



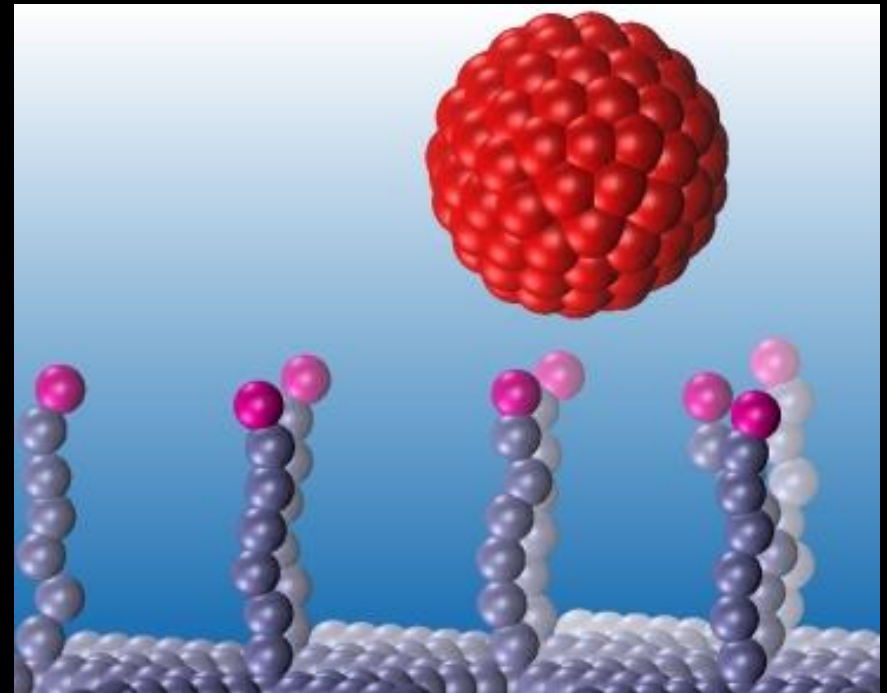
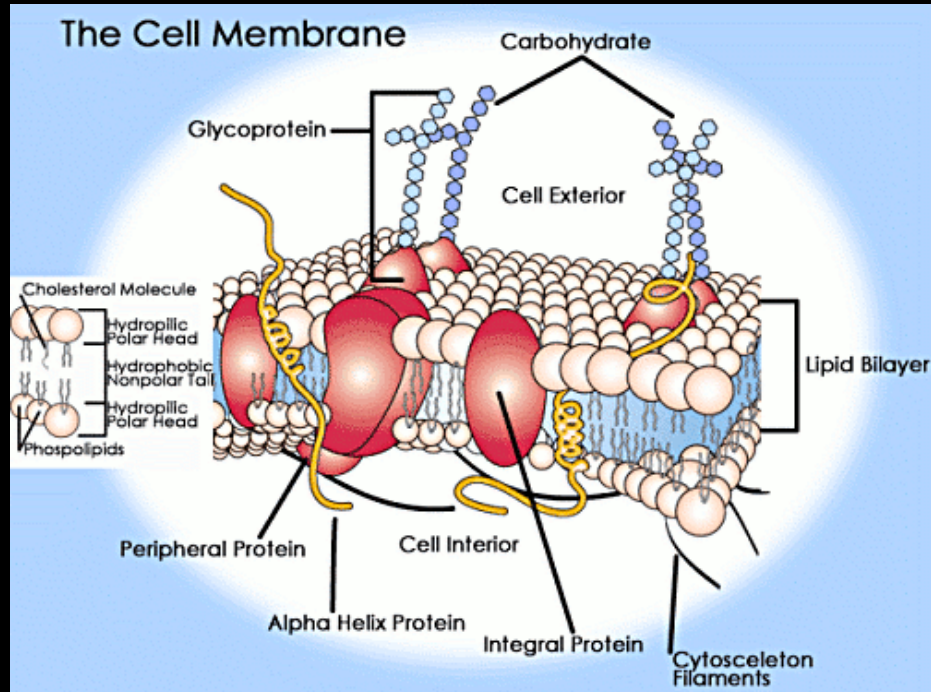
Despir e vestir os vasos

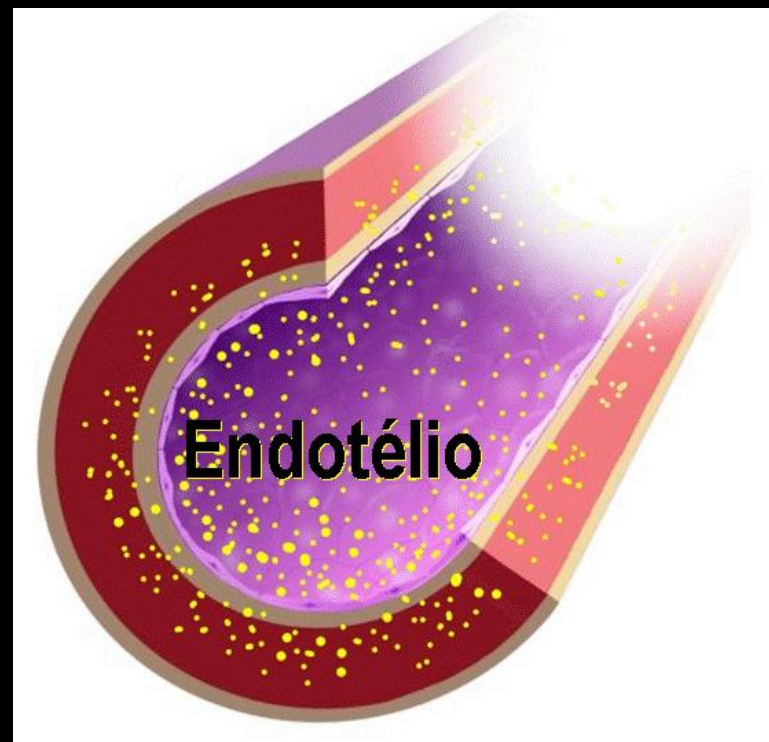
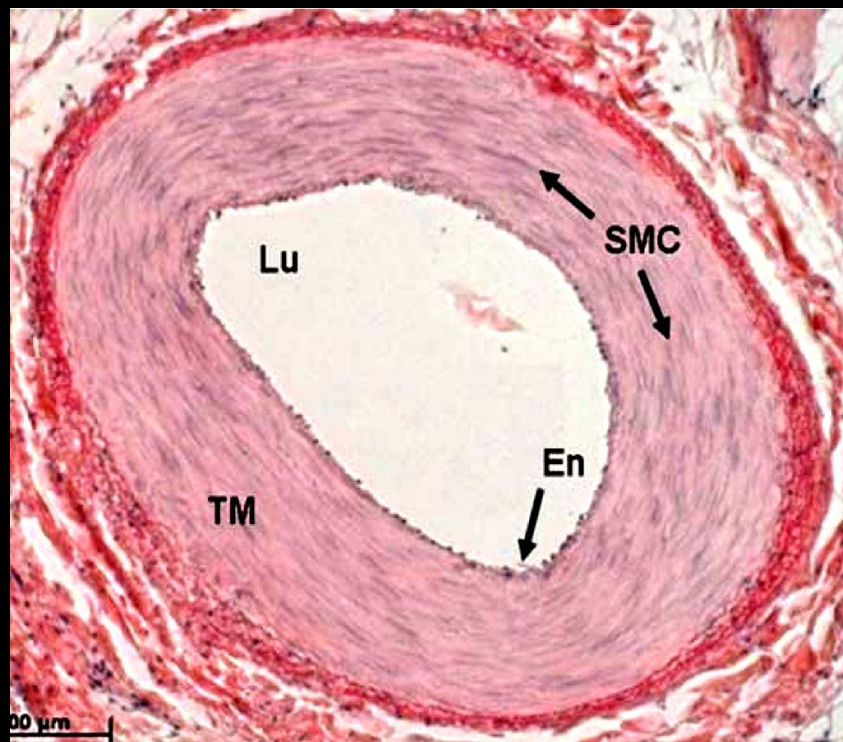
António Pedro Machado

Glicocálice

A wine glass filled with a red liquid, possibly wine, is the central focus. It is illuminated from below with a strong red light, creating a glowing effect on the liquid and the glass. The background is dark, and a large white triangle is superimposed over the image, framing the glass and the text. The text 'Glicocálice' is written in a bold, white, sans-serif font across the middle of the glass.

Glicocálice endotelial





Glycocalyx endothelial

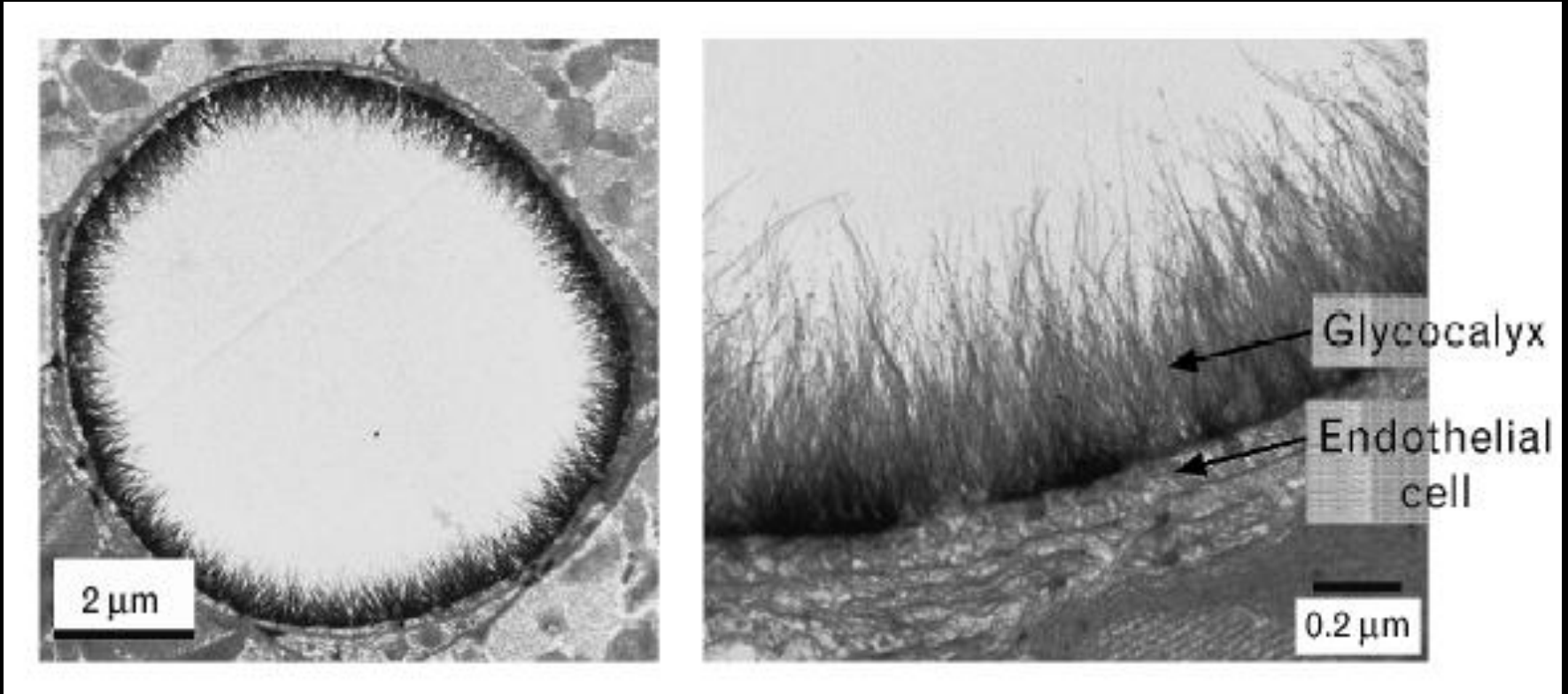
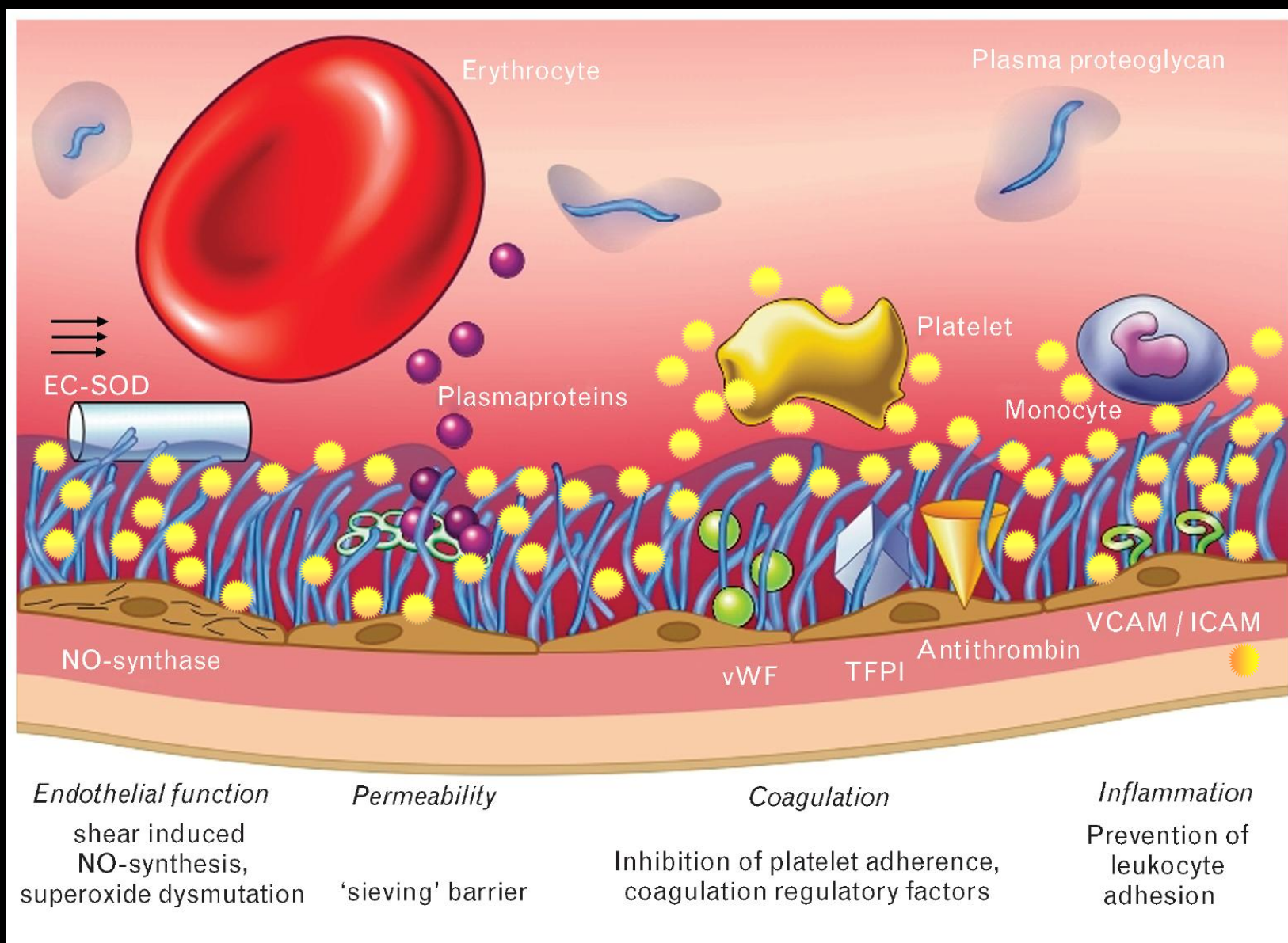
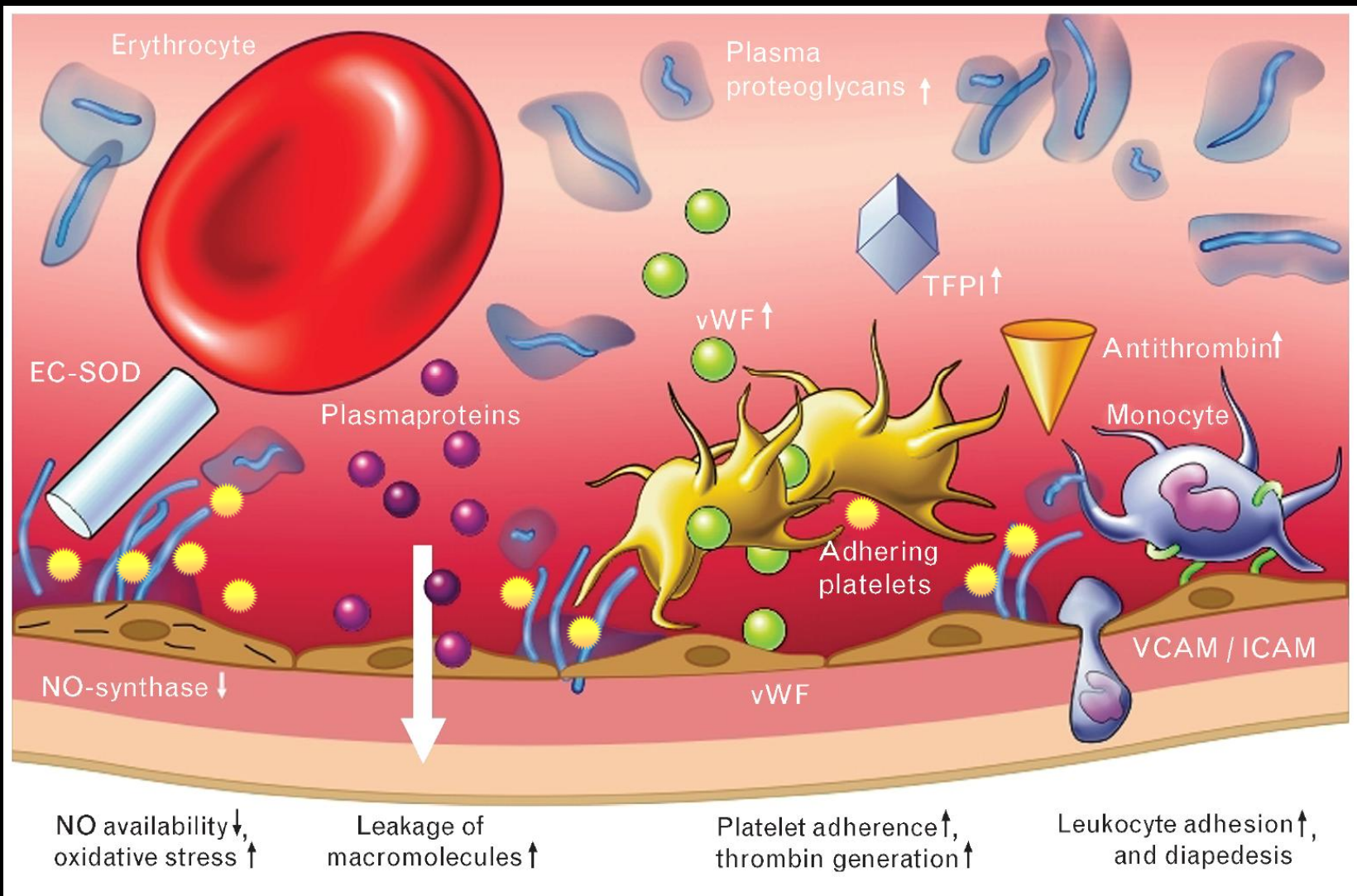


Figure 1. Electron microscopy image of the endothelial glycocalyx in a coronary capillary





Disfunção do glicocálice

A diagram of a blood vessel with a red, textured wall. Inside the vessel, there are several red blood cells, depicted as red, biconcave discs. Two white arrows point downwards from the top text to two different areas within the vessel. The left arrow points to a dark, irregular mass labeled 'Doença venosa'. The right arrow points to a cluster of red blood cells labeled 'Doença aterosclerótica'.

↓
**Doença
venosa**

↓
**Doença
aterosclerótica**

The endothelial glycocalyx: a potential barrier between health and vascular disease

Max Nieuwdorp^a, Marijn C. Meuwese^a, Hans Vink^b, Joost B.L. Hoekstra^c, John J.P. Kastelein^a and Erik S.G. Stroes^a

Purpose of review

Although cardiovascular prevention has improved substantially, we still face the challenge of finding new targets to reduce the sequelae of atherosclerosis further. In this regard, optimizing the vasculoprotective effects of the vessel wall itself warrants intensive research. In particular, the endothelial glycocalyx, consisting of proteoglycans, glycoproteins and adsorbed plasma proteins, may play an essential role in protecting the vessel wall from atherosclerosis.

Recent developments

In this review, we will discuss the different vasculoprotective effects exerted by the endothelial glycocalyx, the factors that damage it, and the first preliminary data on the glycocalyx dimension in humans. Whereas most glycocalyx research has traditionally focused on the microvasculature, more recent data have underscored the importance of the glycocalyx in protecting the macrovasculature against pro-atherogenic insults. It has been shown that glycocalyx loss is accompanied by a wide array of unfavourable changes in both small and larger vessels. Pro-atherogenic stimuli increase the shedding of glycocalyx constituents into the circulation, contributing to the progressive loss of the vasculoprotective properties of the vessel wall. Novel techniques have facilitated reproducible measurements of systemic glycocalyx volume in humans. Consistent with experimental data, the volume of the human glycocalyx is also severely perturbed by exposure to atherogenic risk factors.

Summary

Cumulating evidence suggests that an intact glycocalyx protects the vessel wall, whereas disruption of the glycocalyx upon atherogenic stimuli increases vascular vulnerability for atherogenesis.

Keywords

atherosclerosis, endothelial glycocalyx, hyaluronan, thrombosis

Abbreviations

NO nitric oxide
SOD superoxide dismutase

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0957-9672

Introduction

Cardiovascular disease is the major worldwide cause of mortality. Although a plethora of interventions has attempted to reduce the burden of cardiovascular disease, current strategies aimed at lowering systemic risk factors have only achieved a 20–30% reduction in the cardiovascular event rate [1]. Therefore, novel strategies to improve cardiovascular outcomes are overdue.

Attention has recently shifted from treating systemic risk factors, such as hypercholesterolemia and hypertension, towards increasing the vasculoprotective properties of the vessel wall itself. As the endothelium constitutes the first-line defence against atherosclerosis, research has focused predominantly on strategies to improve endothelial function. Up to now, it has proved to be a major challenge to unravel the components of the anti-atherogenic arsenal of the vessel wall.

In recent years, it has been recognized that the endothelial glycocalyx may contribute to the vasculoprotective effects of the vessel wall. The glycocalyx is a negatively charged, organized mesh of membranous glycoproteins, proteoglycans (e.g. syndecan-1), glycosaminoglycans and associated plasma proteins. Hyaluronic acid and the negatively charged heparan sulphate proteoglycans are its major constituents. The glycocalyx is situated at the luminal side of all blood vessels [2]. The volume of the glycocalyx depends on the balance between biosynthesis and the enzymatic or shear-dependent shedding of its components [3]. Historically, this layer was thought to be confined to a thickness of only several nanometers. More recently, it has been demonstrated to reach up to 0.5–3 μm intraluminally [4]. This dimension of the glycocalyx by far exceeds the size of the endothelium and adhering leukocyte adhesion molecules (Fig. 1) and has triggered researchers to study more closely the role of this layer in atherogenesis [5].

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Current Opinion in Lipidology 2005, 16:507–511

Review

QJM

Hypothesis: arterial glycocalyx dysfunction is the first step in the atherothrombotic process

M.I.M. NOBLE¹, A.J. DRAKE-HOLLAND² and H. VINK³

From the ¹Department of Medicine and Therapeutics, University of Aberdeen Medical School,

²School of Pharmacy and Life Sciences, The Robert Gordon University, Aberdeen, UK, and

³Department of Physiology, Maastricht University, The Netherlands

Summary

We present evidence that the 0.5 µm thick gel layer, lining the inner wall of healthy blood vessels, the glycocalyx, is the first line of defence against atherothrombotic disease. All blood vessel linings are coated with this gel, a highly negatively charged structure, rich in anionic sites mostly represented by the sialic acid moieties of glycoproteins and the sulphate and carboxyl groups of heparan-sulphate proteoglycans. Blood flow in arteries is associated with a shear stress at the glycocalyx, which signals the underlying endothelial cells to release nitric oxide (NO), an anti-atherogenic factor. Sites of low shear stress in the arterial tree are more susceptible to atheroma due to lack of NO generation through this mechanism, whereas exercise, by increasing blood

flow and shear stress, is protective. We postulate that risk factors for atherothrombosis act by impairing glycocalyx function. That luminal hyperglycaemia causes glycocalyx dysfunction has already been shown; we postulate this to be the first step in the atherothrombotic process in patients with diabetes mellitus and metabolic syndrome (insulin resistance). There is also evidence of glycocalyx defects from exposure to oxidized low-density lipoprotein. We postulate that other risk factors will have a similar action on the glycocalyx as the initiating factor in the disease process, e.g. smoking, hyperlipidaemias and hyperhomocystenaemia. These predictions can now be tested in a large animal model of shear-stress-mediated arterial dilatation.

Glycocalyx – O escudo doce dos vasos

Endothelial Glycocalyx: Sweet Shield of Blood Vessels[☆]

Jurgen W. VanTeeffelen*, Judith Brands,
Erik S. Stroes, and Hans Vink

At the time that the term glycocalyx (“sweet husk”) was introduced as a description of the extracellular polysaccharide coating on cells (Bennett HS: 1963. Morphological aspects of extracellular polysaccharides. J Hist Cytochem 11:14-23.), early electron microscopic observations had shown that anionic polysaccharides were also presented by the inner surface of blood vessels but the length of these structures was considered to be small and their functional significance was unknown. Research in the past decades in the glycocalyx field has evolved, and recent estimations indicate that the endothelial glycocalyx constitutes a voluminous intravascular compartment that plays an important role in vascular wall homeostasis. Pathologic loss of glycocalyx may be associated with an impaired vascular wall protection throughout the circulatory system, whereas agonist-induced modulation of glycocalyx accessibility for circulating blood may constitute a physiologically relevant mechanism to regulate functionally perfused volume and exchange area at the microvascular level. Both aspects are discussed in the current review. (Trends Cardiovasc Med 2007;17:101–105) © 2007, Elsevier Inc.



contribute significantly to the volume of the endothelial glycocalyx (Figure 1).

Intravital microscopic studies of the microcirculation in cremaster tissue of rodents indicate that the glycocalyx excludes flowing red blood cells and greatly retards plasma flow under control

A face visível (cosmética) da doença venosa



A face grave da doença venosa

Varizes



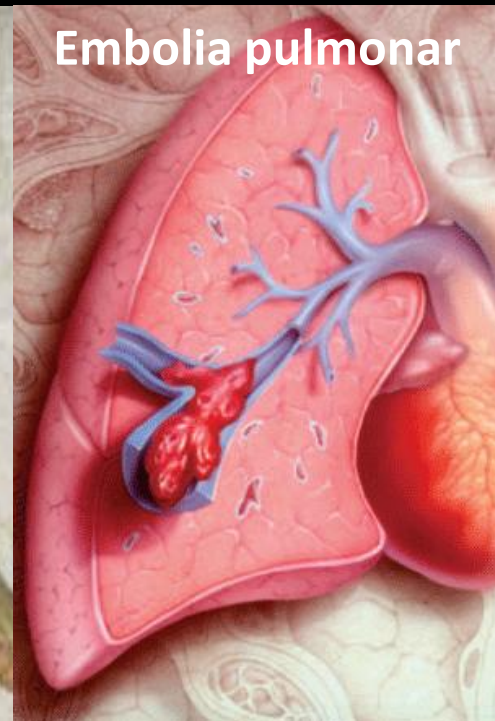
Úlcera de estase



Flebotrombose

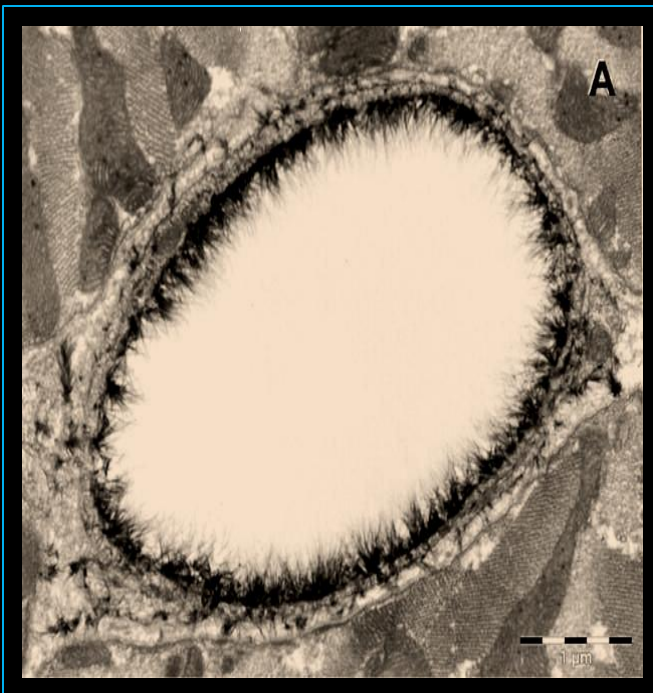


Embolia pulmonar

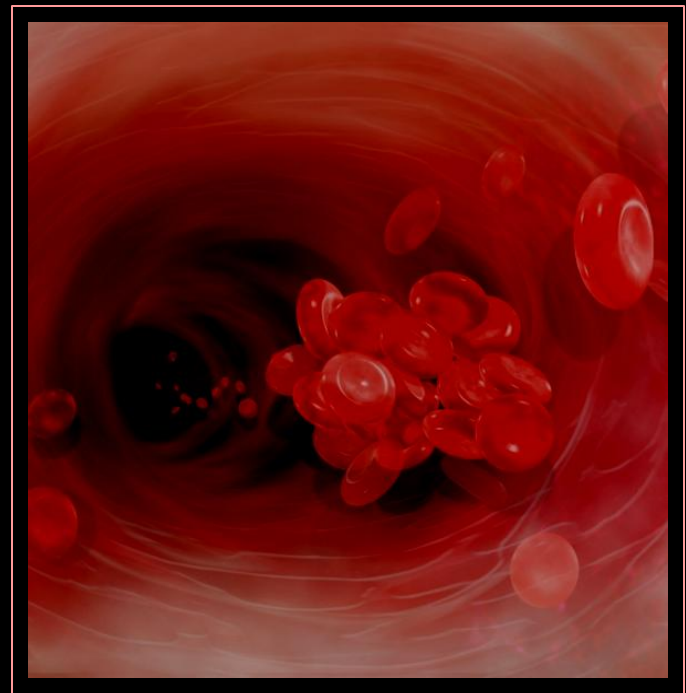


Sulodexida

Recuperação do
Glycocalyx

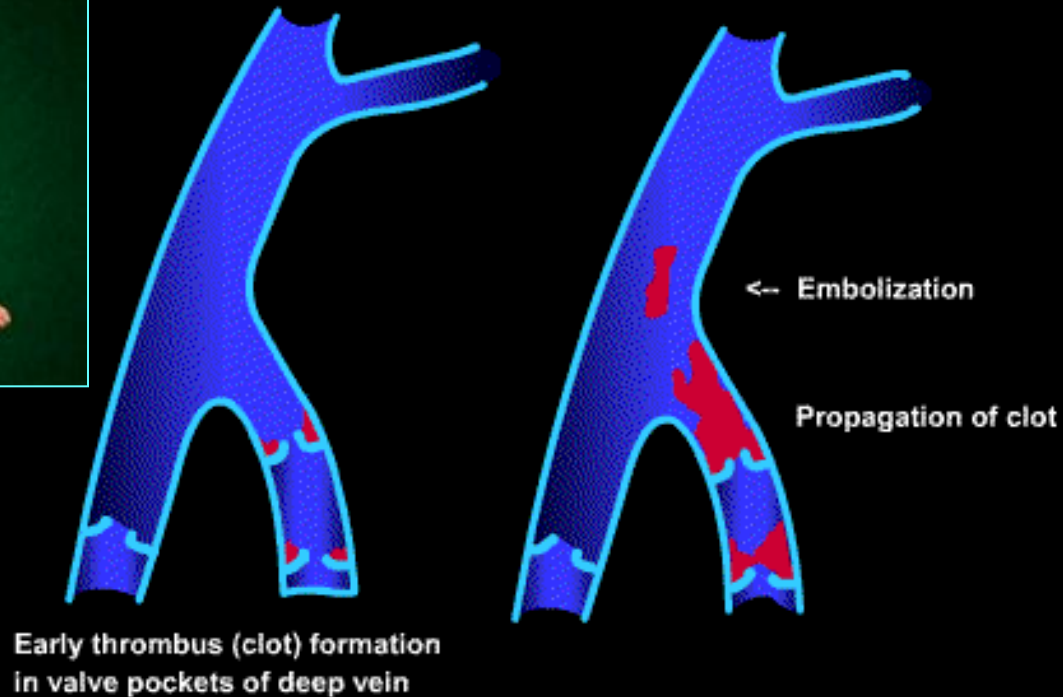


Recuperação da actividade
anticoagulante da parede
vascular

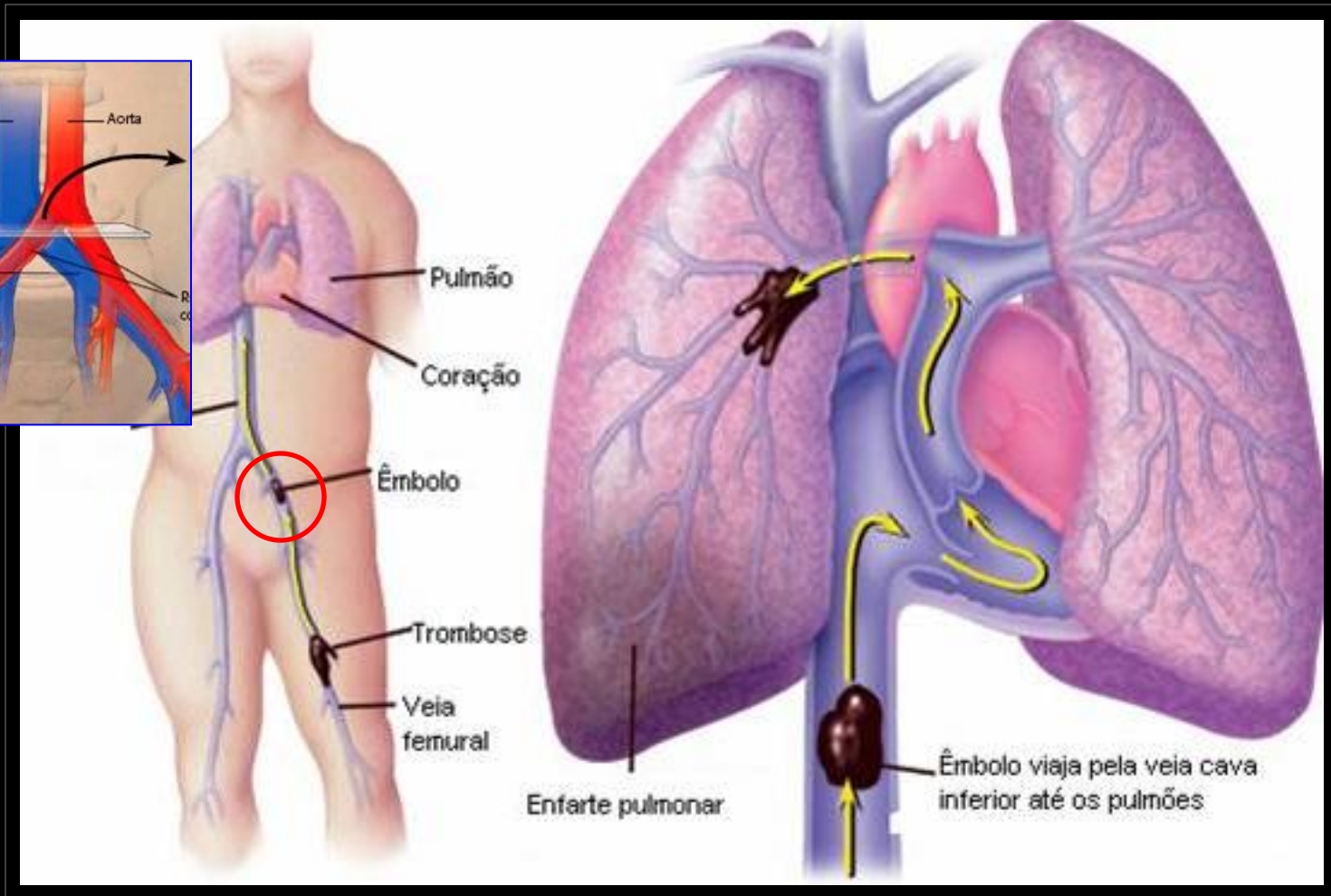
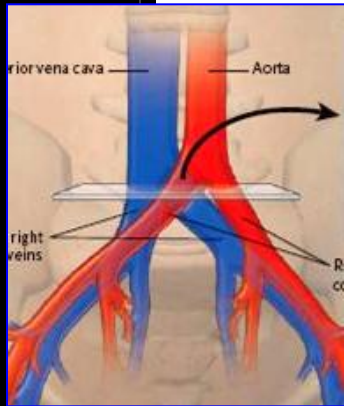


Flebotrombose

Thrombus (clot) Formation & Propagation



Embolia pulmonar

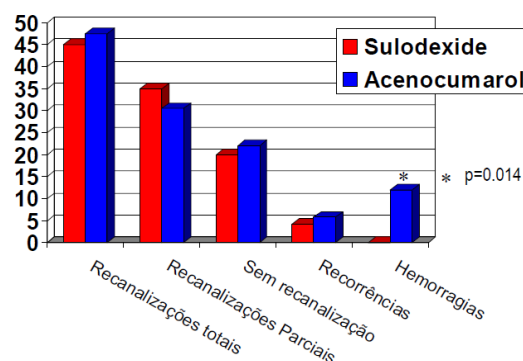


A Study on the Safety, Efficacy, and efficiency Of Sulodexide Compared with Acenocoumarol In Secondary Prophylaxis in Patients with Deep Venous Thrombosis

J Laserra Cirujeda, MD, PhD and P Coronel Granado, MD, B Pharm, Logrono and Madrid, Spain

Titulo	Avaliação da segurança, eficácia e eficiência do Sulodexide em comparação com o acenocoumarol na prevenção secundária em doentes com trombose venosa profunda
Referência	Angiology. 2004; 57:53-64.
Doença	Trombose venosa profunda. Prevenção secundária.
Objectivo	Comparar o efeito do sulodexide com o acenocoumarol na prevenção da trombose venosa recorrente e embolia pulmonar após trombose venosa profunda tratada com HBPM e uroquinase
Desenho	Aleatorizado, aberto, controlado.
Resultados	O sulodexide revelou eficácia semelhante ao acenocoumarol na prevenção secundária após trombose venosa profunda mas, diferentemente do acenocoumarol, não se registaram complicações hemorrágicas.

Comparação do sulodexide com o acenocoumarol na prevenção secundária após TVP



Conclusões:

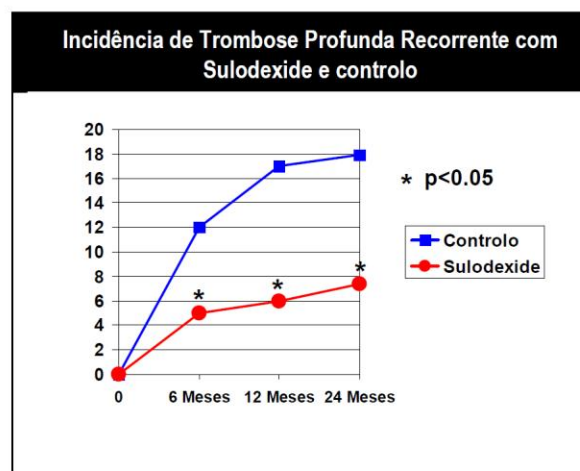
O Sulodexide revelou eficácia semelhante ao acenocoumarol na prevenção da recorrência de trombose venosa profunda ou embolia pulmonar em doentes com TVP proximal dos membros inferiores que foram tratados, na fase aguda, com HBPM e uroquinase.

Os doentes tratados com Sulodexide não tiveram quaisquer complicações hemorrágicas, enquanto que no grupo acenocoumarol houve uma complicação hemorrágica major e nove minor, sendo estas diferenças estatisticamente significativas (p=0.014).

Prevention of Recurrent Deep Venous Thrombosis with Sulodexide: The SanVal Registry

B. M. Errichi, MD, M. R. Cesarone, MD, G. Belcaro, MD, PhD, R. Marinucci, MD, A. Ricci, MD, A. Ippolito, MD, R. Brandolini, MD, G. Vinciguerra, PhD, M. Dugall, MD, A. Felicita, MD, L. Pellegrini, MD, G. Gizzi, MD, M. Ruffini, MD, G. Acerbi, MD, P. Bavera, MD, A. Di Renzo, M. Corsi, MD, M. Scoccianti, MD, M. Hosoi, MD, PhD, M. Lania, MD. *Pescara, Sulmona, Milan, and Pisa, Italy*

Título	Prevenção da trombose venosa profunda recorrente com o Sulodexide. Registo SanVal
Referência	Angiology. 2004;55:143-249
Doença	Trombose venosa profunda
Objectivo	Avaliar o efeito do Sulodexide na prevenção da trombose venosa profunda recorrente em doentes com TVP após 6 meses de tratamento com anticoagulantes orais.
Desenho	Registo de 400 doentes. Grupo de controlo
Resultados	O Sulodexide reduziu significativamente o risco de trombose venosa profunda recorrente ao longo dos 2 anos de tratamento.



Conclusão:

Sulodexide reduz entre 40 e 60% a recorrência de trombose venosa profunda em doentes de alto risco inicialmente tratados com anticoagulantes orais durante 6 meses.

ORIGINAL ARTICLE

A Randomized Trial of Rosuvastatin in the Prevention of Venous Thromboembolism

Robert J. Glynn, Sc.D., Eleanor Danielson, M.I.A., Francisco A.H. Fonseca, M.D., Jacques Genest, M.D., Antonio M. Gotto, Jr., M.D., John J.P. Kastelein, M.D., Wolfgang Koenig, M.D., Peter Libby, M.D., Alberto J. Lorenzatti, M.D., Jean G. MacFadyen, B.A., Børge G. Nordestgaard, M.D., James Shepherd, M.D., James T. Willerson, M.D., and Paul M. Ridker, M.D.

ABSTRACT

BACKGROUND

Controversy persists regarding the extent of shared pathways between arterial and venous thrombosis and whether treatments of known efficacy for one disease process have consistent benefits for the other. Observational studies have yielded variable estimates of the effect of statin therapy on the risk of venous thromboembolism, and evidence from randomized trials is lacking.

METHODS

We randomly assigned 17,802 apparently healthy men and women with both low-density lipoprotein (LDL) cholesterol levels of less than 130 mg per deciliter (3.4 mmol per liter) and high-sensitivity C-reactive protein levels of 2.0 mg per liter or higher to receive rosuvastatin, 20 mg per day, or placebo. We followed participants for the first occurrence of pulmonary embolism or deep-vein thrombosis and performed analyses of the data on an intention-to-treat basis.

RESULTS

During a median follow-up period of 1.9 years (maximum, 5.0), symptomatic venous thromboembolism occurred in 94 participants: 34 in the rosuvastatin group and 60 in the placebo group. The rates of venous thromboembolism were 0.18 and 0.32 event per 100 person-years of follow-up in the rosuvastatin and placebo groups, respectively (hazard ratio with rosuvastatin, 0.57; 95% confidence interval [CI], 0.37 to 0.86; $P=0.007$); the corresponding rates for unprovoked venous thromboembolism (i.e., occurring in the absence of a known malignant condition, trauma, hospitalization, or surgery) were 0.10 and 0.17 (hazard ratio, 0.61; 95% CI, 0.35 to 1.09; $P=0.09$) and for provoked venous thromboembolism (i.e., occurring in patients with cancer or during or shortly after trauma, hospitalization, or surgery), 0.08 and 0.16 (hazard ratio, 0.52; 95% CI, 0.28 to 0.96; $P=0.03$). The rates of pulmonary embolism were 0.09 in the rosuvastatin group and 0.12 in the placebo group (hazard ratio, 0.77; 95% CI, 0.41 to 1.45; $P=0.42$), whereas the rates of deep-vein thrombosis only were 0.09 and 0.20, respectively (hazard ratio, 0.45; 95% CI, 0.25 to 0.79; $P=0.004$). Consistent effects were observed in all the subgroups examined. No significant differences were seen between treatment groups in the rates of bleeding episodes.

CONCLUSIONS

In this trial of apparently healthy persons, rosuvastatin significantly reduced the occurrence of symptomatic venous thromboembolism. (ClinicalTrials.gov number, NCT00239681.)

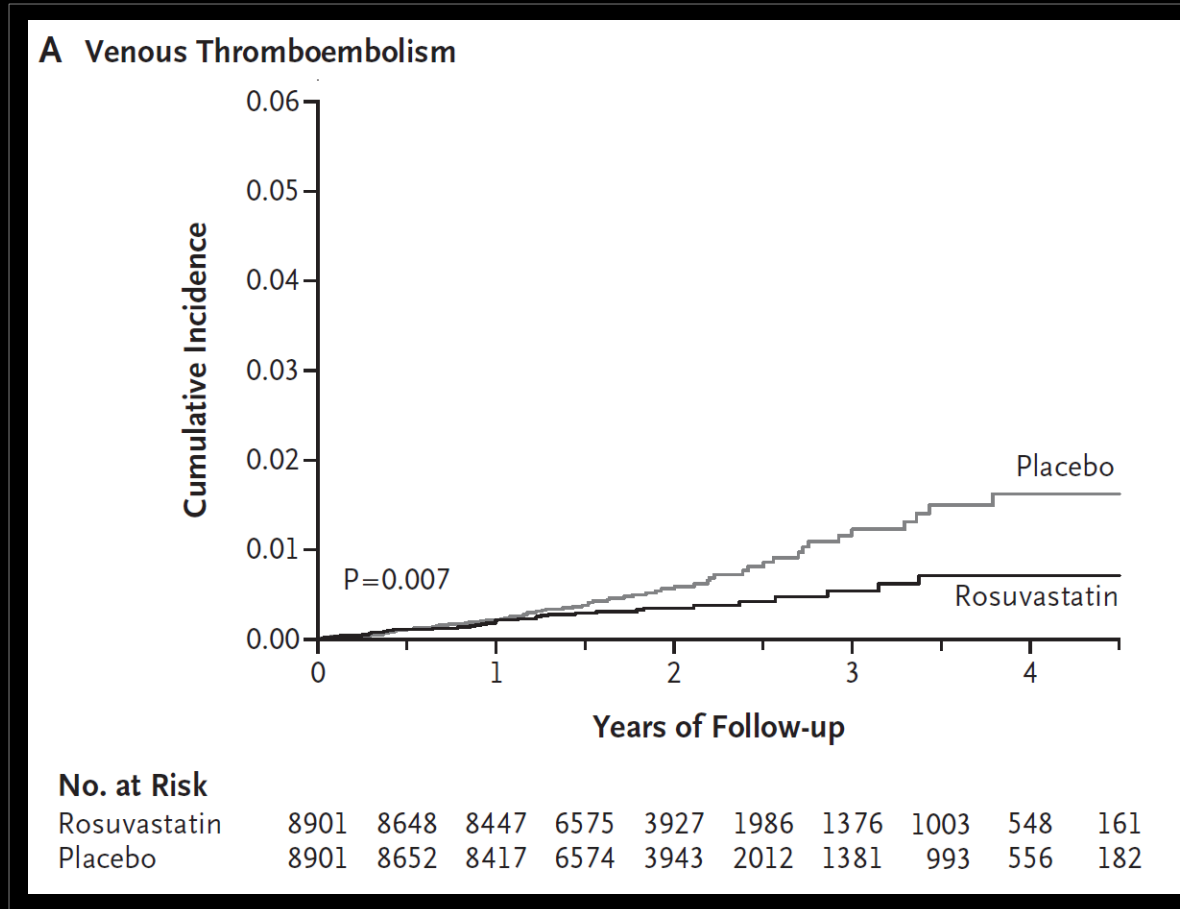
From the Divisions of Preventive Medicine (R.J.G., E.D., J.G.M., P.M.R.) and Cardiovascular Medicine (P.L., P.M.R.), Brigham and Women's Hospital, Harvard Medical School, Boston; Universidade Federal de São Paulo, São Paulo (F.A.H.F.); McGill University Health Center, Montreal (J.G.); Weill Medical College of Cornell University, New York (A.M.G.); Academic Medical Center, University of Amsterdam, Amsterdam (J.J.P.K.); University of Ulm, Ulm, Germany (W.K.); Hospital Cordoba, Cordoba, Argentina (A.J.L.); Herlev Hospital, Copenhagen University Hospital, University of Copenhagen, Herlev, Denmark (B.G.N.); University of Glasgow, Glasgow, Scotland (J.S.); and St. Luke's Episcopal Hospital–Texas Heart Institute, Houston (J.T.W.). Address reprint requests to Dr. Glynn at the Division of Preventive Medicine, Brigham and Women's Hospital, 900 Commonwealth Ave., Boston, MA 02215, or at rglynn@rics.bwh.harvard.edu.

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Prevenção do tromboembolismo venoso com a Rosuvastatina



Partial recovery of the endothelial glycocalyx upon rosuvastatin therapy in patients with heterozygous familial hypercholesterolemia

Marijn C. Meuwese,* Hans L. Mooij,* Max Nieuwdorp,* Bart van Lith,* Roos Marck,* Hans Vink,*[†] John J. P. Kastelein,* and Erik S. G. Stroes^{1,*}

Department of Vascular Medicine,* Academic Medical Center, Amsterdam, The Netherlands; and Department of Physiology,[†] Cardiovascular Research Institute Maastricht, Maastricht University, Maastricht, The Netherlands

Abstract The endothelial glycocalyx has been shown to serve as a protective barrier between the flowing blood and the vessel wall in experimental models. The aim of this study was to evaluate whether hypercholesterolemia is associated with glycocalyx perturbation in humans, and if so, whether statin treatment can restore this. We measured systemic glycocalyx volume (V_G) in 13 patients with heterozygous familial hypercholesterolemia (FH) after cessation of lipid-lowering therapy for a minimum of 4 weeks and 8 weeks after initiating rosuvastatin therapy. Normocholesterolemic subjects were used as controls. V_G was estimated by subtracting the intravascular distribution volume of a glycocalyx permeable tracer (dextran 40) from that of a glycocalyx impermeable tracer (labeled erythrocytes). V_G in untreated FH patients [LDL 225 \pm 57 mg/dl (mean \pm SD)] was significantly reduced compared with controls (LDL 93 \pm 24 mg/dl) (V_G 0.8 \pm 0.3 vs. 1.7 \pm 0.6, respectively, P < 0.001). After normalization of LDL levels (95 \pm 33 mg/dl) upon 8 weeks of statin treatment, V_G recovered only partially (V_G 1.1 \pm 0.4 L, P = 0.04). The endothelial glycocalyx is profoundly reduced in FH patients, which may contribute to increased atherogenic vulnerability. This perturbation is partially restored upon short-term statin therapy.—Meuwese, M. C., H. L. Mooij, M. Nieuwdorp, B. van Lith, R. Marck, H. Vink, J. J. P. Kastelein, and E. S. G. Stroes. Partial recovery of the endothelial glycocalyx upon rosuvastatin therapy in patients with heterozygous familial hypercholesterolemia. *J. Lipid Res.* 2009. 50: 148–153.

Supplementary key words glycosaminoglycans • LDL cholesterol • atherosclerosis

Endothelial cells are shielded from direct exposure to the flowing blood by a highly hydrated mesh of macromol-

ecules, named the endothelial glycocalyx (1). Its major components include proteoglycans with their associated glycosaminoglycans, such as hyaluronan and heparan sulfate, as well as glycoproteins bearing acidic oligosaccharides with terminal sialic acids. Recent intravital microscopic studies showed that the endothelial glycocalyx is 0.5 to 3 μ m thick (2, 3). Several decades ago, Gorog and Born (4) already found that sialic acid density in rabbits was decreased in predilection sites for atherosclerosis. These findings have now been corroborated, because loss of glycocalyx leads to a wide spectrum of vascular abnormalities in experimental models. These comprise increased vascular permeability as well as increased adhesion of leukocytes and thrombocytes to the vessel wall (5–8). Restoration of the glycocalyx is associated with reversal of these proatherogenic changes (5). Collectively, there is growing evidence that the endothelial glycocalyx plays a central role in vascular homeostasis and could be of importance in protecting the vasculature against atherogenic insults.

Recently, our group developed a novel technique to estimate the volume of the endothelial glycocalyx in humans. Using this method, Nieuwdorp et al. (9) showed that acute hyperglycemia results in a profound perturbation of the glycocalyx, coinciding with vascular dysfunction and activation of the coagulation system. Glycocalyx loss was also shown to be present in patients with type 1 diabetes mellitus. Damage was most severe in patients with microalbuminuria (10, 11). In experimental models, other risk factors such as oxygen radical stress, inflammation, and exposure to oxidized low-density lipoprotein (oxLDL) have also been shown to disrupt the glycocalyx (8, 12–14).

In the present study we evaluated whether hypercholesterolemia is associated with glycocalyx perturbation in

This study was funded by a research grant from the Netherlands Heart Foundation to E.S.G. Stroes (2006B088). H. Vink is an established investigator of The Netherlands Heart Foundation (2005T037). J.J.P. Kastelein is a clinical established investigator of the Netherlands Heart Foundation (2000D039). Astra Zeneca provided funding for rosuvastatin.

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Abbreviations: CRP, C-reactive protein; FH, familial hypercholesterolemia; Ht, hematocrit; OPS, orthogonal polarization spectroscopy; oxLDL, oxidized low-density lipoproteins; V_G , systemic glycocalyx volume.

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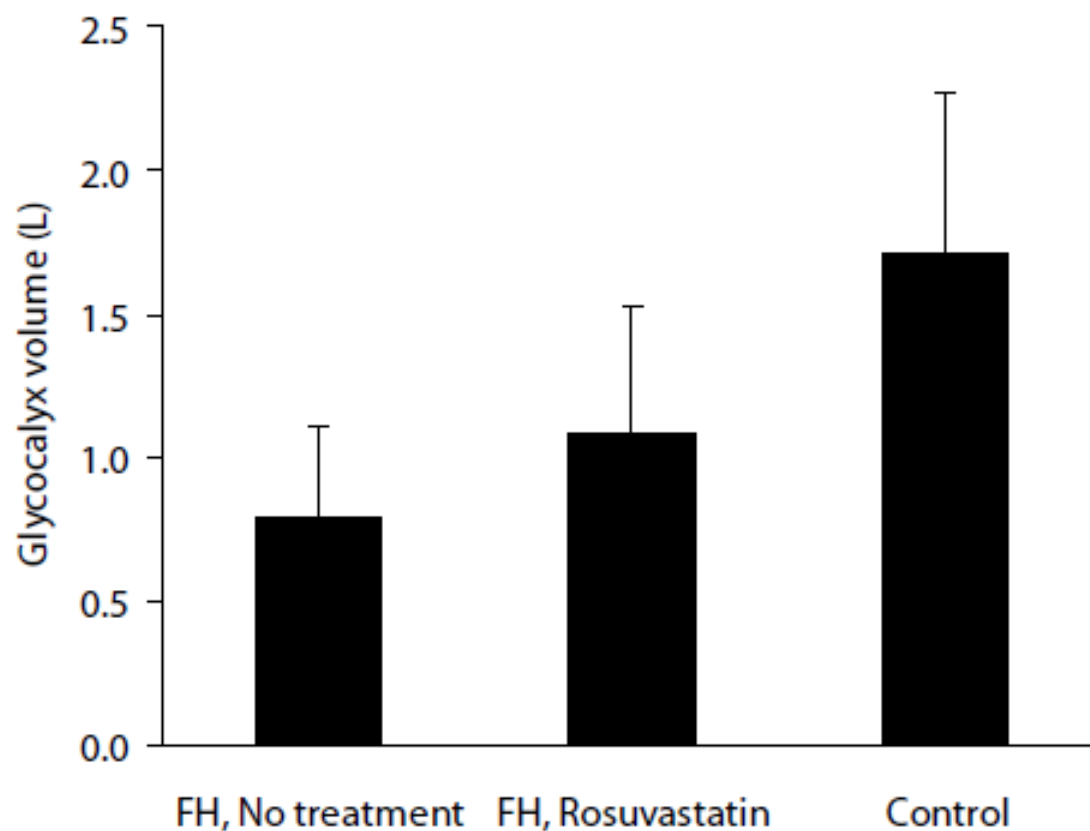


Figure 1. Systemic glyocalyx volume in hypercholesterolemic and normocholesterolemic subjects
VG is significantly reduced in FH patients compared to normocholesterolemic controls. Statin therapy partially restored glyocalyx volume. Mean \pm SD (* $p < 0.05$ FH, rosuvastatin vs. FH, no treatment, # $p < 0.05$ FH, no treatment and FH, rosuvastatin vs. Control).

No tratamento das úlceras venosas



Antithrombotic Therapy for Venous Thromboembolic Disease*

American College of Chest Physicians Evidence-Based Clinical Practice Guidelines (8th Edition)

Clive Kearon, MB, PhD; Susan R. Kahn, MD; Giancarlo Agnelli, MD; Samuel Goldhaber, MD, FCCP; Gary E. Raskob, PhD; and Anthony J. Comerota, MD

3.5.2. Micronized Purified Flavonoid Fraction or Sulodexide for the Treatment of Venous Leg Ulcers

Tratamento de Úlcera de Perna com *Sulodexida*

Albufeira 2010

Andrade, N.; Castro, S.; Martins, C.; Palma, R.; Zorrinha, S. – Unidade de Cuidados de Saúde Personalizados de Quarteira

INTRODUÇÃO

As úlceras dos membros inferiores, feridas crônicas, são um problema da maior importância nos países desenvolvidos, sendo que a sua prevalência aumenta com a idade, tendo estas um forte impacto sócio económico¹. Úlcera de perna venosa é uma solução de continuidade presente entre o pé e a perna com duração superior a 6 semanas, tendo várias etiologias, contudo têm presente a hipertensão venosa e alterações cutâneas².

OBJECTIVO

Avaliar a eficácia da *sulodexida* no tratamento de úlcera de perna.

METODOLOGIA

J. A. do sexo masculino, 71 anos, com úlceras de perna na face interna (Fig.1a) e externa (Fig.1b) do membro inferior esquerdo, com evolução recorrente de 24 meses. Utente diabético (medicado com *Glibenclamida*), acompanhado em consulta de hipocoagulação (medicado com *Tarfarina*). Durante 24 meses esteve em processo de tratamento com pouca evolução cicatricial, apresentando avanços e recuos. Avaliado IPTB, cujo valor é 0.99, pelo qual se deduz que a úlcera é de origem venosa, podendo-se aplicar compressão com meia elástica. Iniciou-se a 12/08/2010 tratamento com *Sulodexida* ampolas (via IM) durante seis dias, após o qual continuou tratamento oral com comprimidos (2 ao almoço e 2 ao jantar). Em Setembro efectuou novo tratamento via IM (por agravamento da úlcera da face externa), com duração de 6 dias, retomando posteriormente tratamento via oral.

RESULTADO

A 12/08/2010 iniciou tratamento intra-muscular com *Sulodexida*. Para o tratamento local da úlcera utilizou-se carboximetilcelulose com prata (penso de hidrofibra), espuma de poliuretano sem rebordo (penso absorvente), copolímero spray para protecção da pele perilesional e aplicação de meia elástica (Fig.1).

A 17/08/2010 visualizou-se diminuição do diâmetro da úlcera principal, que se apresentava menos exsudativa. Nas úlceras satélite observava-se uma ponte, com tecido de epiteliação (Fig.2a). Manteve-se tratamento local em associação à *Sulodexida*.

A 25/08/2010 manteve-se redução do diâmetro da úlcera principal, tecido de granulação presente. Nas úlceras satélite era notória a ponte de tecido de epiteliação e clara redução de diâmetro (Fig. 3).

A 06/09/2010 observava-se ruborização dos tecidos perilesão e exsudado seroso em maior quantidade, na úlcera da face externa (Fig. 4b). Iniciou novamente *Sulodexida* IM, durante seis dias suspendendo medicação oral durante esse período. A 17/09/2010 apresentou melhoria com redução do exsudado e rubor (Fig. 5b).

A 06/10/2010, verificou-se a completa cicatrização das úlceras do membro inferior esquerdo.

DISCUSSÃO / CONCLUSÃO

Os prestadores de cuidados envolvidos no tratamento de doentes com úlceras de perna têm a responsabilidade de prestar cuidados com garantia de qualidade, em termos de tempo de cicatrização, satisfação do doente/família e efectividade em termos de custos¹. Ao associarmos o tratamento sistémico (*Sulodexida*) com o tratamento local das úlceras, verificou-se uma cicatrização em 56 dias. Contudo, após o encerramento das úlceras, o utente mantém *Sulodexida* PO e utilização de meia elástica como prevenção.

Referências Bibliográficas:

1- MORISON, M. J. et al. – *ÚLCERAS DE PERNA – Uma abordagem de aprendizagem baseada na resolução de problemas*. Camarate, 2010. Lexicodacta ISBN 978-989-8075-25-3, 570p.

2- Formação AES Algarve, IP – *Programa de Formação Contínua sobre Tratamento de Feridas – Feridas Crónicas e Feridas Agudas*. Modelo 2, Faro, Setembro de 2010.



Fig. 1- Úlceras exsudativas, sem fibrina com tecido de granulação, a 12/08/2010, face interna e externa, respectivamente a) e b);

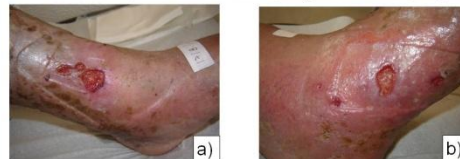


Fig. 2 - A 17/08/2010 apresenta tecido de granulação evidente, ponte de tecido epitelizado nas úlceras satélite e úlcera principal menos exsudativa;



Fig. 3 - Verificou-se diminuição de diâmetro de ambas as úlceras, presença de tecido de granulação e epiteliação (25/08/2010);

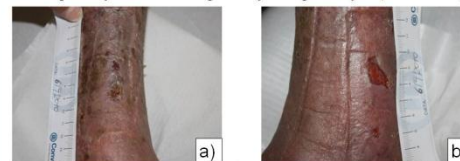


Fig. 4 - A 06/09/2010, rubor na úlcera da face externa, com aumento do exsudado;

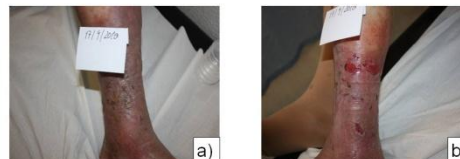


Fig. 5 - A 17/09/2010 úlcera com boa evolução cicatricial após tratamento com *Sulodexida* IM;



Fig. 6 - A 06/10/2010 ferida cicatrizada, com tecido de epiteliação na face interna e externa, respectivamente a) e b);



Fig. 1- Úlceras exsudativas, sem fibrina com tecido de granulação, a 12/08/2010, face interna e externa, respectivamente a) e b);



Fig. 2 -A 17/08/2010 apresenta tecido de granulação evidente, ponte de tecido epitelizado nas úlceras satélite e úlcera principal menos exsudativa;



Fig. 3 -Verificou-se diminuição de diâmetro de ambas as úlceras, presença de tecido de granulação e epitelização (25/08/2010);



Fig. 4 - A 06/09/2010, rubor na úlcera da face externa, com aumento do exsudado;

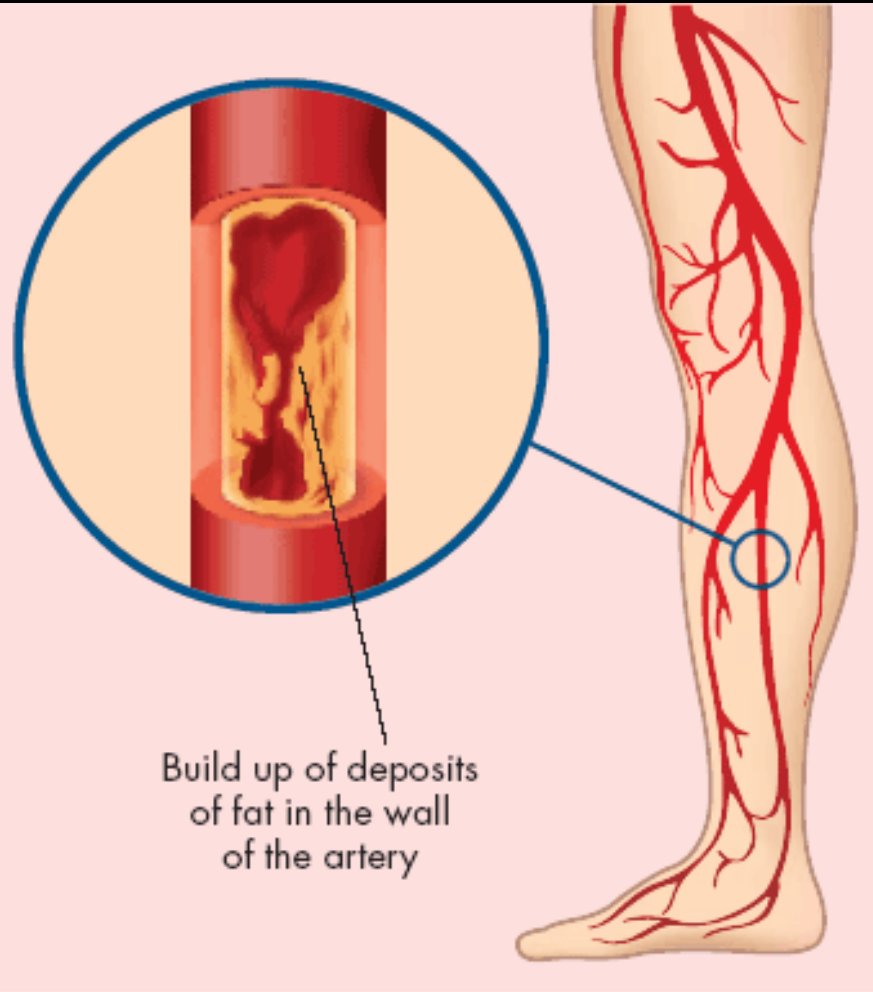


Fig. 5 - A 17/09/2010 úlcera com boa evolução cicatricial após tratamento com *Sulodexida* IM;



Fig. 6 - A 06/10/2010 ferida cicatrizada, com tecido de epitelização na face interna e externa, respectivamente a) e b);

Na claudicação intermitente

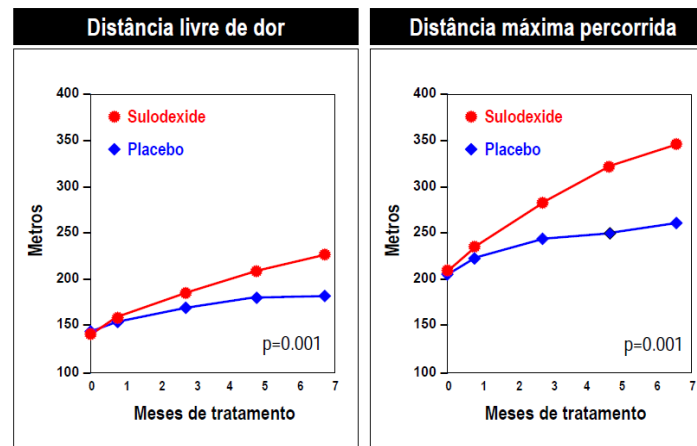


Sulodexide in the treatment of intermittent claudication

Results of a randomized, double-blind, multicentre, placebo-controlled study

S. Coccheri¹, G. Scondotto², G. Agnelli³, E. Palazzini⁴ and V. Zamboni⁴ for the Arterial Arm of the Suavis (Sulodexide Arterial Venous Italian Study) group

Título	Sulodexide no tratamento da claudicação intermitente. Resultados de um estudo aleatorizado, em dupla ocultação, multicentrico e controlado com placebo.
Referência	Eur Heart J. 2002;23:1057-1065
Doença	Claudicação intermitente em diabéticos e não diabéticos
Objectivo	Objectivo primário: duplicação da distancia basal percorrida livre de dor no final do tratamento. Objectivo secundário: duplicação da distância máxima percorrida e do tempo de marcha livre de dor
Desenho	Aleatorizado, com dupla ocultação, multicentrico e controlado com placebo.
Resultados	O tratamento com sulodexide aumentou a capacidade para a marcha em doentes com doença arterial obstrutiva periférica.



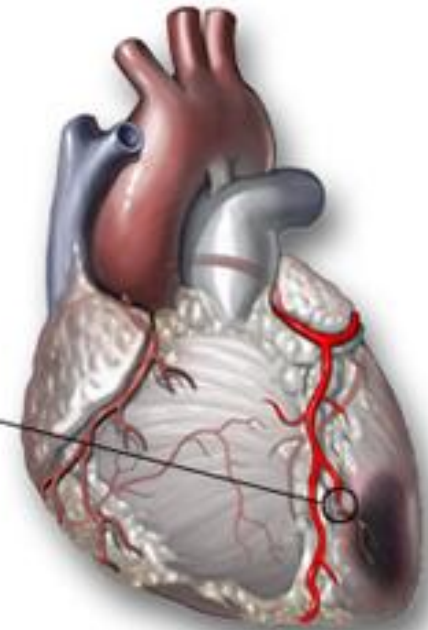
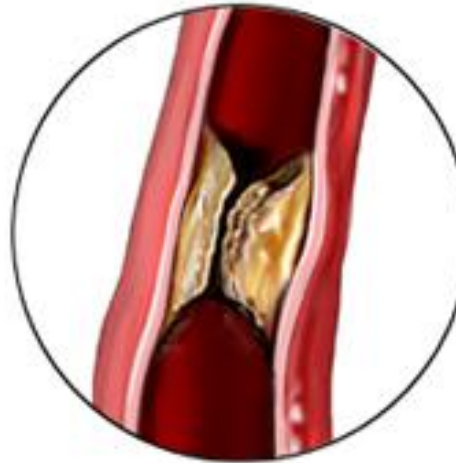
Conclusões:

Após 27 semanas de tratamento com Sulodexide a distância percorrida livre de dor e distância máxima percorrida em treadmill aumentaram, respectivamente, 65% e 76%, contra 30% e 28% no grupo placebo.

Enfarte agudo do miocárdio



Blocked Lumen in Branch
of Left Coronary Artery



Anterior infarct

IPO-V2: A Prospective, Multicenter, Randomized, Comparative Clinical Investigation of the Effects of Sulodexide in Preventing Cardiovascular Accidents in the First Year After Acute Myocardial Infarction

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LUCIANO SCHIVAZAPPA, MD,† GIORGIO MATTIOLI, MD,‡ ANNA VITTORIA MATTIOLI, MD,‡
BRUNO BRUSONI, MD,§ ELISA TROTTA, MD,§ ANGELO BIGNAMINI, PhD||

Naples, Rome, Padua, Modena, Milan and Pavia, Italy

Objectives. This study was conducted to assess the efficacy of sulodexide, a glycosaminoglycan compound with antithrombotic properties, in preventing death and thromboembolic events after acute myocardial infarction.

Background. Antithrombotic therapy has been found to play an important role in the prevention of cardiovascular events and death after acute myocardial infarction. Glycosaminoglycan-containing compounds, including sulodexide, show profibrinolytic and antithrombotic properties that render them suitable for use in patients after infarction.

Methods. A total of 3,986 patients who had recovered from acute myocardial infarction were randomized to receive either the standard therapy routinely administered at each study center, excluding antiplatelet and anticoagulant drugs (control group, 1,970 patients), or the standard therapy plus sulodexide (treated group, 2,016 patients). Between 7 and 10 days after the episode of acute myocardial infarction, sulodexide was administered as a single daily 600-lipoprotein-lipase-releasing unit (LRU) intramuscular injection for the 1st month, followed

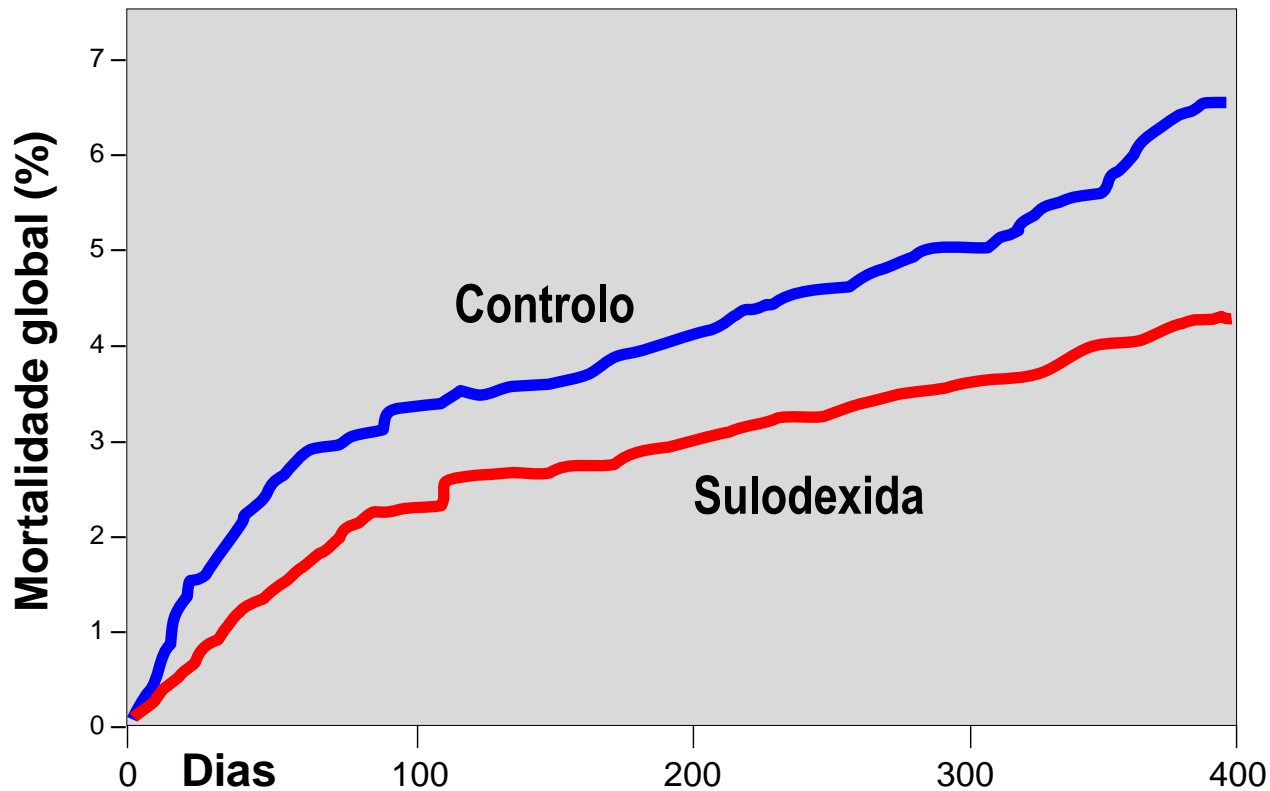
by oral capsules of 500 LRU twice daily. Patients were evaluated for ≥ 12 months.

Results. At the end of the study, 140 deaths (7.1%) were recorded in the control group and 97 (4.8%) in the sulodexide group (32% risk reduction, $p = 0.0022$, chi-square test). A total of 90 patients (4.6%) in the control group had a further infarction, compared with 66 (3.3%) in the sulodexide group (28% risk reduction, $p = 0.035$). Furthermore, a reduction in left ventricular thrombus formation (evaluated by echocardiography) was observed in the sulodexide group ($n = 12$; 0.6%), compared with values in the control group ($n = 25$; 1.3%) (53% risk reduction, $p = 0.027$). Sulodexide was well tolerated and devoid of significant adverse events. All significant results were confirmed by "actual treatment" analyses.

Conclusions. The study provides evidence that long-term therapy with sulodexide started early after an episode of acute myocardial infarction is associated with reductions in total mortality, rate of reinfarction and mural thrombus formation.

(J Am Coll Cardiol 1994;23:27-34)

Redução da mortalidade global com a Sulodexida após EAM



Sulodexida – 97 mortes
Controlo – 140 mortes

A collage of black and white photographs of nude women in various poses, with the text "A doença despe o Médico veste" overlaid in orange. The collage includes a woman in a hat and dark dress in the top left, a woman in a dark dress in the top center, a woman in a dark dress in the top right, a woman in a dark dress in the middle left, a woman in a dark dress in the middle center, a woman in a dark dress in the middle right, a woman in a dark dress in the bottom left, and a woman in a dark dress in the bottom center. The text is centered over the collage.

A doença despe o Médico veste

