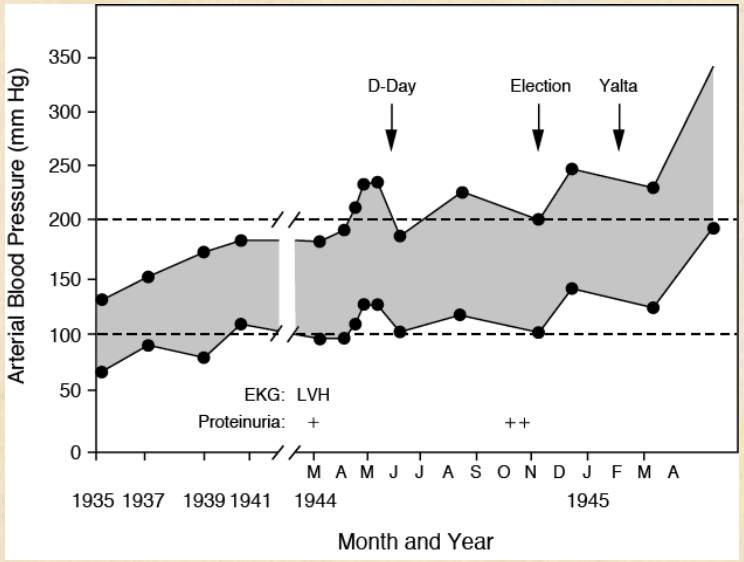
Неотложные состояния при артериальной гипертонии и преэклампсии

Профессор
Е.М. Шифман

Гипертензия беременных



The NEW ENGLAND JOURNAL of MEDICINE

OCCASIONAL NOTES

THIS DAY 50 YEARS AGO

THE headlines of April 13, 1945, stunned the nation and the world. Franklin D. Roosevelt, 32nd president of the United States, had died in Warm Springs, Georgia, the day before. Presumably, he had been in excellent health, there was no indication of imminent danger, and as Admiral Ross McIntire, the president's personal physician, asserted, the cerebral hemorrhage "came out of the clear sky" (Fig. 1).[1] Steve Early, press secretary for the White House, stated officially that "the President was given a thorough examination by seven or eight physicians, including some of the most eminent in the country, and was pronounced organically sound in every way."[1]

However, scrutiny of Roosevelt's history and physical findings (Fig. 2) reveals that these headlines either were a smoke screen or reflected the ignorance of some of the president's attending physicians. As recorded in the personal notes of Dr. Howard G. Bruenn,[2] the cardiologist who cared for Roosevelt during the last year of his life, FDR's blood pressure was 136/78 mm Hg in 1935, 162/98 mm Hg two years later, and 188/105 mm Hg by 1941. By March 1944, target-organ disease was evident — left ventricular hypertrophy on an electrocardiogram, cardiac enlargement on chest film, and proteinuria. Shortly before the invasion of Normandy, FDR's recorded blood pressure reached 226/118 mm Hg (Fig. 2). Throughout the balance of 1944, the president's blood pressure remained high; it was recorded as being over 200/100 mm Hg at the time of his reelection in November 1944. Before the Yalta conference in February 1945, Dr. Bruenn recorded values of 260/150 mm Hg. On the morning of April 12, 1945, while being sketched by Nicholas Robbins, a New York artist, FDR reported a "terrific" occipital headache[3] and lost consciousness immediately afterward. Fifteen minutes later, Dr. Bruenn recorded a blood pressure of more than 300 mm Hg systolic and 190 mm Hg diastolic. The president was pronounced dead at 3:35 p.m.

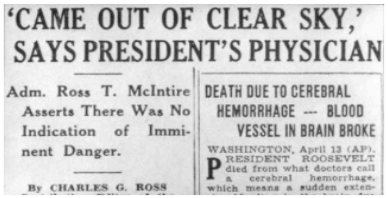
Even from these sparse clinical notes, it is obvious that over a period of only 10 years, FDR had progressively severe hypertension that ultimately entered a malignant phase, leading to a fatal cerebral hemorrhage. During his 1944 radio addresses, short-windedness was occasionally audible, probably reflecting some degree of congestive heart failure. Unfortunately, the president's original chart, which was kept in a safe at the U.S. Naval Hospital in Bethesda, Maryland, vanished immediately after his death, never to be found again. Thus, the only available data are Dr. Bruenn's notes.

In retrospect, it seems unlikely that FDR had essential hypertension. It is unusual for this disorder to appear for the first time at the age of 54 (Roosevelt's age in 1936) and to progress to a malignant phase in less than 10 years. Some form of renovascular disease more readily accounts for this sequence of events or may at least have accelerated the course of essential hypertension. The president was a heavy smoker, and smoking has been identified as a powerful risk factor for renovascular hypertension. Although no autopsy was performed, the embalmers noted that "the arteries were so severely clogged with plaques that the pump [serving to inject formaldehyde] strained and stopped."[4] Indeed, the embalmers had to inject successively the carotids, then the axillaries, and finally the femoral arteries.[4] Thus, there is no doubt that FDR had quite severe and extensive arteriosclerotic disease, and it seems likely that renovascular hypertension, alone or superimposed on essential hypertension, accelerated his death. Because of the severe arteriosclerotic disease, some degree of pseudohypertension may also have contributed to the extremely high blood-pressure values.[5]

The fact that as late as 1945 hypertension was not considered a disease of major clinical consequence should not come as a surprise. It was still viewed by the majority of physicians as "essential" to force blood through sclerotic arteries to the target organs. In fact, Dr. Paul Dudley White noted in his famous 1931 textbook on heart disease,

> The treatment of the hypertension itself is a difficult and almost hopeless task in the present state of our knowledge, and in fact for aught we know . . . the hypertension may be an important compensatory mechanism which should not be tampered with, even were it certain that we could control it.[6]

Given this view, it is possible that some of FDR's physicians may have misjudged the severity of his condition and that the news reports attesting to his good health may not have been merely fabricated for political reasons. Although Dr. Bruenn (a very capable cardiologist) followed FDR closely during the last year of his life, Admiral McIntire (an ear, nose, and throat specialist) relayed all reports to the media. Asked for a "definite statement" on the president's health, McIntire said, "His present health is excellent. I can say that unquali-



'CAME OUT OF CLEAR SKY,' SAYS PRESIDENT'S PHYSICIAN

Adm. Ross T. McIntire Asserts There Was No Indication of Imminent Danger.

By CHARLES G. ROSS

DEATH DUE TO CEREBRAL HEMORRHAGE — BLOOD VESSEL IN BRAIN BROKE

WASHINGTON, April 13 (AP). PRESIDENT ROOSEVELT died from what doctors call a cerebral hemorrhage, which means a sudden exten-

Figure 1. Headlines of the *St. Louis Post-Dispatch*, April 13, 1945.
Reprinted with the permission of the *St. Louis Post-Dispatch*.

Messerli F. H. This day 50 years ago. N Engl J Med. 1995 Apr 13;332(15):1038–1039.

A British Medical Association Lecture

ON

THE SIGNIFICANCE OF A RAISED BLOOD PRESSURE*

BY

JOHN HAY, M.D., F.R.C.P.

PROFESSOR OF MEDICINE, LIVERPOOL UNIVERSITY; SENIOR PHYSICIAN AND PHYSICIAN IN CHARGE OF HEART DEPARTMENT, ROYAL INFIRMARY, LIVERPOOL

My subject is one of very general interest and also of considerable practical importance, if for no other reason than that a large number of our patients at or over middle age present a raised blood pressure. No one can now afford to be indifferent to the problems associated with variations in blood pressure, for a high pressure is an abnormality which always demands investigation, supervision, and careful treatment. There is a danger that patients may take the variations in their blood pressure

The Diastolic Pressure

In Great Britain the diastolic pressure is usually taken as that point at which there is a sudden marked diminution in the intensity of the sounds on auscultation of the brachial artery—normally about 70 to 80 mm. Hg. An increase in diastolic pressure signifies that with each systole a greater expenditure of energy is required to force open the aortic valves. The permanent load on the heart and arteries is greater than normal. The result is an increase in the size and power of the left ventricle, and it is this strain which may be ultimately responsible for the cardiac failure. The end-result of persistent increase in the diastolic pressure is cardiac defeat. The diastolic pressure is increased by any cause which augments peripheral resistance, either vaso-constriction or actual pathological changes in the arterioles, and it is so intimately related to the elasticity of the arterial walls that it is worth while to refer to this in a little more detail.

"Наибольшая опасность для человека с высоким давлением кроется в выявлении последнего, поскольку потом какой-нибудь дурак уверенно попытается и снизит его."

- *Hay, Brit. Med. J. 1931*

Дерзкие кардиологи...

GLIMPSES

A Glimpse at Dr William Evans (1895–1988)

'Willie' Evans was a great teacher. Early in life he realized the importance of teaching in medical education and he drew up a list of requirements of a good lecture that should always be fully prepared. As a result, he was a very popular lecturer.

He visited America in 1954 and, among other places, lectured in Evanston, Illinois, and gave the Garrish Milliken Lecture in Philadelphia. He also lectured in London, Scotland, Ireland, Stockholm, Copenhagen, Brussels, Paris, Rome and Montreal, to name but a few places (Figures 1 and 2). He visited Australia and received the Sydney Gold Medal for work in cardiology in 1954. He told amusing stories of his travels in his 1964 autobiography *Journey to Harley Street*.[1]

He was also a natural research worker and gained pleasure in putting his thoughts on paper. He wrote five books and some 100 scientific publications. Sometimes these were written with a colleague and they covered the whole of cardiology, including electrocardiography, auscultation and cardioscopy. I shall always be grateful to him for starting me on writing professional papers. He showed great courage in opposing the view, generally accepted, that anticoagulants were indicated in cardiac infarction – he called them rat poisons – but he was not always right! He believed that hypertension was harmless, cardiac catheterisation would soon be abandoned and the electrocardiogram was always abnormal with cardiac pain. However, with Clifford Hoyle he was the first to use the controlled trial on the Comparative Value of Drugs used in the

Figure 1 Dr William Evans; last teaching session in the Bearsted Lecture Theatre, The London Hospital, 1973 (reproduced courtesy of The Royal London Hospital Archives)

Figure 2 Dr Williams Evans, last teaching session in the Bearsted Lecture Theatre, The London Hospital, administers Trasitrin to Dr Richard Bomford, 1973 (reproduced courtesy of The Royal London Hospital Archives)

Continuous treatment of Angina Pectoris and he coined the term 'The Placebo Effect'. His publications were collected and annotated in 1990 in a biography entitled *A Rare Hero – Dr William Evans* by Buddug Owen.[2] This includes various quotations of Evans that made his name well known in medical circles: 'No patient should be worse for seeing a doctor'; 'Better Health than Wealth'. He was a religious man but remained a lorer and difficult to get to know. He did not receive any honour – it is possible he refused one, for he certainly deserved one. I think that his writings were so ahead of his time that much of what he said was not accepted by his contemporaries and indeed he was not always right, which made him enemies among his colleagues. He would make statements (and teach) about ideas that were quite new and uncertain. He would say 'if that is wrong I shall soon hear about it'. Although he made it clear that he was not sure about some of these ideas, they were quoted by his juniors and this upset some of his colleagues.

Acknowledgements: I wish to thank Jonathan Evans, Archivist of The Royal London Hospital, Malcolm Towers and Josephine Viney.

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DOI: 10.1258/jmb.2009.009081

References and notes

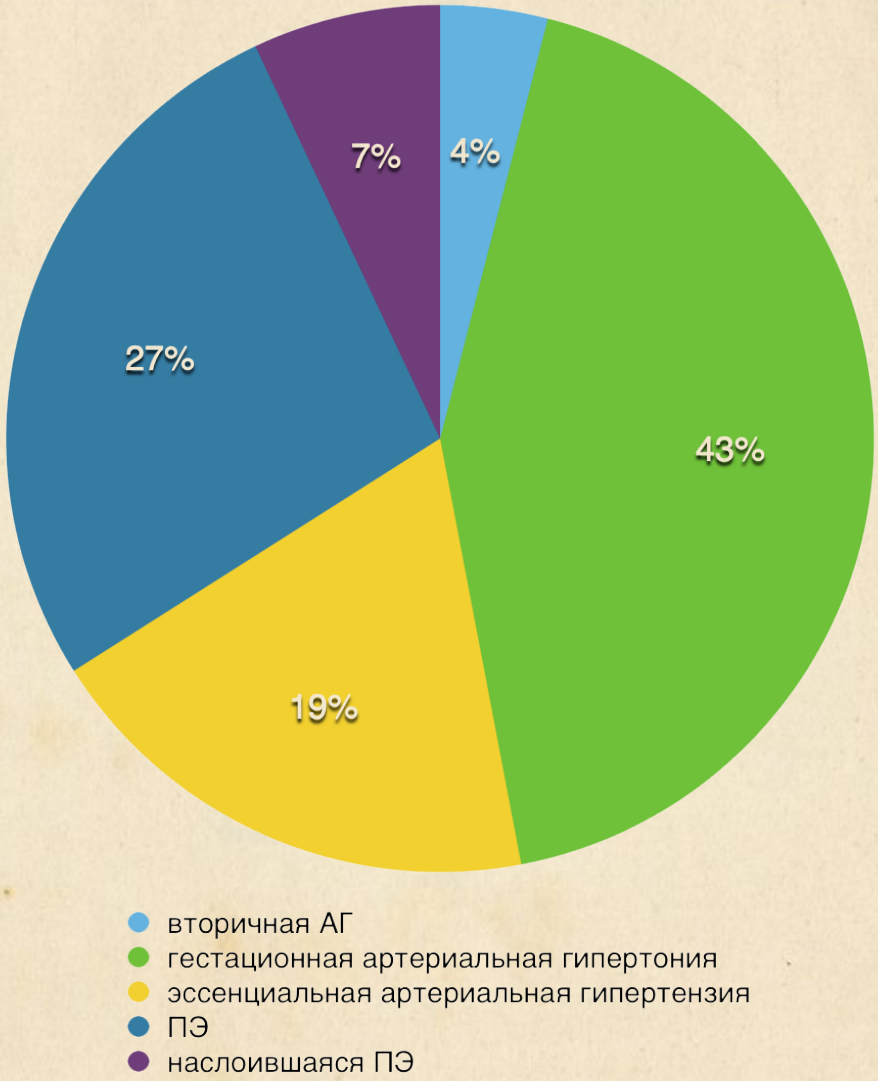
1 Evans W. *Journey to Harley Street*. London: David Rendel Ltd, 1968
2 Owen B. *A Rare Hero – Dr William Evans*. Denbigh: Gee & Sons Ltd, 1999

Уильям Эванс, шеф кардиологии, Лондонский госпиталь, 1940

Письмо другу:

"...я не могу не презирать любого, кто переживает по поводу болезни, которая является плодом воображения. У тебя гипертония (если действительно твое давление эпизодически поднималось до 230/130), что является нормальным физиологическим состоянием, и не трансформировалось в свое время в патологическое состояние артериальной гипертонии. Поэтому, ради Бога, перестань беспокоиться о том, что не должно, но делает тебя несчастным."

Причины артериальной гипертонии во время беременности



Гипертонический криз – терминология и определения

Внезапный подъем АД
ДАД >115–130 мм рт. ст.
Сист.АД > 180–120 мм рт. ст.

Беременность > 169/109
"важен относительный подъем"

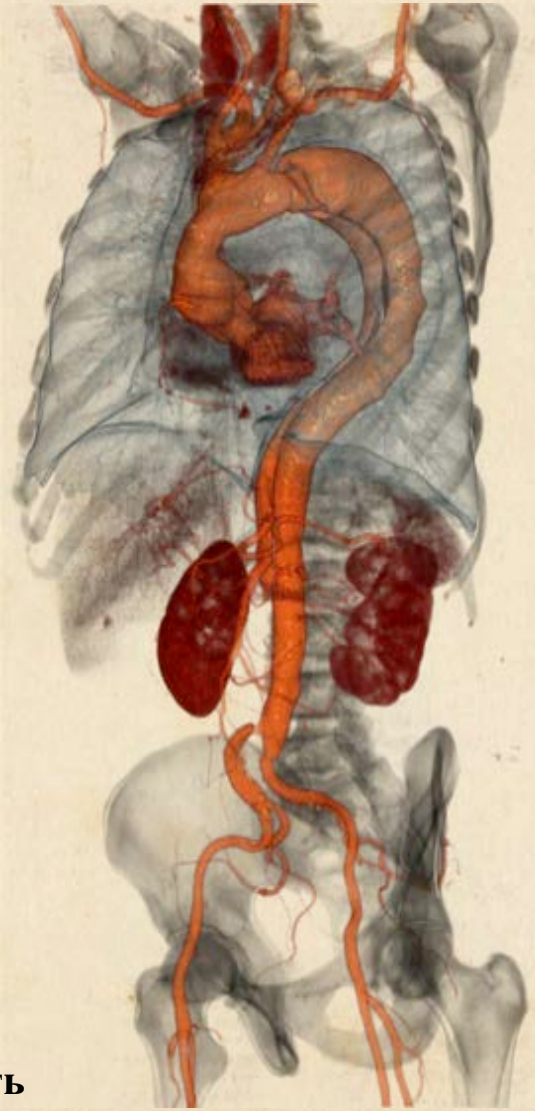
срочное состояние
при артериальной гипертонии:
значимый подъем АД без острого поражения органов
(но с высоким риском такого поражения)

экстренное состояние
при артериальной гипертонии:
острое поражение органов и систем:
ЦНС, почки, сердце.

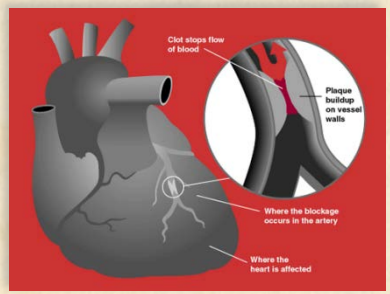
Экстренное гипертоническое состояние

Инсульт
Энцефалопатия

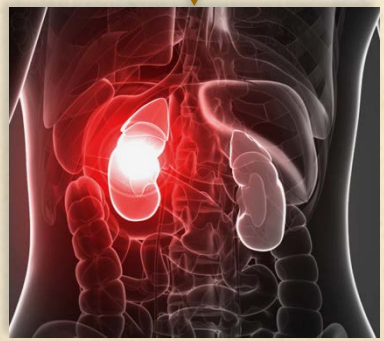
Диссекция аорты



Декомпенсированная сердечная недостаточность



Острый коронарный синдром



Острая почечная недостаточность

Пациентка в ясном сознании?

да ↓ | *нет* ↓

Наличие очаговой неврологической симптоматики

↓ *нет* → *есть* **Это новый симптом?** *да* ↓ | *нет* ↓

Есть отек на глазном дне?

↓ *нет*

Есть на глазном дне геморрагии или экссудаты?

↓ *нет* → *да* **Это новый симптом?** *да* ↓ | *нет* ↓

Есть признаки ишемии на ЭКГ?

↓ *нет* → *да* **Это новый симптом?** *да* ↓ | ↓

Большое количество эритроцитов в моче

↓ *нет*

Креатинин сыворотки повышен? → *да* **Это новый симптом?** *да* ↓ | ↓

↓ *нет*

Это не экстренное гипертоническое состояние

Это новый симптом? *да* ↓ | ↓

Это экстренное гипертоническое состояние

Терапевтическая тактика

- временные рамки – оценить уровень риска
- кривая ауторегуляции сдвинута вправо
- целевое АД
  - ✓ *"срочное"*:
    постепенное снижение ДАД до **90** в течение **24 часов**
  - ✓ *"экстренное"*:
    ДАД **< 110** за **30 – 60 мин.**
  - ✓ *диссекция аорты:*
    от **5** до **10 мин.**
- выбор препаратов: какой идеален?
- направление

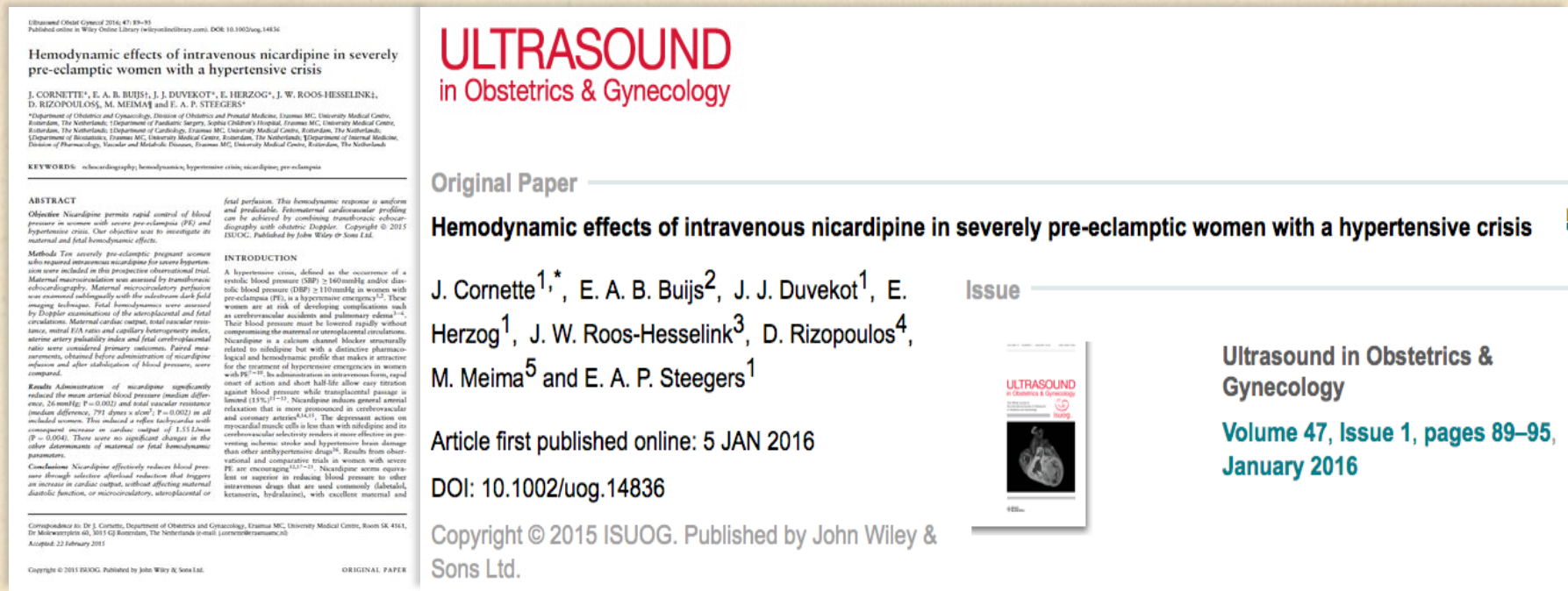
Препарат второй очереди — Нифедипин

- **Нифедипин никогда не следует давать под язык женщине с гипертензией. Нифедипин доступен для приёма внутрь в 3-х видах: капсулы, таблетки в высвобождением действующего вещества в течение 12 часов и в течение 24 часов. Следует внимательно свериться с инструкцией перед назначением препарата.**
- **Капсулы нифедипина (10 мг) "Дозы могут быть повторными, через 4–6 часов по необходимости. Возможно развитие глубокой гипотонии при одновременном назначении нифедипина и парентеральном введении магнезии ==> следует назначать нифедипин с осторожностью.**
- **Формы с постепенным высвобождением действующего вещества (12 часов), например, адалат-ретард, можно рассматривать как средство для длительной поддержки**

MANCHESTER 1824

Central Manchester University Hospitals NHS
NHS Foundation Trust

Для никардипина определен кардиопротективный эффект при отсутствии ухудшения маточно-плацентарного кровотока и состояния плода



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Hemodynamic effects of intravenous nicardipine in severely pre-eclamptic women with a hypertensive crisis

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KEYWORDS: echocardiography; hemodynamics; hypertensive crisis; nicardipine; pre-eclampsia

ABSTRACT

Objective Nicardipine permits rapid control of blood pressure in women with severe pre-eclampsia (PE) and hypertensive crisis. Our objective was to investigate its maternal and fetal hemodynamic effects.

Methods Ten severely pre-eclamptic pregnant women who required intravenous nicardipine for severe hypertension were included in this prospective observational trial. Maternal macrocirculation was assessed by transthoracic echocardiography. Maternal microcirculatory perfusion was examined sublingually with the sidestream dark field imaging technique. Fetal hemodynamics were assessed by Doppler examinations of the uteroplacental and fetal circulations. Maternal cardiac output, total vascular resistance, mitral E/A ratio and capillary heterogeneity index, uterine artery pulsatility index and fetal cerebroplacental ratio were considered primary outcomes. Paired measurements, obtained before administration of nicardipine infusion and after stabilization of blood pressure, were compared.

Results Administration of nicardipine significantly reduced the mean arterial blood pressure (median difference, 26 mmHg; P = 0.002) and total vascular resistance (median difference, 791 dynes × sec^{-1}; P = 0.002) in all included women. This induced a reflex tachycardia with consequent increase in cardiac output of 1.55 L/min (P = 0.004). There were no significant changes in the other determinants of maternal or fetal hemodynamic parameters.

Conclusions Nicardipine effectively reduces blood pressure through selective afterload reduction that triggers an increase in cardiac output, without affecting maternal diastolic function, or microcirculatory, uteroplacental or fetal perfusion. This hemodynamic response is uniform and predictable. Feto-maternal cardiovascular profiling can be achieved by combining transthoracic echocardiography with obstetric Doppler. Copyright © 2015 ISUOG. Published by John Wiley & Sons Ltd.

INTRODUCTION

A hypertensive crisis, defined as the occurrence of a systolic blood pressure (SBP) ≥ 160 mmHg and/or diastolic blood pressure (DBP) ≥ 110 mmHg in women with pre-eclampsia (PE), is a hypertensive emergency[1,2]. These women are at risk of developing complications such as cerebrovascular accidents and pulmonary edema[3–4]. Their blood pressure must be lowered rapidly without compromising the maternal or uteroplacental circulations. Nicardipine is a calcium channel blocker structurally related to nifedipine but with a distinctive pharmacological and hemodynamic profile that makes it attractive for the treatment of hypertensive emergencies in women with PE[7–10]. Its administration in intravenous form, rapid onset of action and short half-life allow easy titration against blood pressure while transplacental passage is limited (15%)[11–13]. Nicardipine induces general arterial relaxation that is more pronounced in cerebrovascular and coronary arteries[8,14,15]. The depressant action on myocardial muscle cells is less than with nifedipine and its cerebrovascular selectivity renders it more effective in preventing ischemic stroke and hypertensive brain damage than other antihypertensive drugs[16]. Results from observational and comparative trials in women with severe PE are encouraging[10,17–23]. Nicardipine seems equivalent or superior in reducing blood pressure to other intravenous drugs that are used commonly (labetalol, ketanserin, hydralazine), with excellent maternal and

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ORIGINAL PAPER

ULTRASOUND in Obstetrics & Gynecology

Original Paper

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Issue

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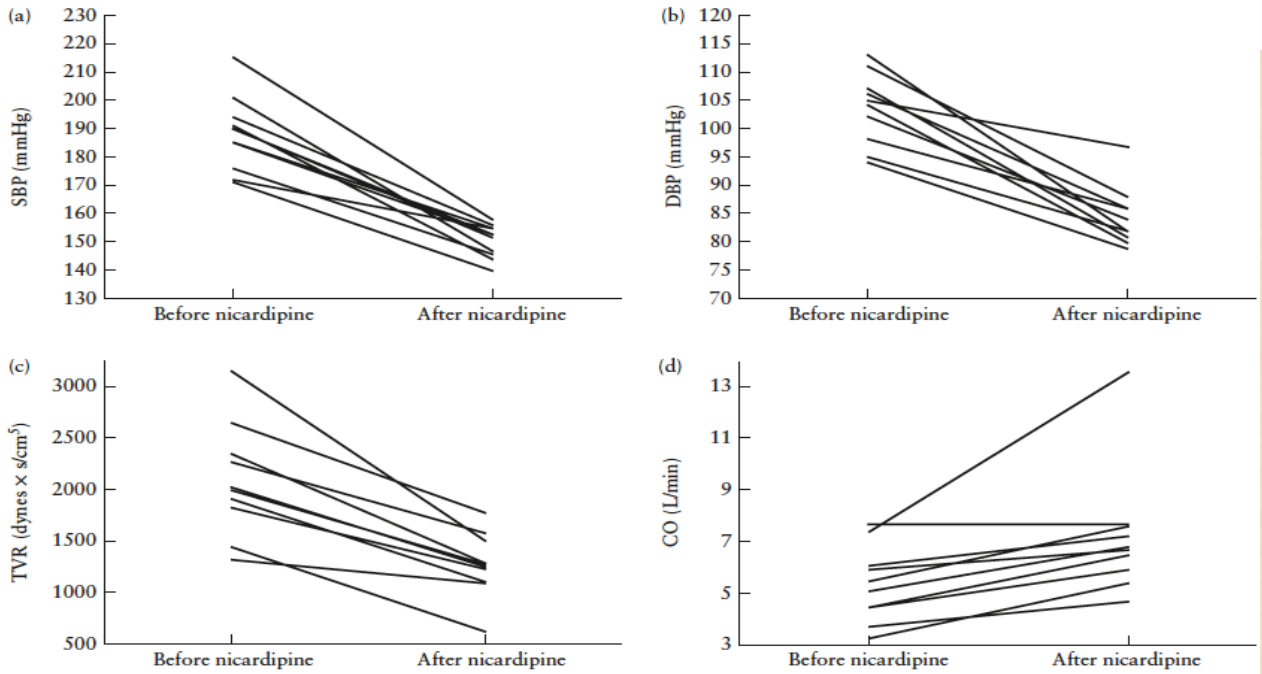

Figure 1 Evolution of: (a) systolic (SBP) and (b) diastolic (DBP) blood pressure, (c) total vascular resistance (TVR) and (d) cardiac output (CO), in 10 pregnant women with pre-eclampsia and hypertensive crisis, before and after stabilization of blood pressure with nicardipine.

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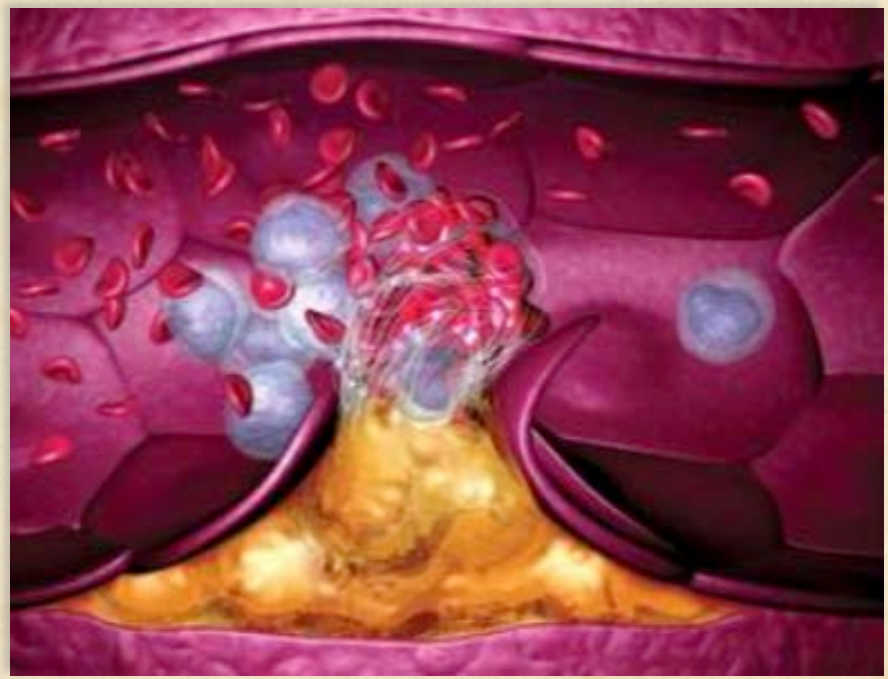
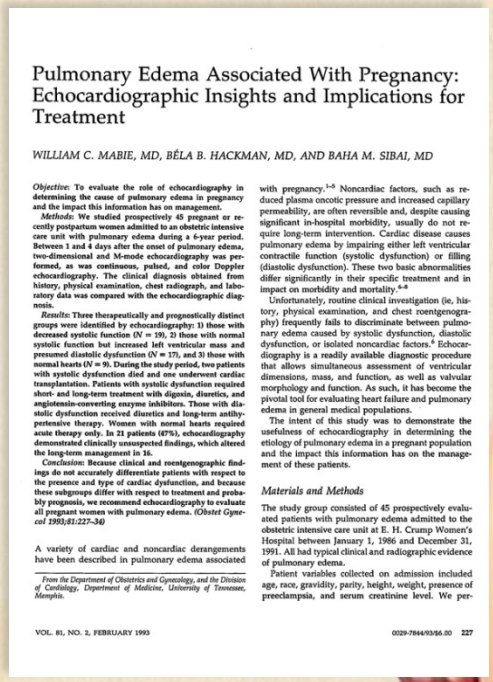
OBSTETRICS & GYNECOLOGY

Женщины с преэклампсией и АГ предрасположены к отеку легких, вследствие развивающихся «синдрома капиллярной утечки» и «дисфункции миокарда»





Pulmonary Edema Associated With Pregnancy: Echocardiographic Insights and Implications for Treatment

WILLIAM C. MABIE, MD, BÉLA B. HACKMAN, MD, AND BAHA M. SIBAI, MD

Objective: To evaluate the role of echocardiography in determining the cause of pulmonary edema in pregnancy and the impact this information has on management.

Methods: We studied prospectively 45 pregnant or recently postpartum women admitted to an obstetric intensive care unit with pulmonary edema during a 6-year period. Between 1 and 4 days after the onset of pulmonary edema, two-dimensional and M-mode echocardiography was performed, as was continuous, pulsed, and color Doppler echocardiography. The clinical diagnosis obtained from history, physical examination, chest radiograph, and laboratory data was compared with the echocardiographic diagnosis.

Results: Three therapeutically and prognostically distinct groups were identified by echocardiography: 1) those with decreased systolic function (N = 19), 2) those with normal systolic function but increased left ventricular mass and presumed diastolic dysfunction (N = 17), and 3) those with normal hearts (N = 9). During the study period, two patients with systolic dysfunction died and one underwent cardiac transplantation. Patients with systolic dysfunction required short- and long-term treatment with digoxin, diuretics, and angiotensin-converting enzyme inhibitors. Those with diastolic dysfunction received diuretics and long-term antihypertensive therapy. Women with normal hearts required acute therapy only. In 21 patients (47%), echocardiography demonstrated clinically unsuspected findings, which altered the long-term management in 16.

Conclusion: Because clinical and roentgenographic findings do not accurately differentiate patients with respect to the presence and type of cardiac dysfunction, and because these subgroups differ with respect to treatment and probably prognosis, we recommend echocardiography to evaluate all pregnant women with pulmonary edema. *(Obstet Gynecol 1993;81:227–34)*

A variety of cardiac and noncardiac derangements have been described in pulmonary edema associated with pregnancy.[1–5] Noncardiac factors, such as reduced plasma oncotic pressure and increased capillary permeability, are often reversible and, despite causing significant in-hospital morbidity, usually do not require long-term intervention. Cardiac disease causes pulmonary edema by impairing either left ventricular contractile function (systolic dysfunction) or filling (diastolic dysfunction). These two basic abnormalities differ significantly in their specific treatment and in impact on morbidity and mortality.[6–8]

Unfortunately, routine clinical investigation (ie, history, physical examination, and chest roentgenography) frequently fails to discriminate between pulmonary edema caused by systolic dysfunction, diastolic dysfunction, or isolated noncardiac factors.[8] Echocardiography is a readily available diagnostic procedure that allows simultaneous assessment of ventricular dimensions, mass, and function, as well as valvular morphology and function. As such, it has become the pivotal tool for evaluating heart failure and pulmonary edema in general medical populations.

The intent of this study was to demonstrate the usefulness of echocardiography in determining the etiology of pulmonary edema in a pregnant population and the impact this information has on the management of these patients.

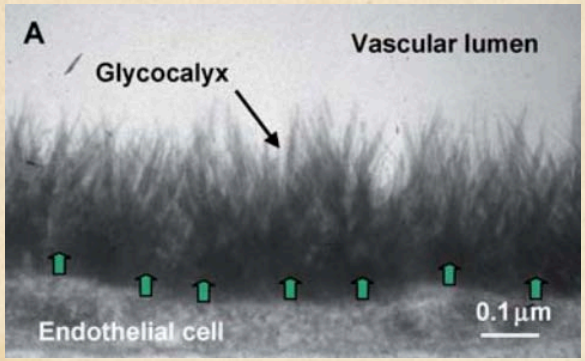
Materials and Methods

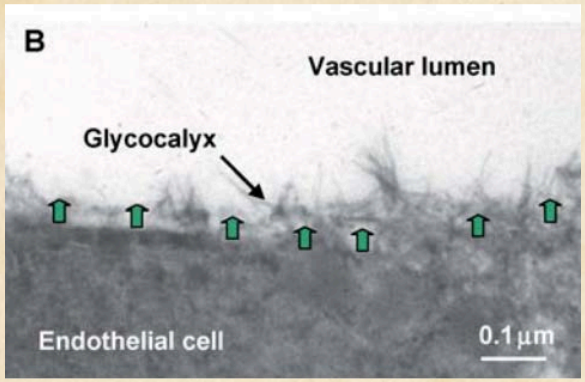
The study group consisted of 45 prospectively evaluated patients with pulmonary edema admitted to the obstetric intensive care unit at E. H. Crump Women's Hospital between January 1, 1986 and December 31, 1991. All had typical clinical and radiographic evidence of pulmonary edema.

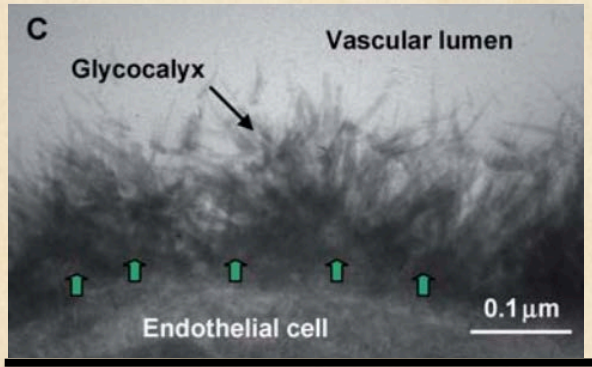
Patient variables collected on admission included age, race, gravidity, parity, height, weight, presence of preeclampsia, and serum creatinine level. We per-

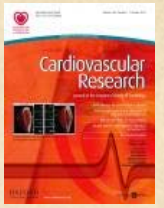
From the Department of Obstetrics and Gynecology, and the Division of Cardiology, Department of Medicine, University of Tennessee, Memphis.

- *Mabie WC, Hackman BB, Sibai BM. Pulmonary edema associated with pregnancy: echocardiographic insights and implications for treatment. Obstet Gynecol 1993; 81: 227–234.*









Cardiovascular Research (2010) **87**, 300–310
doi:10.1093/cvr/cvq137

SPOTLIGHT REVIEW

Therapeutic strategies targeting the endothelial glycocalyx: acute deficits, but great potential†

Bernhard F. Becker[1]*, Daniel Chappell[2], Dirk Bruegger[2], Thorsten Annecke[1,2], and Matthias Jacob[2]

[1]Department of Physiology, Walter-Brendel-Centre of Experimental Medicine, Ludwig-Maximilians-University, Schillerstrasse 44, 80336 Munich, Germany; and [2]Clinic of Anesthesiology, Ludwig-Maximilians-University, Munich, Germany

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Damage of the endothelial glycocalyx, which ranges from 200 to 2000 nm in thickness, decreases vascular barrier function and leads to protein extravasation and tissue oedema, loss of nutritional blood flow, and an increase in platelet and leucocyte adhesion. Thus, its protection or the restoration of an already damaged glycocalyx seems to be a promising therapeutic target both in an acute critical care setting and in the treatment of chronic vascular disease. Drugs that can specifically increase the synthesis of glycocalyx components, refurbish it, or selectively prevent its enzymatic degradation do not seem to be available. Pharmacological blockers of radical production may be useful to diminish the oxygen radical stress on the glycocalyx. Tenable options are the application of hydrocortisone (inhibiting mast-cell degranulation), use of antithrombin III (lowering susceptibility to enzymatic attack), direct inhibition of the cytokine tumour necrosis factor-α, and avoidance of the liberation of natriuretic peptides (as in volume loading and heart surgery). Infusion of human plasma albumin (to maintain mechanical and chemical stability of the endothelial surface layer) seems the easiest treatment to implement.

Keywords Albumin • Hydrocortisone • Ischaemia • Lipopolysaccharide • Permeability

This article is part of the Spotlight Issue on: Microvascular Permeability

1. Introduction

About 70 years ago, the existence of a thin layer of proteinaceous material at the endothelial surface, most likely in vessels, was postulated for the first time in conjunction with the regulation of vascular filtration phenomena.[1] Mainly according to histochemical and then chemical analyses, this layer has since been termed the endothelial glycocalyx, and its primary composition has been quite well characterized. Foremost, one finds core proteoglycans of the syndecan and glypican families carrying highly sulfated, linear glycosaminoglycan attachments (chiefly heparan, chondroitin, and dermatan sulfates), as well as receptor-bound hyaluronan.[2–6] Together, these constituents form a tight and negatively charged meshwork.[7] However, for many decades, any physiological importance of this structure was deemed to be unlikely, partly due to the fact that it is largely destroyed upon conventional tissue fixation and optically transparent in most light microscopic examinations *in vivo* and, thus, at best noticeable only as an 'exclusion' zone for erythrocytes in blood-perfused vessels.[8] Furthermore, an anatomical width of merely some tens of nanometres was suggested in first electron microscopic visualizations relying on traditional fixation modalities.[9] Though the binding of lectins, antibodies, or cationized ferritin demonstrates the presence of surface molecules, this does not suffice to preserve the structure and is, moreover, generally performed after fixation, i.e. after the collapse of the glycocalyx.[10]

A modern technique based on the stabilization of the glycocalyx with lanthanium ions during fixation with glutaraldehyde recently showed this structure at a dimension of 100–750 nm (*Figure 1A* and *B*).[11] This revelation was in line with increasing evidence attributing a considerable physiological role to the apical endothelial glycocalyx, especially in relation to vascular permeability, adhesion of leucocytes and platelets, mediation of shear stress, and modulation of inflammatory processes.[2,12–14] In this regard, one must take into account that the endothelial glycocalyx represents just a basal skeleton, *in vivo* interacting intensely and dynamically with all manner of plasma constituents and, in effect, forming an endothelial surface layer (ESL). This represents the real physiological principle existing at the interface between flowing blood and the vessel wall,[13] and some investigators have reported the ESL to attain a thickness of ≥ 1 µm in certain vessels.[11,13]

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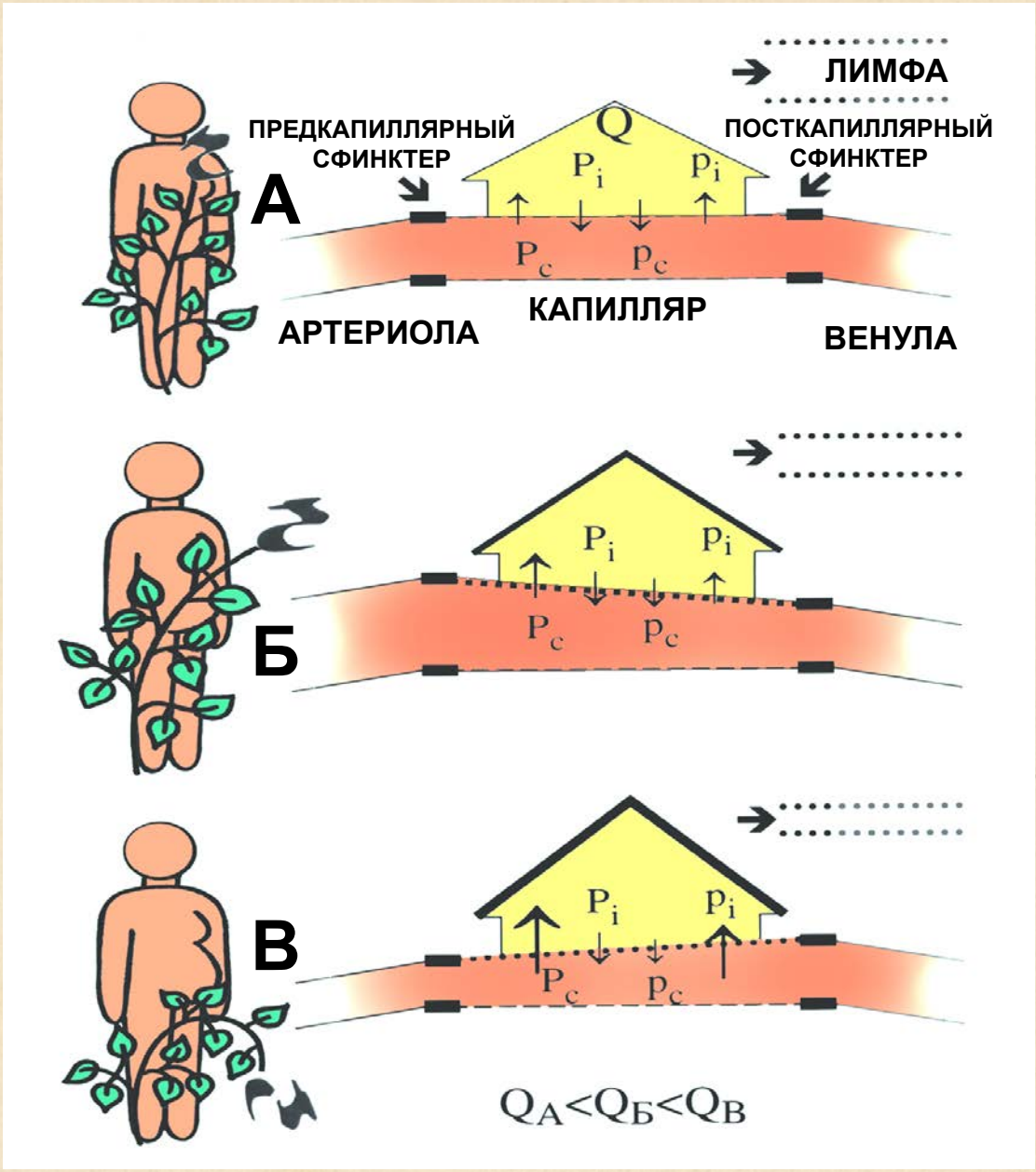
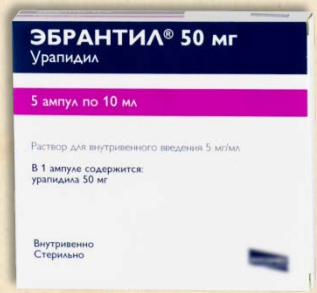
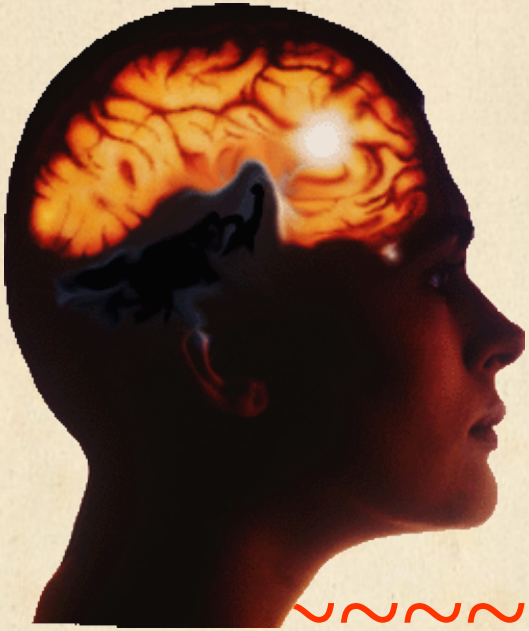
† The work was performed at Walter-Brendel-Centre of Experimental Medicine, Ludwig-Maximilians-University, Munich, Germany.


ЛИМФА
ПРЕДКАПИЛЛЯРНЫЙ СФИНКТЕР
ПОСТКАПИЛЛЯРНЫЙ СФИНКТЕР
Q
Pi
pi
Pc
pc
А
АРТЕРИОЛА
КАПИЛЛЯР
ВЕНУЛА
Б
В
QА<QБ<QВ

В большинстве исследований урапидил сравнивается с дигидралазином, т. к. последний в течение длительного времени (около 40 лет) в Европе был «золотым стандартом» антигипертензивной терапии при преэклампсии



Основная причина эклампсии



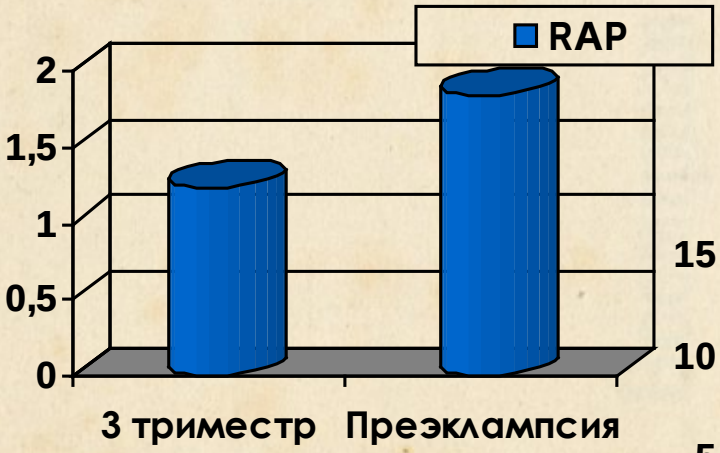
~~~~~ **спазм** ~~~~~

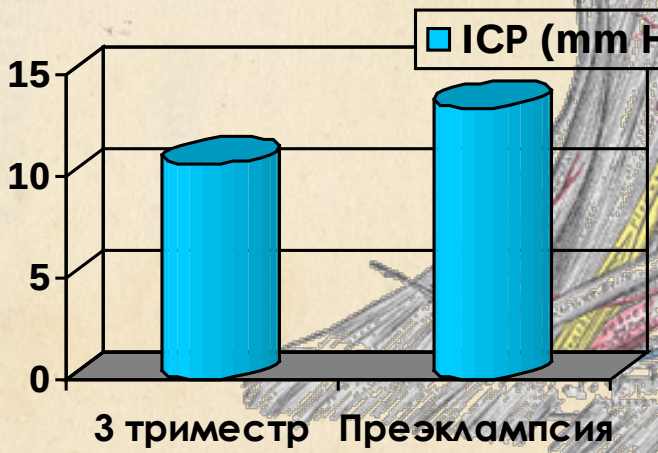
сосудов головного мозга
~~~~~

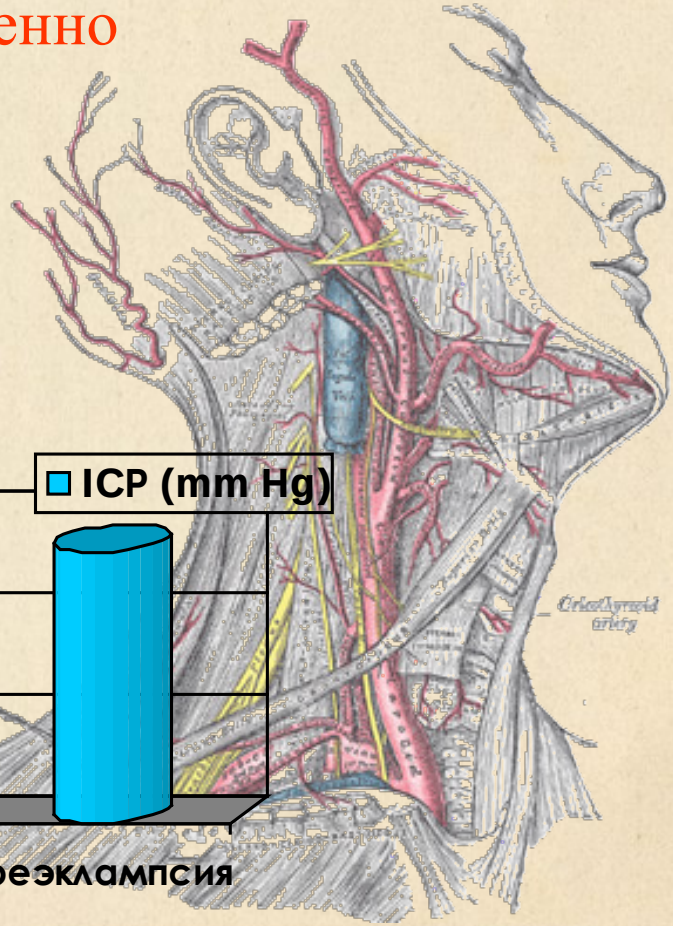
ПМ = САД – ВЧД

Результаты исследования

- уровень гидродинамического сопротивления и внутричерепного давления в группе пациентов с тяжелой преэклампсией существенно выше, чем в группе сравнения







Утверждено в качестве методического руководства для врачей анестезиологов-реаниматологов, акушеров-гинекологов и врачей функциональной диагностики

Ученым советом ГУ НИИ общей реаниматологии РАМН 06.01.2007, протокол № 1;

проблемной комиссией «Гипоксия критических состояний»;

проблемной комиссией «Экстремальные и терминальные состояния»;

Национальным советом по реанимации.

Москва 2007
«Издательство «ИнтелТек»

Кровь

Оксигемоглобин → НН → НО·

Метгемоглобин

ЦН⁻ ЦН⁻ ЦН⁻ ЦН⁻ ЦН⁻

Цианиды

Цианметгемоглобин

ЦН
|
ЦО

Метгемоглобин

ЦО

ЦН⁻

Цитохромоксидаза (ЦО)

Печень

Тиосульфат

ЦН⁻

Роданаза

Тиоцинат

ЦН⁻ Тиоцинатоксидаза

Тиоцинат (кровь)

моча

Наиболее значимые исследования

Nephrol Dial Transplant (1998) 13: 318–325

Nephrology Dialysis Transplantation

Original Article

Treatment of hypertension in patients with pre-eclampsia: a prospective parallel-group study comparing dihydralazine with urapidil

Jürgen Wacker[1], Petra Werner[1], Ingeborg Walter-Sack[2] and Gunther Bastert[1]

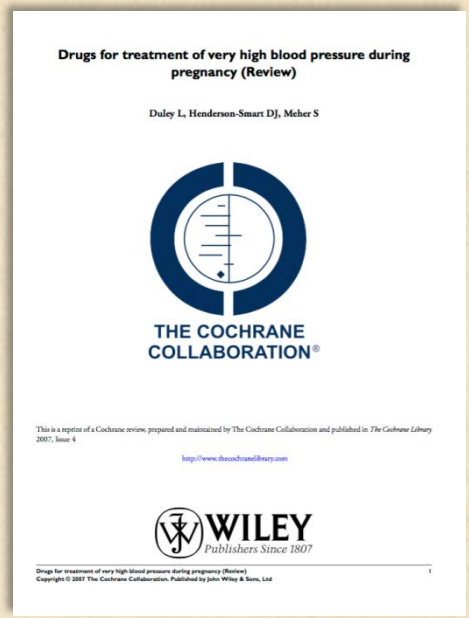
Departments of [1]Obstetrics and Gynecology and [2]Clinical Pharmacology of the University of Heidelberg, Germany

Лечение гипертензии у пациенток с преэклампсией: проспективное в параллельных группах сравнительное исследование дигидралазина и урапидила

Заключение: **поскольку урапидил снижал артериальное давление у пациенток с преэклампсией без серьезных побочных эффектов, урапидил является более предпочтительным, чем дигидралазин. Снижение внутричерепного давления может быть дополнительным положительным эффектом урапидила в лечении пациенток с преэклампсией**

Обзоры и мета-анализы

Drugs for treatment of very high blood pressure during pregnancy (Review)


Drugs for treatment of very high blood pressure during pregnancy (Review)

Duley L, Henderson-Smart DJ, Meher S

THE COCHRANE COLLABORATION®

This is a reprint of a Cochrane review, prepared and maintained by The Cochrane Collaboration and published in *The Cochrane Library* 2007, Issue 4

http://www.thecochranelibrary.com

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Drugs for treatment of very high blood pressure during pregnancy (Review) 1
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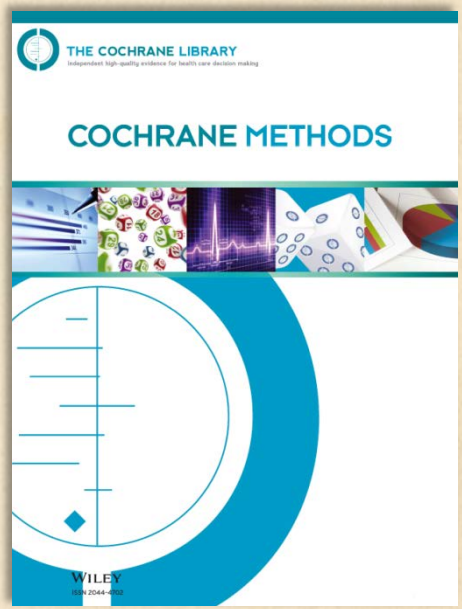
КОХРЕЙНОВСКОЕ СОТРУДНИЧЕСТВО

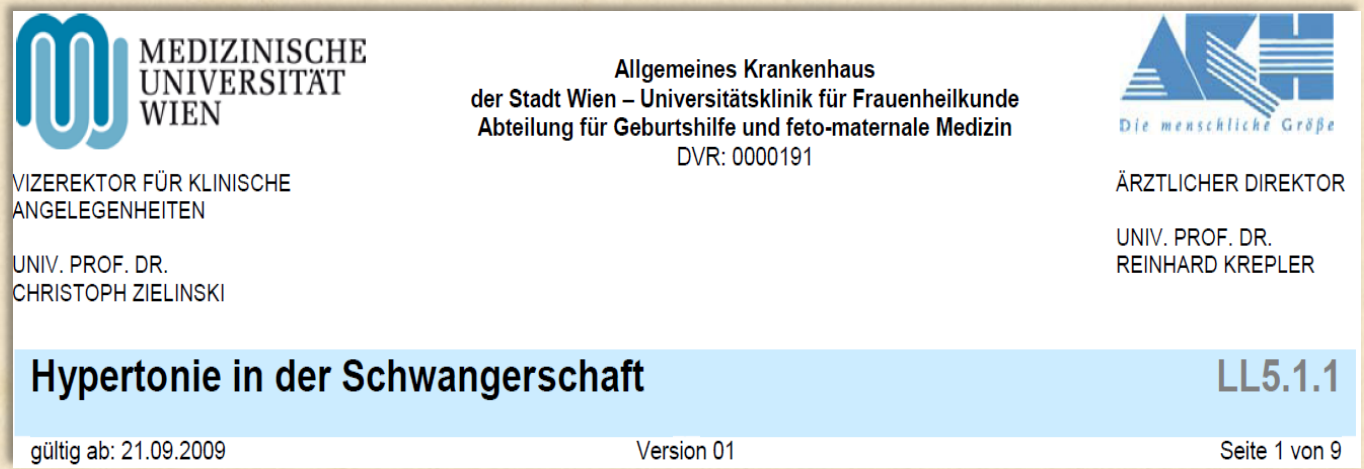
Препараты для лечения очень высокого давления при беременности (обзор)



Урапидил достоверно лучше дигидралазина по следующим конечным точкам:

- **чрезмерная гипотензия,**
- **отслойка плаценты,**
- **младенческая смертность**

Клинический протокол, Австрия



MEDIZINISCHE UNIVERSITÄT WIEN

VIZEREKTOR FÜR KLINISCHE ANGELEGENHEITEN

UNIV. PROF. DR. CHRISTOPH ZIELINSKI

Allgemeines Krankenhaus
der Stadt Wien – Universitätsklinik für Frauenheilkunde
Abteilung für Geburtshilfe und feto-maternale Medizin
DVR: 0000191

Die menschliche Größe

ÄRZTLICHER DIREKTOR

UNIV. PROF. DR. REINHARD KREPLER

Hypertonie in der Schwangerschaft LL5.1.1

gültig ab: 21.09.2009 Version 01 Seite 1 von 9

Гипертония при беременности

Антигипертензивная терапия:

Первая линия – Эбрантил (урапидил):

- Рекомендуемый способ применения: с помощью перфузора 2 ампулы по 50 мг (10 мл) Эбрантила (урапидила HCl) на 30 мл 0,9% раствора NaCl = 50 мл
- Начальная доза: 100 мл/ч в первые 2 мин, + возможно, следующие 2 мин
- Поддерживающая доза: 5–25 мл/ч
- Максимальная доза: 50 мл/ч
- При достижении АД 170/110 мм рт. ст. – переход на пероральные препараты

Пероральные препараты:

- После 20-й недели беременности – Эбрантил по 1 капсуле 30 мг 2 раза в день (максимальная доза – 180 мг/день)

Механизм действия Урапидила

Центральный эффект

Ствол мозга

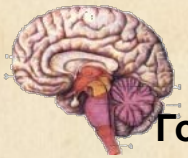
Периферический эффект

Урапидил → Стимуляция центральных рецепторов серотонина → **Серотониновые рецепторы**

Урапидил

Доля работающих серотонинэргичных нейронов

Симпатический ганглий

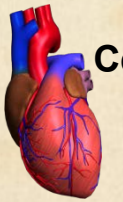


Головной мозг

Не влияет на ВЧД и перфузию мозга

Симпатический тонус

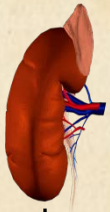
NA



Сердце

Отсутствует рефлекторная тахикардия

NA



Почки

Поддерживается или увеличивается ток крови в почках

NA

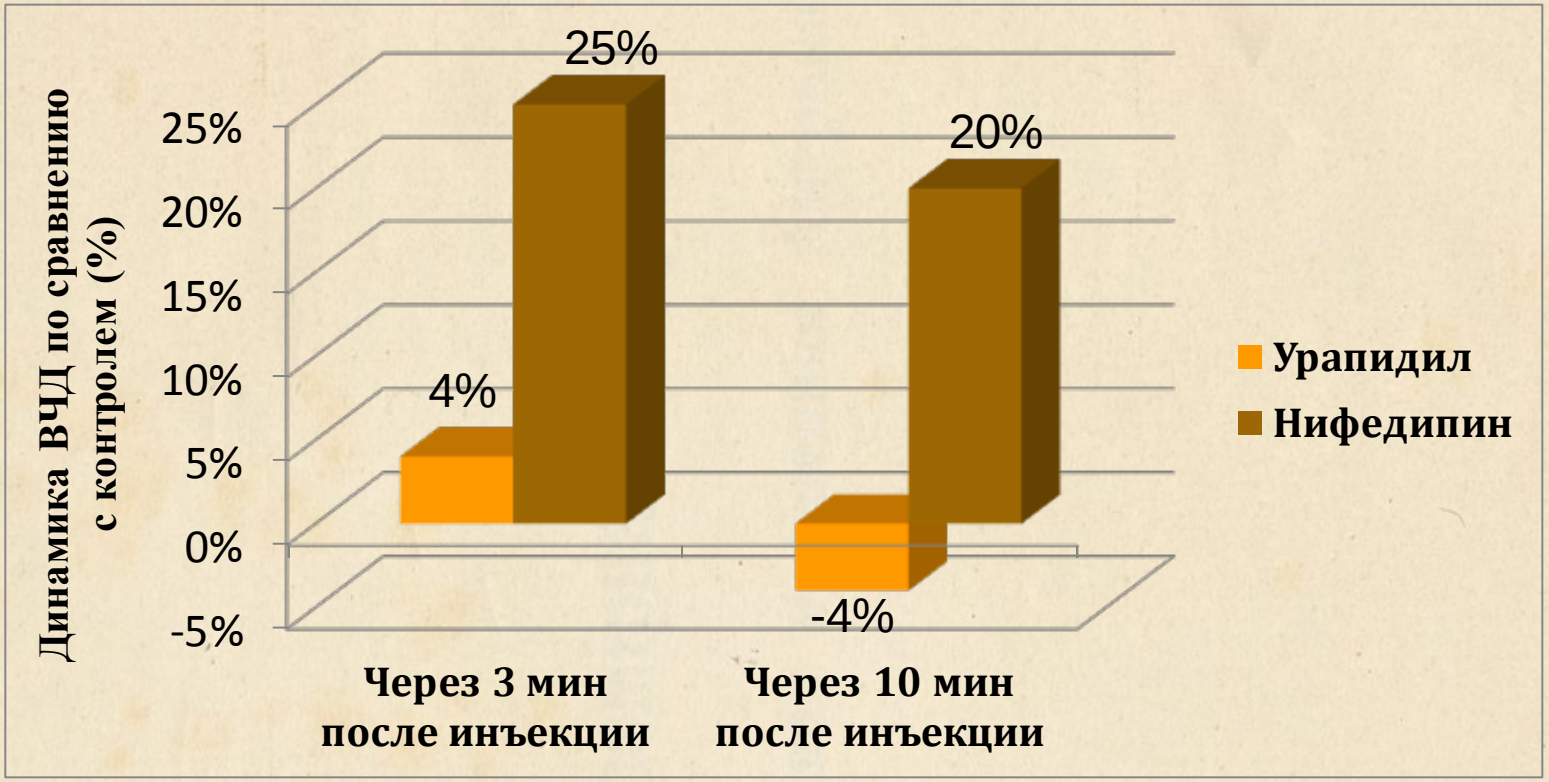
α_1 α_1 α_1 α_1 α_1

Сниженная периферическая резистентность

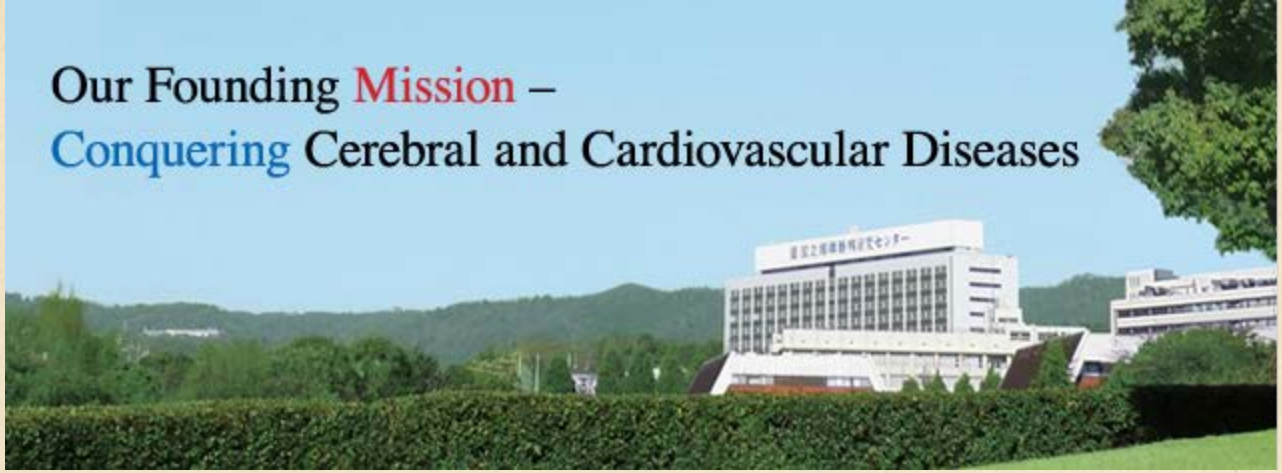
Сосуды

Снижение систолического и диастолического артериального давления

Влияние на внутричерепное давление (ВЧД)

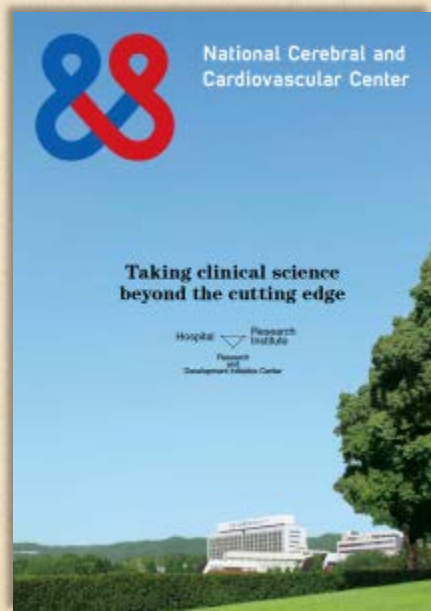


- Урапидил: в/в инъекция 2 мг/кг, затем инфузия 0,5 мг/кг
- Нифедипин: в/в инъекция 0,01 мг/кг, затем инфузия 0,002 мг/кг



Критерии скрининга внутричерепных сосудов у беременных с высоким риском наличия внутричерепной аневризмы

- **Хроническая артериальная гипертензия (160/110)/Гипертоническая болезнь**
- **Цереброваскулярная патология в анамнезе**
- **Возраст > 40 лет**
- **Цереброваскулярная патология в семье**
- **Гестационная артериальная гипертензия**
- **Ожирение – ИМТ > 25**



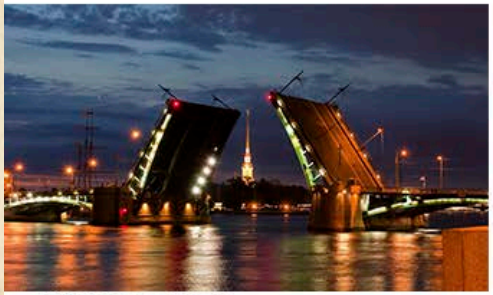
(по данным National Cerebral and Cardiovascular Center, Suita, Osaka, 2009)

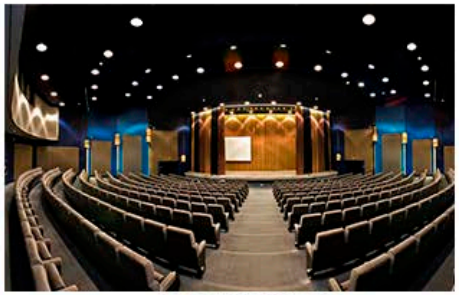
19-21 ОКТЯБРЯ 2016

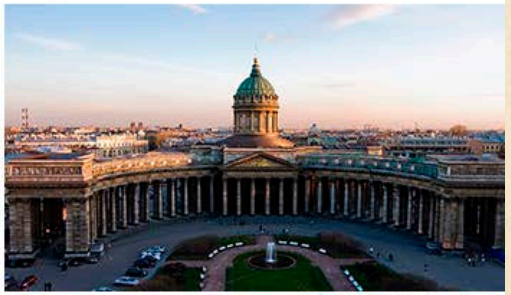
ВТОРОЙ СЪЕЗД

АССОЦИАЦИИ АКУШЕРСКИХ АНЕСТЕЗИОЛОГОВ-РЕАНИМАТОЛОГОВ

МЕСТО ПРОВЕДЕНИЯ: САНКТ-ПЕТЕРБУРГ, пл. Победы,1, ОТЕЛЬ park inn ПУЛКОВСКАЯ







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