safety for tenecteplase in Chinese patients. Copyright © 2008 Elsevier B. V., Amsterdam. All Rights Reserved.
EMBASE keywords	*Acute Heart Infarction; Dt [Drug Therapy]; Adult; Aged; Angiocardiography; Article; Bleeding; Si [Side Effect]; Blood Clot Lysis; Blood Flow; Body Weight; Brain Hemorrhage; Si [Side Effect]; Cardiotoxicity; Si [Side Effect]; China; Chinese; Clinical Trial; Continuous Infusion; Controlled Clinical Trial; Controlled Study; Disease Duration; Disease Severity; Drug Efficacy; Drug Fatality; Si [Side Effect]; Drug Safety; Female; Hospital; Human; Informed Consent; Major Clinical Study; Male; Multicenter Study; Open Study; Optimal Drug Dose; Partial Thromboplastin Time; Randomized Controlled Trial; Single Drug Dose; St Segment Elevation; Statistical Analysis; Statistical Significance; Stroke; Si [Side Effect]; Acetylsalicylic Acid; Cb [Drug Combination]; Acetylsalicylic Acid; Dt [Drug Therapy]; Acetylsalicylic Acid; Po [Oral Drug Administration];

	*Alteplase; Ae [Adverse Drug Reaction]; *Alteplase; Ct [Clinical Trial]; *Alteplase; Cb [Drug Combination]; *Alteplase; Cm [Drug Comparison]; *Alteplase; Dt [Drug Therapy]; Angiotensin Ii Antagonist; Cb [Drug Combination]; Angiotensin Ii Antagonist; Dt [Drug Therapy]; Beta Adrenergic Receptor Blocking Agent; Cb [Drug Combination]; Beta Adrenergic Receptor Blocking Agent; Dt [Drug Therapy]; Clopidogrel; Cb [Drug Combination]; Clopidogrel; Dt [Drug Therapy]; Dipeptidyl Carboxypeptidase Inhibitor; Cb [Drug Combination]; Dipeptidyl Carboxypeptidase Inhibitor; Dt [Drug Therapy]; Fibrinogen Receptor Antagonist; Cb [Drug Combination]; Fibrinogen Receptor Antagonist; Dt [Drug Therapy]; Heparin; Cb [Drug Combination]; Heparin; Cm [Drug Comparison]; Heparin; Do [Drug Dose]; Heparin; Dt [Drug Therapy]; Heparin; Iv [Intravenous Drug Administration]; Hydroxymethylglutaryl Coenzyme a Reductase Inhibitor; Cb [Drug Combination]; Hydroxymethylglutaryl Coenzyme a Reductase Inhibitor; Dt [Drug Therapy]; Low Molecular Weight Heparin; Cb [Drug Combination]; Low Molecular Weight Heparin; Cm [Drug Comparison]; Low Molecular Weight Heparin; Dt [Drug Therapy]; Nitrate; Cb [Drug Combination]; Nitrate; Dt [Drug Therapy]; Nitrate; Iv [Intravenous Drug Administration]; *Tenecteplase; Ae [Adverse Drug Reaction]; *Tenecteplase; Ct [Clinical Trial]; *Tenecteplase; Cb [Drug Combination]; *Tenecteplase; Cm [Drug Comparison]; *Tenecteplase; Do [Drug Dose]; *Tenecteplase; Dt [Drug Therapy]; Ticlopidine; Cb [Drug Combination]; Ticlopidine; Dt [Drug Therapy]
Accession Number	EMBASE 2007545406
Study design	RCT
Publication Type	Journal: Article
ID	CN-00642101
Available Links	Web Links

Cochrane Central Register of Controlled Trials (CENTRAL) 2008 Issue 4
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Title	A comparison of pharmacologic therapy with/without timely coronary intervention vs. primary percutaneous intervention early after ST-elevation myocardial infarction: the WEST (Which Early ST-elevation myocardial infarction Therapy) study.
Comments	Comment in: Eur Heart J. 2006 Jul;27(13):1511-2. PMID: 16762983.
Author(s)	Armstrong PW, WEST Steering Committee

Source	European heart journal
Date of Publication	2006 Jul
Volume	27
Issue	13
Pages	1530-8
Abstract	AIMS: Uncertainty exists as to which reperfusion strategy for ST-elevation myocardial infarction (MI) is optimal. We evaluated whether optimal pharmacologic therapy at the earliest point of care, emphasizing pre-hospital randomization and treatment was non-inferior to expeditious primary percutaneous coronary intervention (PCI). METHODS AND RESULTS: Which Early ST-elevation myocardial infarction Therapy (WEST) was a four-city Canadian, open-label, randomized, feasibility study of 304 STEMI patients (> 4 mm ST-elevation/deviation) within 6 h of symptom onset, emphasizing pre-hospital ambulance treatment and participation of community and tertiary care centres. All received aspirin, subcutaneous enoxaparin (1 mg/kg), and were randomized to one of three groups: (A) tenecteplase (TNK) and usual care, (B) TNK and mandatory invasive study < or = 24 h, including rescue PCI for reperfusion failure, and (C) primary PCI with 300 mg loading dose of clopidogrel. Time from symptom onset to treatment was rapid (to TNK for A = 113 and B = 130 min and for PCI in C = 176 min). The primary outcome, a composite of 30-day death, re-infarction, refractory ischaemia, congestive heart failure, cardiogenic shock, and major ventricular arrhythmia, was 25% (Group A), 24% (Group B), and 23% (Group C), respectively. However, there was a higher frequency of the combination of death and recurrent MI in Group A vs. Group C (13.0 vs. 4.0%, respectively, P-logrank = 0.021), yet no difference between Group B (6.7%, P-logrank = 0.378) and C. CONCLUSION: These data suggest that a contemporary pharmacologic regimen rapidly delivered, coupled with a strategy of regimented rescue and routine coronary intervention within 24 h of initial treatment, may not be different from timely expert PCI.
Medical Subject Headings (MeSH)	Angioplasty, Transluminal, Percutaneous Coronary [*methods]; Antibodies, Monoclonal [therapeutic use]; Aspirin [therapeutic use]; Drug Therapy, Combination; Enoxaparin [therapeutic use]; Feasibility Studies; Fibrinolytic Agents [*therapeutic use]; Immunoglobulin Fab Fragments [therapeutic use]; Myocardial Infarction [drug therapy; *therapy]; Myocardial Reperfusion [methods]; Platelet Aggregation Inhibitors [*therapeutic use]; Thrombolytic Therapy; Ticlopidine [analogs & derivatives; therapeutic use]; Tissue Plasminogen Activator [therapeutic use] MeSH check words Aged; Female; Humans; Male; Middle Aged
Correspondence Address	Canadian VIGOUR Centre, 2-51 Medical Sciences Building, University of Alberta Edmonton, AB, Canada T6G 2H7. paul.armstrong@ualberta.ca
Accession Number	PUBMED 16757491
Cochrane Group	SR-VASC

code	
Publication Type	Comparative Study; Journal Article; Multicenter Study; Randomized Controlled Trial; Research Support, Non-U.S. Gov't
ID	CN-00576149
Available Links	PubMed Other Web Links

There are **31** results for: " ((**acute** in Title, Abstract or Keywords and **myocardial** in Title, Abstract or Keywords and **infarction** in Title, Abstract or Keywords) and (**METALYSE** in Title, Abstract or Keywords or **TENECTEPLASE** in Title, Abstract or Keywords)) in **Cochrane Central Register of Controlled Trials** "

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0[0] **Record Information** **Sort by:** Record Title | Match % | **Year**

1. **Does coronary angioplasty after timely thrombolysis improve microvascular perfusion and left ventricular function after acute myocardial infarction?**
Agati L, Funaro S, Madonna M, Sardella G, Garramone B, Galiuto L
Year: 2007
Record

2. **Efficacy and safety of single-bolus tenecteplase compared with front-loaded alteplase in Chinese patients with acute myocardial infarction.**
Liang F, Hu D, Shi X, Gao M, Wei J, Zhao H, Wang L, Jia S, Wang H, Liu R, Chen Y, Lu Y
Year: 2007
Record New

3. **Primary angioplasty vs. early routine post-fibrinolysis angioplasty for acute myocardial infarction with ST-segment elevation: the GRACIA-2 non-inferiority, randomized, controlled trial.**
Fernández-Avilés F, Alonso JJ, Peña G, Blanco J, Alonso-Briales J, López-Mesa J, Fernández-Vázquez F, Moreu J, Hernández RA, Castro-Beiras A, Gabriel R, Gibson CM, Sánchez PL, GRACIA-2 (Groupo de Análisis de Cardiopatía Isquémica Aguda) Investigators
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4. **Primary versus tenecteplase-facilitated percutaneous coronary intervention in patients with ST-segment elevation acute myocardial infarction (ASSENT-4 PCI): randomised trial.**
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Year: 2006
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5. **Combined angioplasty and pharmacological intervention versus thrombolysis alone in acute myocardial infarction (CAPITAL AMI study).**

Le May MR, Wells GA, Labinaz M, Davies RF, Turek M, Leddy D, Maloney J, McKibbin T, Quinn B, Beanlands RS, Glover C, Marquis JF, O'Brien ER, Williams WL, Higginson LA
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6. **Facilitated percutaneous coronary intervention for acute ST-segment elevation myocardial infarction: results from the prematurely terminated ADdressing the Value of facilitated ANgioplasty after Combination therapy or Eptifibatide monotherapy in acute Myocardial Infarction (ADVANCE MI) trial.**
ADVANCE MI Investigators
Year: 2005
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7. **International multicentre trial protocol to assess the efficacy and safety of tenecteplase during cardiopulmonary resuscitation in patients with out-of-hospital cardiac arrest: the Thrombolysis in Cardiac Arrest (TROICA) Study.**
Spöhr F, Arntz HR, Bluhmki E, Bode C, Carli P, Chamberlain D, Danays T, Poth J, Skamira C, Wenzel V, Böttiger BW
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8. **Management of prehospital thrombolytic therapy in ST-segment elevation acute coronary syndrome (<12 hours)**
Goldstein P, Wiel E
Year: 2005
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9. **Tenecteplase and tirofiban in ST-segment elevation acute myocardial infarction: results of a randomized trial.**
Ohman EM, Van de Werf F, Antman EM, Califf RM, de Lemos JA, Gibson CM, Oliverio RL, Harrelson L, McCabe C, DiBattiste P, Braunwald E, FASTER (TIMI 24) Investigators
Year: 2005
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10. **Thrombolytics in CPR: current advantages in cardiopulmonary resuscitation.**
Spohr F, Bottiger BW
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12. **Association of the timing of ST-segment resolution with TIMI myocardial perfusion grade in acute myocardial infarction.**
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Year: 2004
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13. **Comparison of rapidity of coronary recanalization in men with tenecteplase versus alteplase in acute myocardial infarction.**
Binbrek AS, Rao NS, Neimane D, Hatou E, Abdulali S, Sobel BE
Year: 2004

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14. **Efficacy of tenecteplase in combination with enoxaparin, abciximab, or unfractionated heparin: one-year follow-up results of the Assessment of the Safety of a New Thrombolytic-3 (ASSENT-3) randomized trial in acute myocardial infarction.**
Sinnaeve PR, Alexander JH, Bogaerts K, Belmans A, Wallentin L, Armstrong P, Adgey JA, Tendera M, Diaz R, Soares-Piegas L, Vahanian A, Granger CB, Van De Werf FJ
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Roe MT, Green CL, Giugliano RP, Gibson CM, Baran K, Greenberg M, Palmeri ST, Crater S, Trollinger K, Hannan K, Harrington RA, Krucoff MW, INTEGRITI Investigators
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16. **Reperfusion treatment of ST-elevation acute myocardial infarction**
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17. **Combination reperfusion therapy with eptifibatide and reduced-dose tenecteplase for ST-elevation myocardial infarction: results of the integrilin and tenecteplase in acute myocardial infarction (INTEGRITI) Phase II Angiographic Trial.**
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Year: 2003
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18. **Comparative fibrinolytic activity of front-loaded alteplase and the single-bolus mutants tenecteplase and lanoteplase during treatment of acute myocardial infarction.**
Al-Shwafi KA, de Meester A, Pirenne B, Col JJ
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19. **Efficacy and safety of tenecteplase in combination with the low-molecular-weight heparin enoxaparin or unfractionated heparin in the prehospital setting: the Assessment of the Safety and Efficacy of a New Thrombolytic Regimen (ASSENT)-3 PLUS randomized trial in acute myocardial infarction.**
Wallentin L, Goldstein P, Armstrong PW, Granger CB, Adgey AA, Arntz HR, Bogaerts K, Danays T, Lindahl B, Mäkijärvi M, Verheugt F, Van de Werf F
Year: 2003
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21. **Outcome of urgent and elective percutaneous coronary interventions after pharmacologic reperfusion with tenecteplase combined with unfractionated heparin, enoxaparin, or abciximab. see comment**

Dubois CL, Belmans A, Granger CB, Armstrong PW, Wallentin L, Fioretti PM, Lopez-Sendon JL, Verheugt FW, Meyer J, Van de Werf F, Assent I
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22. **Outcome of urgent and elective percutaneous coronary interventions after pharmacologic reperfusion with tenecteplase combined with unfractionated heparin, enoxaparin, or abciximab.**
Dubois CL, Belmans A, Granger CB, Armstrong PW, Wallentin L, Fioretti PM, López-Sendón JL, Verheugt FW, Meyer J, Van de Werf F, ASSENT-3 Investigators
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23. **ST segment resolution in ASSENT 3: insights into the role of three different treatment strategies for acute myocardial infarction.**
Armstrong PW, Wagner G, Goodman SG, Van de Werf F, Granger C, Wallentin L, Fu Y, ASSENT 3 Investigators
Year: 2003
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24. **Absence of paradoxical thrombin activation by fibrin-specific thrombolytics in acute myocardial infarction: comparison of single-bolus tenecteplase and front-loaded alteplase.**
Szabo S, Letsch R, Ehlers R, Walter T, Kazmaier S, Helber U, Hoffmeister HM
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25. **Precordial ST-segment depression in inferior myocardial infarction is associated with slow flow in the non-culprit left anterior descending artery.**
Gibson CM, Chen M, Angeja BG, Murphy SA, Marble SJ, Barron HV, Cannon CP, TIMI Study Group
Year: 2002
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Record Information

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Record Title | Match % | **Year**

26. **Relationship of the TIMI myocardial perfusion grades, flow grades, frame count, and percutaneous coronary intervention to long-term outcomes after thrombolytic administration in acute myocardial infarction.**
Gibson CM, Cannon CP, Murphy SA, Marble SJ, Barron HV, Braunwald E, TIMI Study Group
Year: 2002
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27. **Efficacy and safety of tenecteplase in combination with enoxaparin, abciximab, or unfractionated heparin: the ASSENT-3 randomised trial in acute myocardial infarction.**
Assessment of the Safety and Efficacy of a New Thrombolytic Regimen (ASSENT)-3 Investigators
Year: 2001
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28. **Incidence and predictors of bleeding events after fibrinolytic therapy with fibrin-specific agents: a comparison of TNK-tPA and rt-PA.**
Van de Werf F, Barron HV, Armstrong PW, Granger CB, Berioli S, Barbash G, Pehrsson K, Verheugt FW, Meyer J, Betriu A, Califf RM, Li X, Fox NL,

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29. **Pharmacokinetics and pharmacodynamics of tenecteplase: results from a phase II study in patients with acute myocardial infarction.**
Modi NB, Fox NL, Clow FW, Tanswell P, Cannon CP, Van de Werf F, Braunwald E
Year: 2000
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30. **Single-bolus tenecteplase compared with front-loaded alteplase in acute myocardial infarction: the ASSENT-2 double-blind randomised trial. Assessment of the Safety and Efficacy of a New Thrombolytic I**
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Assessment of the Safety and Efficacy of a New Thrombolytic (ASSENT-2) Investigators, Van De Werf F, Adgey J, Ardissino D, Armstrong PW, Aylward P, Barbash G, Betriu A, Binbrek AS, Califf R, Diaz R, Fanebust R, Fox K, Granger C, Heikkilä J, Husted S, Jansky P, Langer A, Lupi E, Maseri A, Meyer J, Mlczoch J, Mocceti D, Myburgh D, Oto A, Paolasso E, Pehrsson K, Seabra-Gomes R, Soares-Piegas L, Sùgrue D, Tendera M, Topol E, Toutouzas P, Vahanian A, Verheugt F, Wallentin L, White H
Year: 1999
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