



HTA du sujet Noir

**J.P. FAUVEL
L JUILLARD**

**Département de Néphrologie, Dialyse, Hypertension artérielle
Hôpital Edouard Herriot
Lyon**





Particularités:

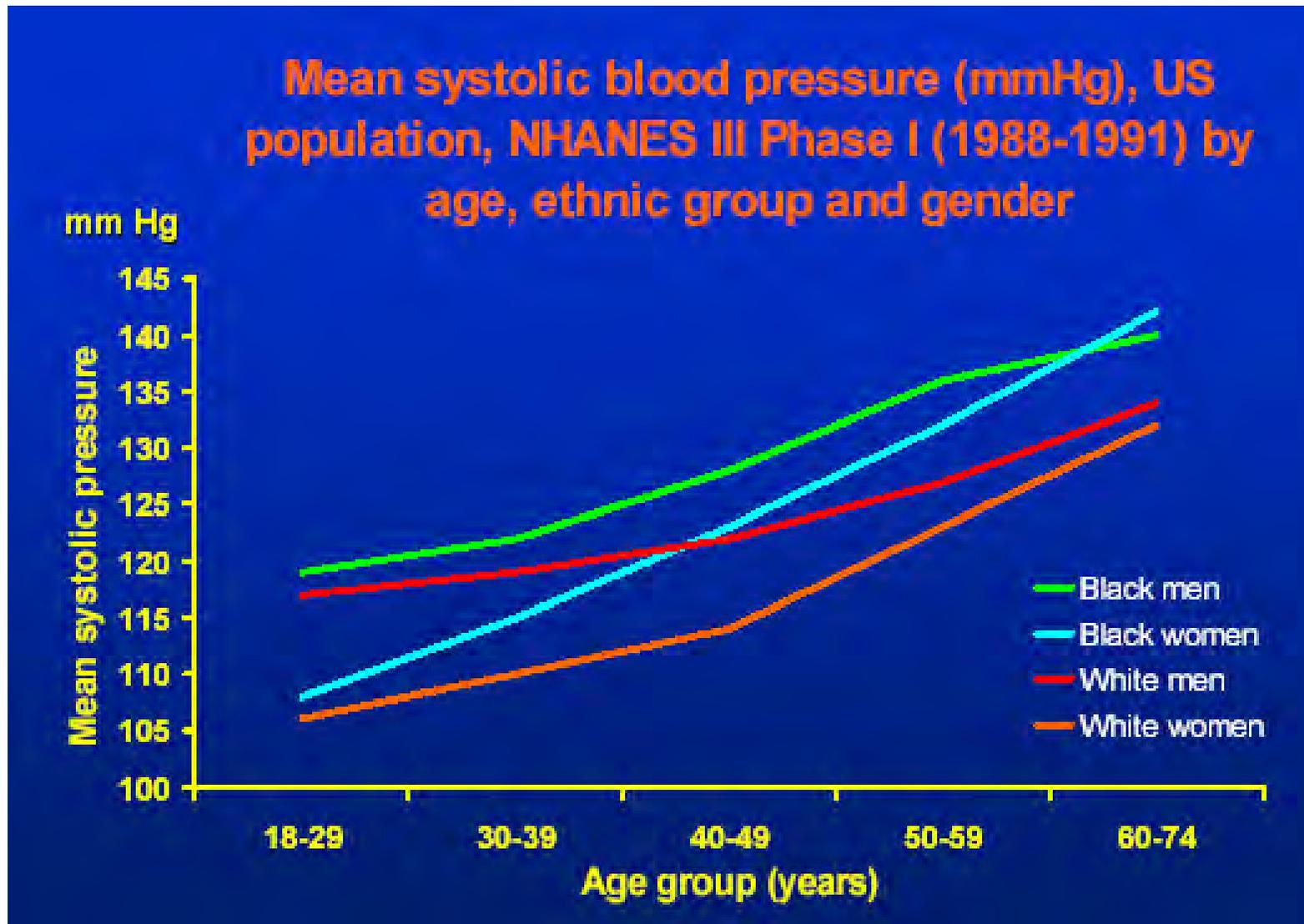
- Epidémiologiques
 - Selon les régions du monde
 - Risques associés
 - Cardiovasculaire
 - Rénal
- Physiopathologiques
 - Facteurs psychosociaux
 - Facteurs alimentaires
 - Facteurs vasculaires
 - Facteurs rénaux
- Thérapeutiques
 - PA
 - Atteinte organes cibles

Qui est Noir ?

Epidémiologie

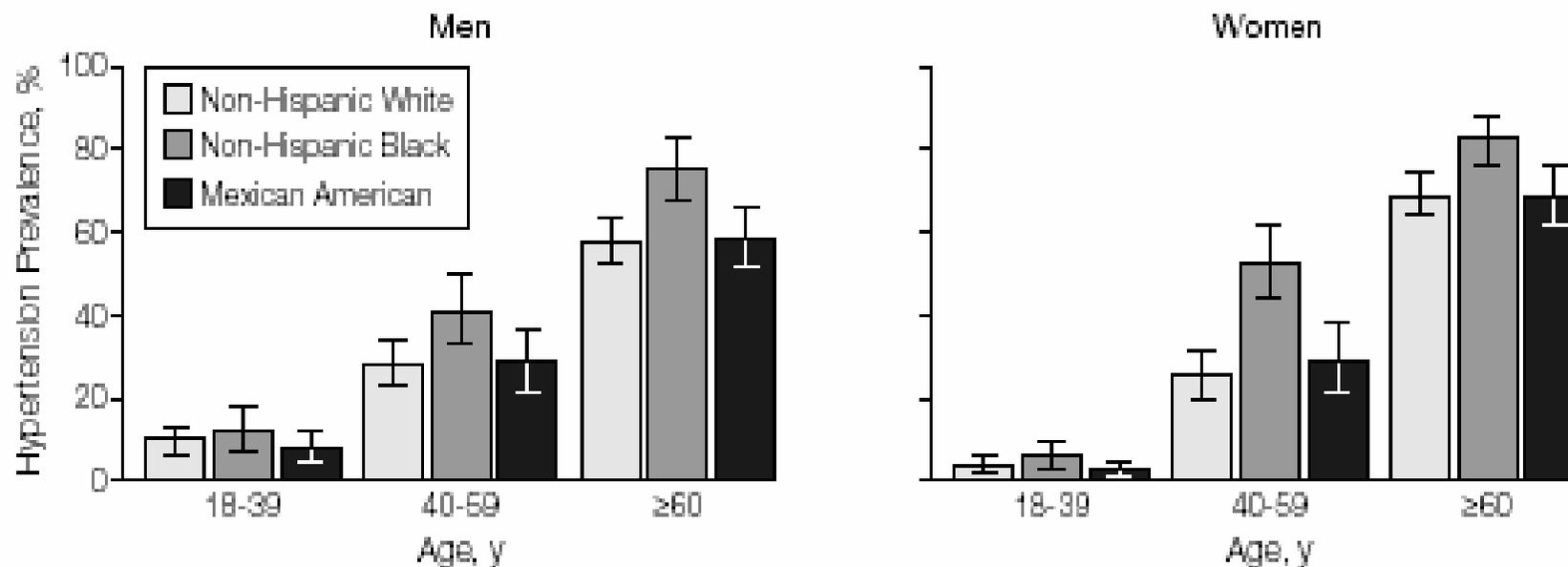
- Monde
- Antilles
- USA

PA aux USA selon les ethnies, l'âge et le sexe



Epidémiologie USA 1988-2000

Figure 1. Hypertension Prevalence by Age and Race/Ethnicity in Men and Women



Error bars indicate 95% confidence intervals. Data are weighted to the US population.

(Hajjar, JAMA 2003, 290, 199-206)

Prévalence de l'HTA chez les Antillais

Men (years)	
< 30	19 (3.2)
30-39	140 (12.2)
40-49	215 (24.4)
> 50	237 (46.9)
Total	611 (19.5)
Women (years)	
< 30	9 (1.8)
30-39	59 (6.3)
40-49	221 (24.4)
> 50	274 (42.6)
Total	563 (18.9)

HTA chez les Antillais

- Forte prévalence chez les femmes
- Meilleur contrôle chez les femmes
13 vs 46%
- Comparaison France métropolitaine
 - Prévalence similaire chez l'homme
 - Prévalence augmentée chez la femme
18.9 vs 9%

Antilles et Métropole

Prévalence de l'HTA

	Hommes		Femmes	
	Antilles	Métropole	Antilles	Métropole
Normotendus	52 (75,4%)	468 (82,8%)	130 (71,4%)	2295 (93,1%)
Hypertendus	17 (24,6%)	95 (16,8%)	52 (28,6%)	169 (6,7%)*

(* : $p < 0,001$)

(Fauvel, JHTA 1994)

	Deaths	DALYs
East Asia and Pacific	13.6%	6.5%
Europe and central Asia	35.0%	19.6%
Latin America and the Caribbean	13.0%	5.1%
Middle East and north Africa	16.5%	6.1%
South Asia	9.6%	4.3%
Sub-Saharan Africa	4.0%	1.7%
Low-income and middle-income economies	12.9%	5.6%
High-income economies	17.6%	9.3%
World	13.5%	6.0%

Table 3: Deaths and disability-adjusted life years (DALYs) attributable to high blood pressure in 2001

	Deaths				DALYs			
	Stroke	Ischaemic heart disease	Hypertensive disease	Other cardiovascular disease	Stroke	Ischaemic heart disease	Hypertensive disease	Other cardiovascular disease
East Asia and Pacific	215	106	57	22	2947	1220	701	238
Europe and central Asia	605	874	85	128	6397	7962	864	1157
Latin America and the Caribbean	140	165	69	42	1899	1764	731	398
Middle East and north Africa	134	294	115	54	1890	3702	1389	673
South Asia	168	266	23	28	2496	3629	361	422
Sub-Saharan Africa	200	166	56	58	2649	2008	707	654
Low-income and middle-income economies [*]	233	250	56	42	3096	2884	679	471
High-income economies	143	229	37	68	1775	2021	334	552
World [†]	214	245	52	47	2815	2700	605	489

^{*}Calculated from combined data for six previous regions. [†]Calculated from combined data for all regions.

Lawes, Lancet 2008

Table 2: Attributable deaths and disability-adjusted life years (DALYs) per 100 000 population per year for high blood pressure for various cardiovascular endpoints in 2001 by region

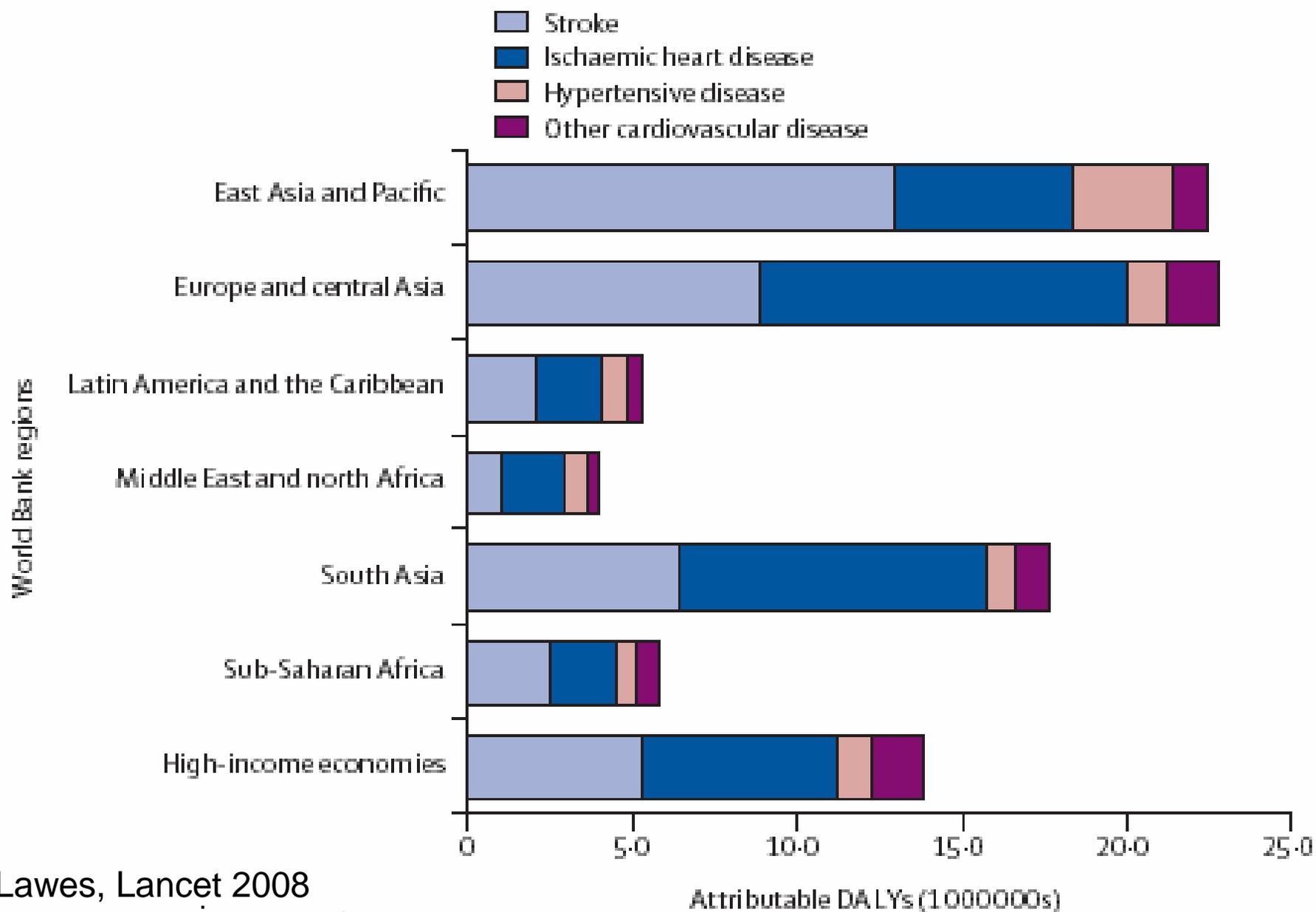


Figure 1: Disability-adjusted life years (DALYs) attributable to high blood pressure by region and endpoint in 2001

Risque CV et Rénal

Risques associés

- Risque cardiovasculaire
 - Coronarien
 - HVG
 - Vasculaire cérébral
 - Périphérique
- Risque rénal
 - Fonction rénale au stade pré-hypertensif
 - Risque d'insuffisance rénale chronique

Facteurs de risque C-V

	Noirs	Blancs
MAPA (mmHg)	(n=82)	(n=63)
- moyenne jour	143/86	136*/84
- moyenne nuit	135/80	123*/75*
IMC (kg/m ²)	31	27*
Rapport T/H	0.88	0.91*
Cholestérol (g/l)	1.93	2.08*
Triglycérides (g/l)	1.08	1.92*
Sens. Insuline	2.04	2.27*
IMVG (g/m ²)	122	92*

(El-Gharbawy, Hypertension 2001, 38:761-66)

Facteurs de risque C-V

TABLE 4. Multivariate Correlates of Cardiac and Renal End Points

Phenotype	Combined Patient group	Blacks	French Canadians
LVM			
Race	0.53 (F=22.7, P<0.000)	...	...
LDL	-0.24 (F=4.8, P<0.03)	...	...
Total cholesterol	...	-0.34 (F=4.6, P<0.04)	...
RWT			
Race	0.49 (F=23.4, P<0.000)	...	...
Night SBP	0.37 (F=13.1, P<0.000)	0.42 (F=7.0, P<0.01)	0.54 (F=8.2, P<0.006)
Microalbumin excretion			
Insulin	0.39 (F=16.0, P<0.000)	0.34 (F=6.3, P<0.02)	...
Triglycerides	...	0.41 (F=9.3, P<0.003)	...
BMI	...	...	0.43 (F=11.8, P<0.001)
Gender	...	...	0.38 (F=9.2, P<0.004)
Inulin clearance			
Race	0.53 (F=28.3, P<0.000)	...	...
Waist circumference	0.36 (F=12.6, P<0.000)	...	...
Sg	0.23 (F=4.8, P<0.03)	0.61 (F=21.6, P<0.000)	...
WHR	...	0.63 (F=28.2, P<0.000)	...
Total cholesterol	...	-0.58 (F=26.8, P<0.000)	...
Si	...	-0.48 (F=15.3, P<0.000)	...
Insulin	...	0.38 (F=11.1, P<0.002)	...
Lithium clearance			
Race	0.41 (F=14.2, P<0.000)	...	...
Night SBP	0.29 (F=7.7, P<0.006)	...	...
WHR	0.24 (F=5.5, P<0.02)	...	...
LDL	...	...	0.37 (F=6.3, P<0.02)

Abbreviations as in Tables 1 and 2.

(El-Gharbawy, *Hypertension* 2001, 38:761-66)

HVG et MAPA

Sujets appariés	Blancs (n=46)	Noirs (46)
PA moy. (mmHg)	142/92	146/93
Δ PA nocturne	16/13	8/8
IMVG (g/m ²)	107	130

(Mayet, Hypertension 1998, 31:1190-94)

Dysfonction systolique

Etude HyperGEN: 2086 hypertendus traités, âge 55 ans,
Noirs=1338 (64%), Blancs=748 (36%):

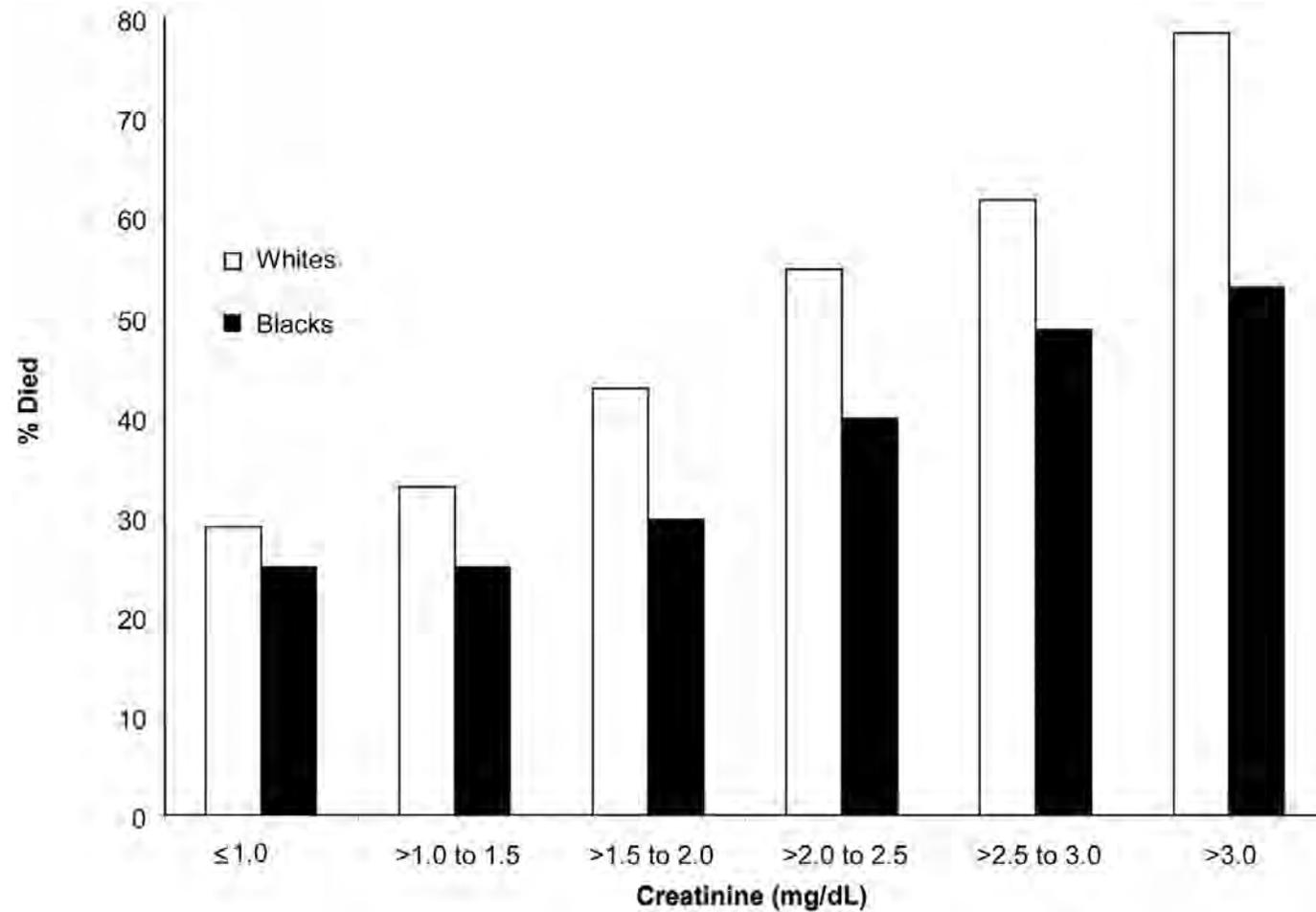
Fraction d'éjection	% patients	% Noirs	% Blancs
> 54%	86		
41 – 54%	10	10.7	8.6
≤ 40%	4	3.9	4.1

Caractères associés à une FE diminuée (multivariée):

- sexe masculin
- diabète
- HVG
- race noire
- acide urique

(Devereux, Hypertension 2001, 38:417-23)

Adjusted mortality by Heart failure according to creatinine and race



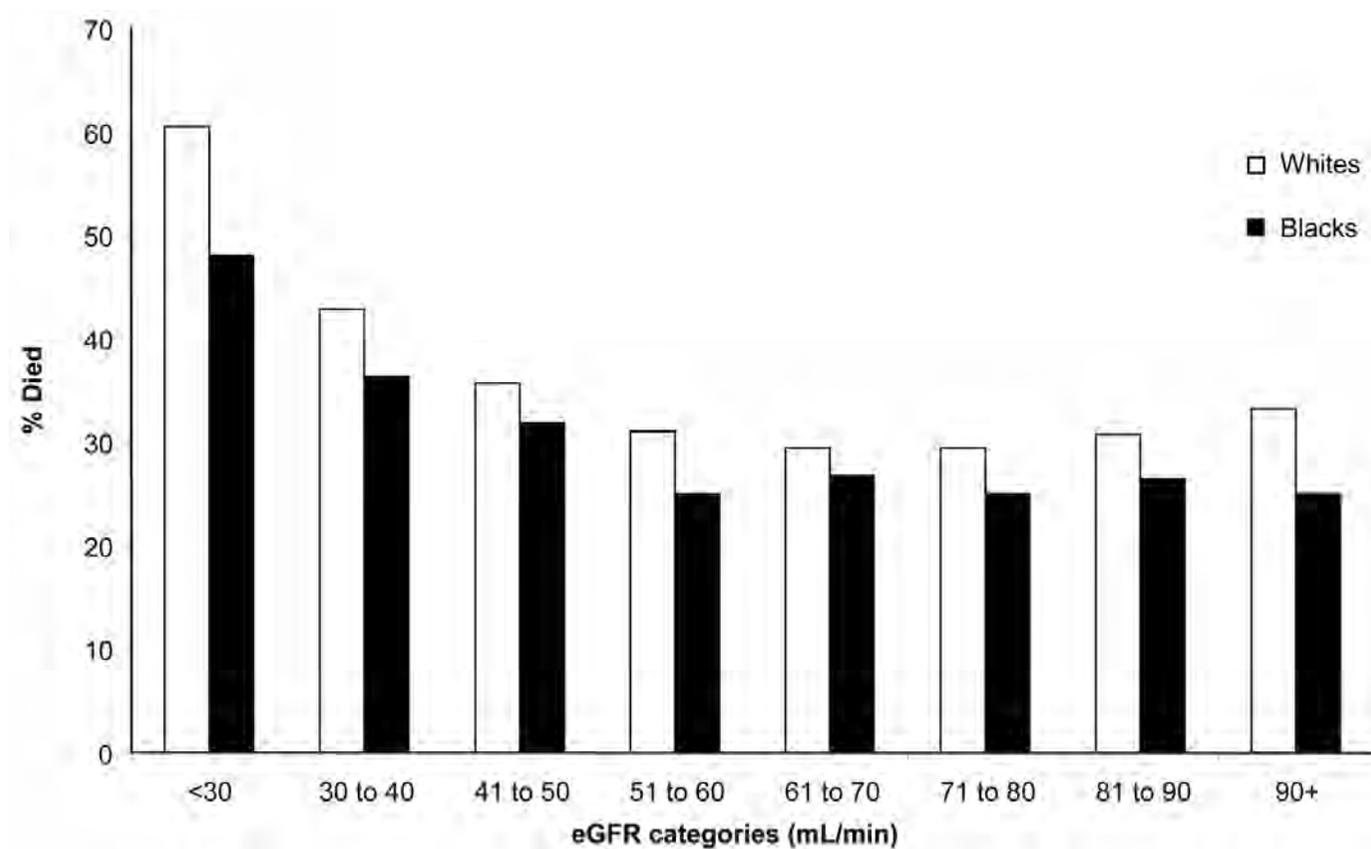
Smith, G. L. et al. *Circulation* 2005;111:1270-1277

Circulation

Copyright ©2005 American Heart Association

American Heart Association 
Learn and Livesm

Adjusted mortality by eGFR and race



Smith, G. L. et al. *Circulation* 2005;111:1270-1277

Circulation

Copyright ©2005 American Heart Association

American Heart
Association® 
Learn and Livesm

Risque coronarien

Atherosclerosis Risk in Communities Study: ARIC:
15792 sujets, 45-64 ans

Evènements coronariens: IdM, revascularisation, ou décès.

	Femmes		Hommes	
	Noirs	Blancs	Noirs	Blancs
Effectif	2298	5686	1396	4682
Ev. Coro.	5.1%	4.0%	10.6%	12.5%
Rapport de risque (ajusté sur l'âge) lié à:				
- Hypertension	5.3	2.7	2.0	1.8
- LDL chol.	1.3	1.4	1.2	1.4
- Diabète	2.3	5.1	1.7	2.4
- Tabac	2.6	2.9	1.7	1.8
- BMI (+ 1 SD)	1.2	1.2	1.0	1.1

(Jones, Arch Intern Med 2002, 162: 2565-2571)

Risque vasculaire cérébral

	Blancs	Noirs
NHANES I⁽¹⁾		
Population	7814	1298
RR ajusté sur âge, PA, diabète:		
- hommes	1	1.1
- femmes	1	1.4
Cincinatti⁽²⁾		
Population	1086462	171718
Premier AVC hémorragique	221	45
RR hémorr. méningée	1	2.1*
RR hémorr. intracérébrale	1	1.4

(1. Kittner, JAMA 1990, 264:1267-70;

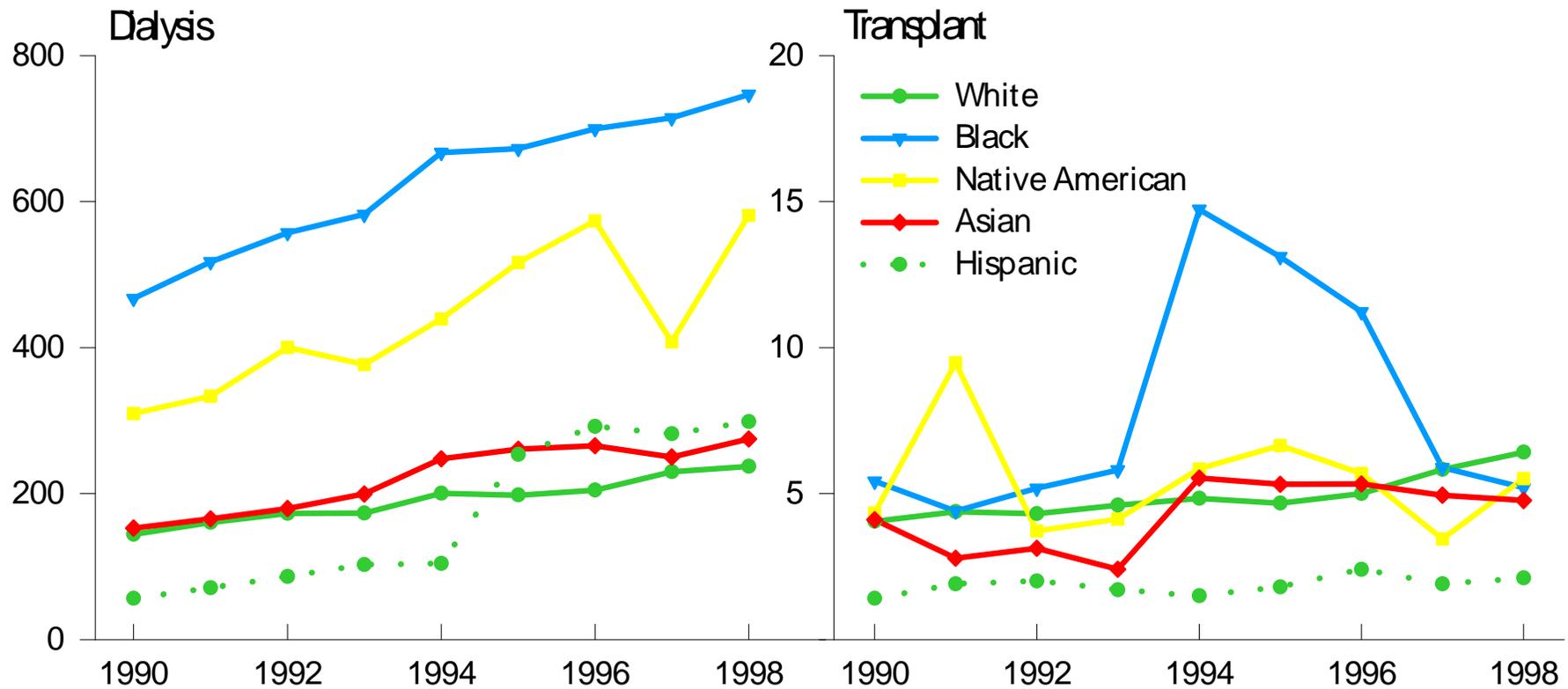
2. Broderick, NEJM 1992, 326:733-6)

Etude INTERHEART Africa

- Risque cardiovasculaire
 - Facteurs risques post IM
 - 558 vs 785 controles
 - 9 pays Afrique sub saharienne
 - Identiques à ceux INTERHEART global
 - Tabac, lipides, PA, Obésité, Diabète
 - 89.2% du risque attribuable

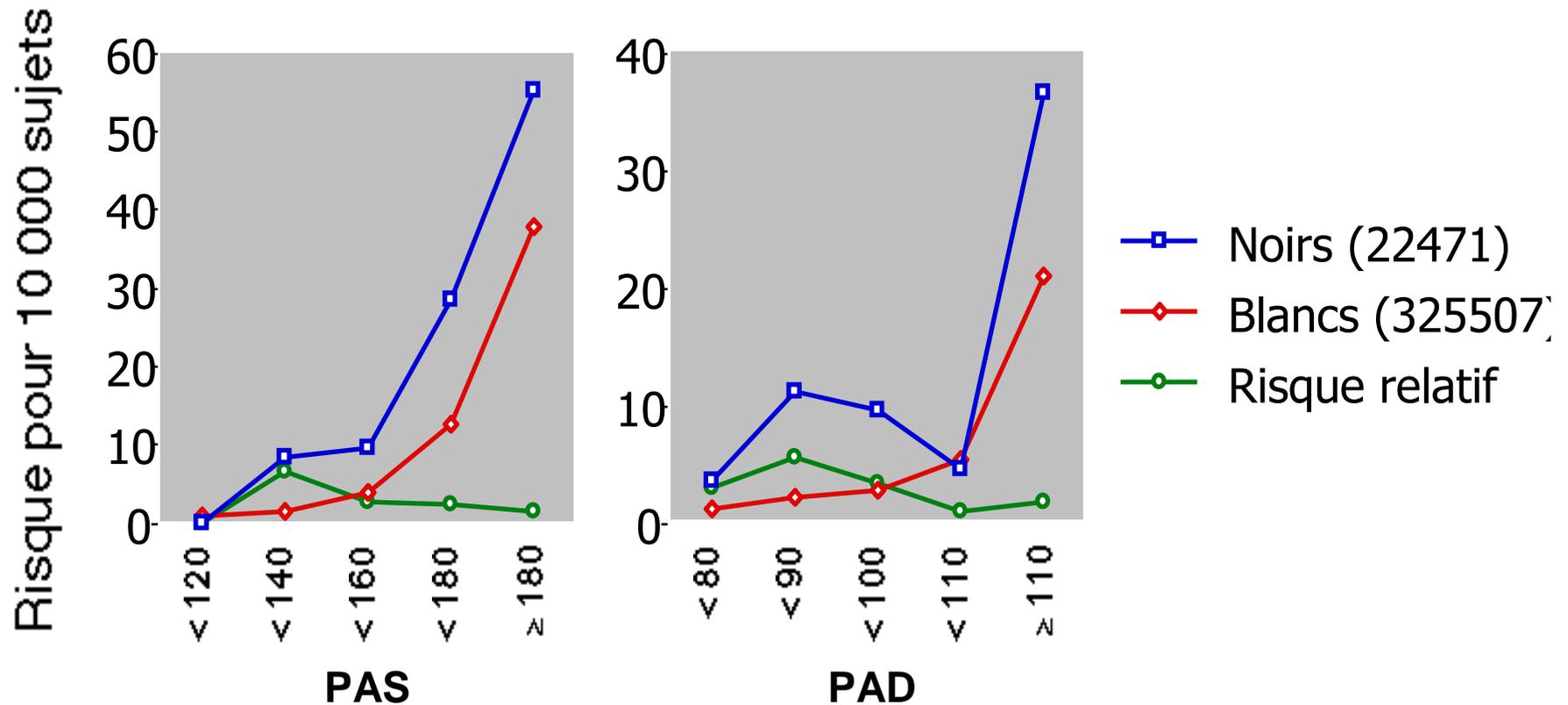
Risque d'IRCT (USRDS 2000)

Incidence (pmh)



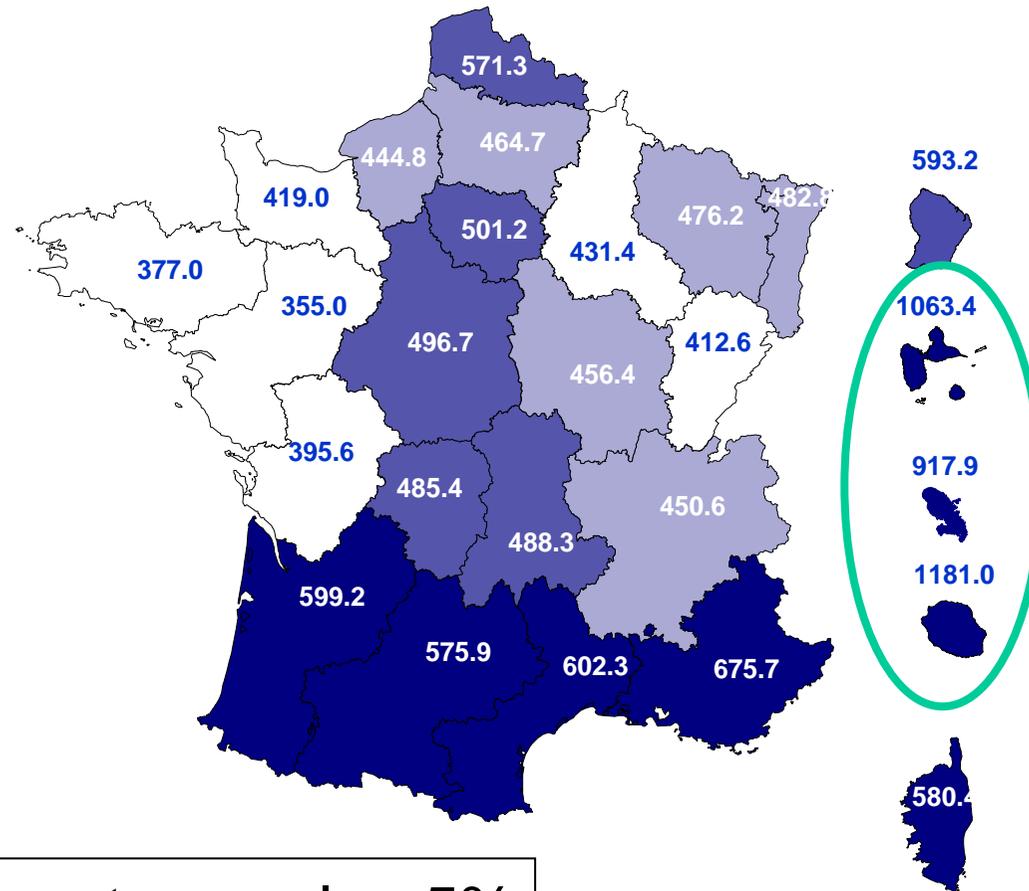
Risque de NHT: pression

MRFIT : mortalité de cause rénale chez 347 978 hommes, suivis 12 ans.



(Flack JM et al., Am J Kidney Dis 1993, 4 (suppl. 1), 31-40)

France: prévalence de l'IRC 513 pmh (30882)



Accroissement annuel: + 5%

Enquête nationale, 2003

Risque de NHT: cohortes

Evolution sous traitement: 11912 vétérans (\approx 50 ans) traités, suivis 15 ans.

Fréquence de l'insuffisance rénale terminale :

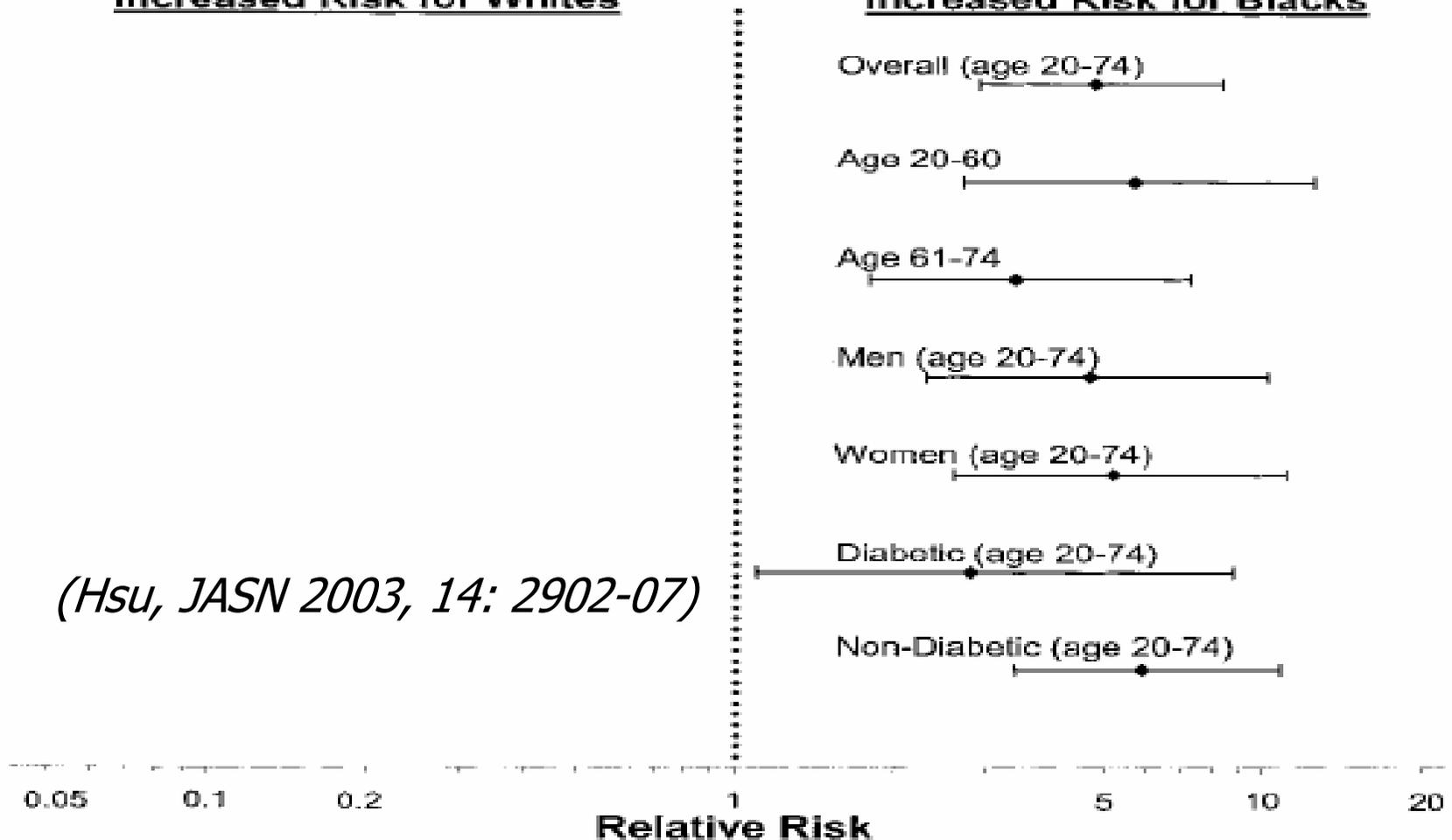
	<u>PAS \leq 136</u>	<u>PAS $>$ 136</u>	<u>Total</u>	
			<u>Noirs</u>	<u>Blancs</u>
Effectif	4864	4780	5730	6182
IRC - T	67	132	163	82*
	(1,38%)	(2,76%)	(2,84%)	(1,33%)

(Perry HM et al., Hypertension 1995, 25, 587-594)

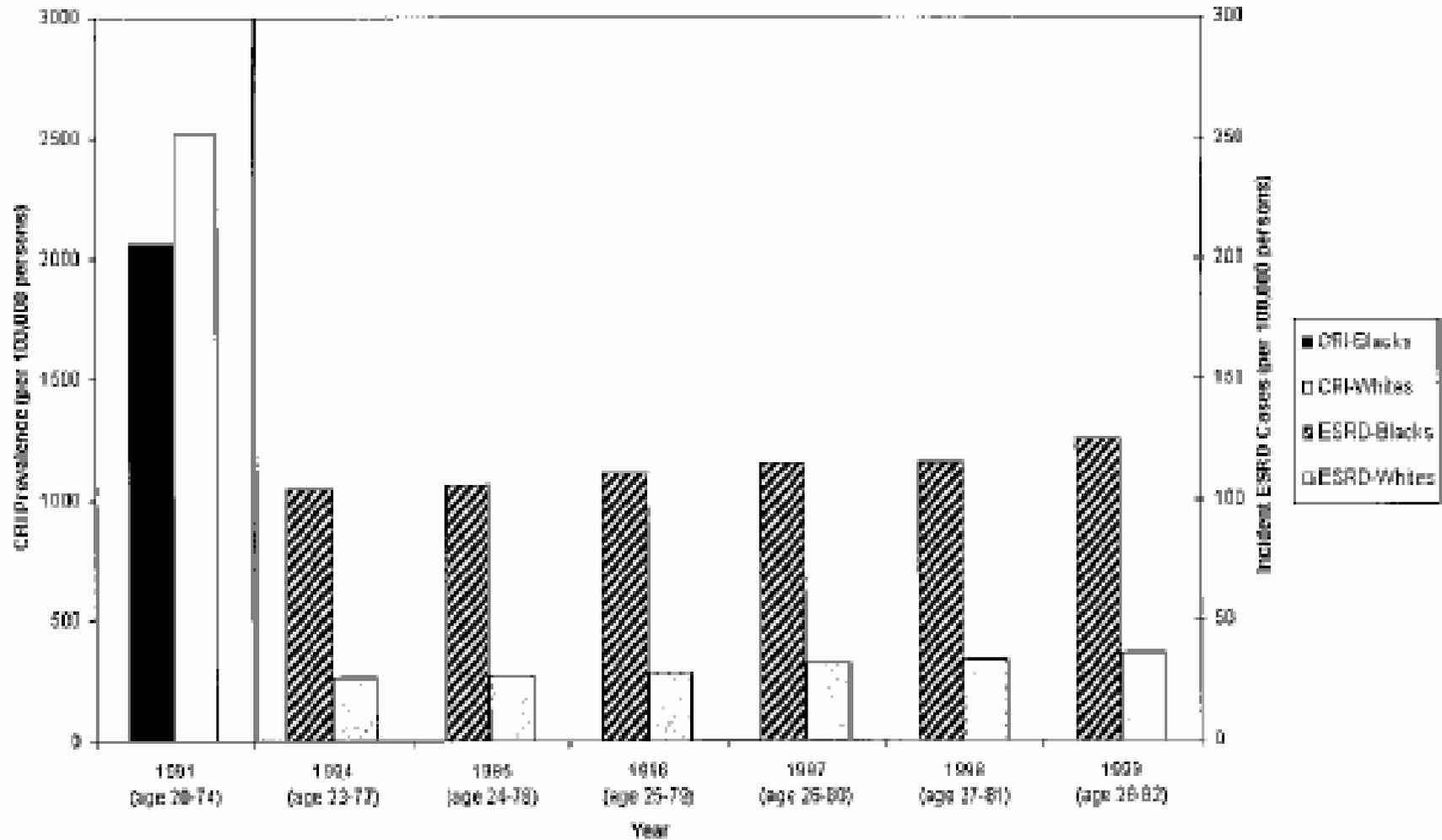
Risque d'IRCT: NHANES III

Increased Risk for Whites

Increased Risk for Blacks



Risque d'IRCT vs IR: NHANES III



(Hsu, JASN 2003, 14: 2902-07)

Epidémiologie et risque d'IRCT

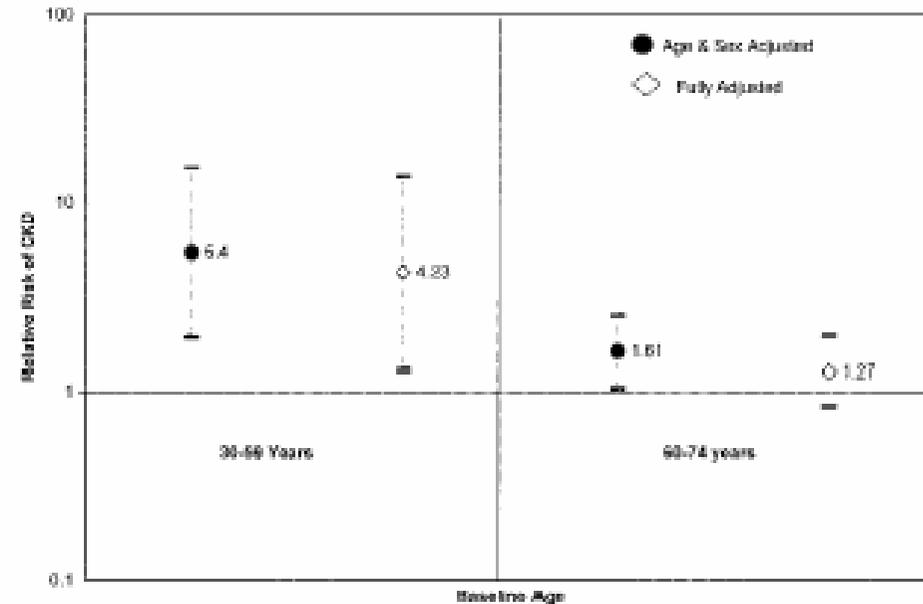
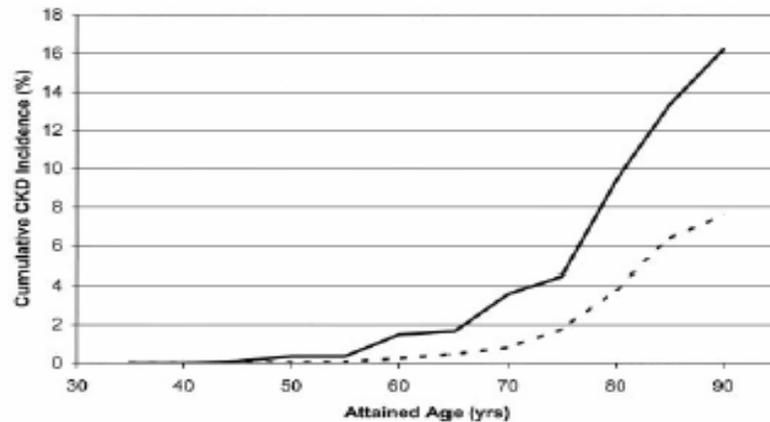


Table 3. Excess risk of CKD among African Americans versus whites in relation to potentially modifiable risk factors^a

Adjusted for	RR for African Americans (versus Whites)	Excess Risk Explained (%) ^b
Age and gender only	2.69 (1.50 to 4.82)	
Sociodemographic factors ^c	2.49 (1.33 to 4.67)	11.8
Lifestyle factors ^d	2.29 (1.31 to 4.01)	23.7
Clinical factors ^e	2.15 (1.18 to 3.92)	32.0
All risk groups ^f	1.95 (1.05 to 3.63)	43.8

Risques associés: Conclusion

- Risque cardiovasculaire
 - Identique mais exposition différente aux facteurs de risque classiques
- Risque rénal
 - Semble spécifiquement plus élevé

Particularités physiopathologiques

- Facteurs et groupes à risque
 - Environnement:
 - Apports sodium/potassium
 - Excès pondéral
 - Facteurs génétiques
 - Hémodynamique rénale
 - Fonction vasculaire

Sodium & potassium (observations)

Rapport sodium / potassium urinaire chez 325 migrants urbains (Nairobi) et 267 ruraux de la même tribu (Luo):

Suivi (mois)	Hommes			Femmes		
	Ruraux	Urbains	P	Ruraux	Urbains	P
0	2.5	4.3	.001	2.8	4.0	.001
6	2.3	4.8		2.5	3.8	
12	2.3	4.5		2.6	3.9	
24	2.8	4.3		2.7	3.9	

(Poulter, BMJ 1990, 300:967-72)

Excès pondéral (observations)

Influence du poids sur la prévalence (%) de l'HTA:

	Hommes		Femmes	
	Antilles	Métropole	Antilles	Métropole
BMI < 25	14,8%	8,2%	13,6%	3,4%
Risque relatif	1,8		4	
BMI ≥ 25	31,0%	30,0%	40,6%	19,1%*
Risque relatif	1,0		2,1	

(* : $p < 0,001$, chi2)

(*Fauvel, JHTA 1994*)

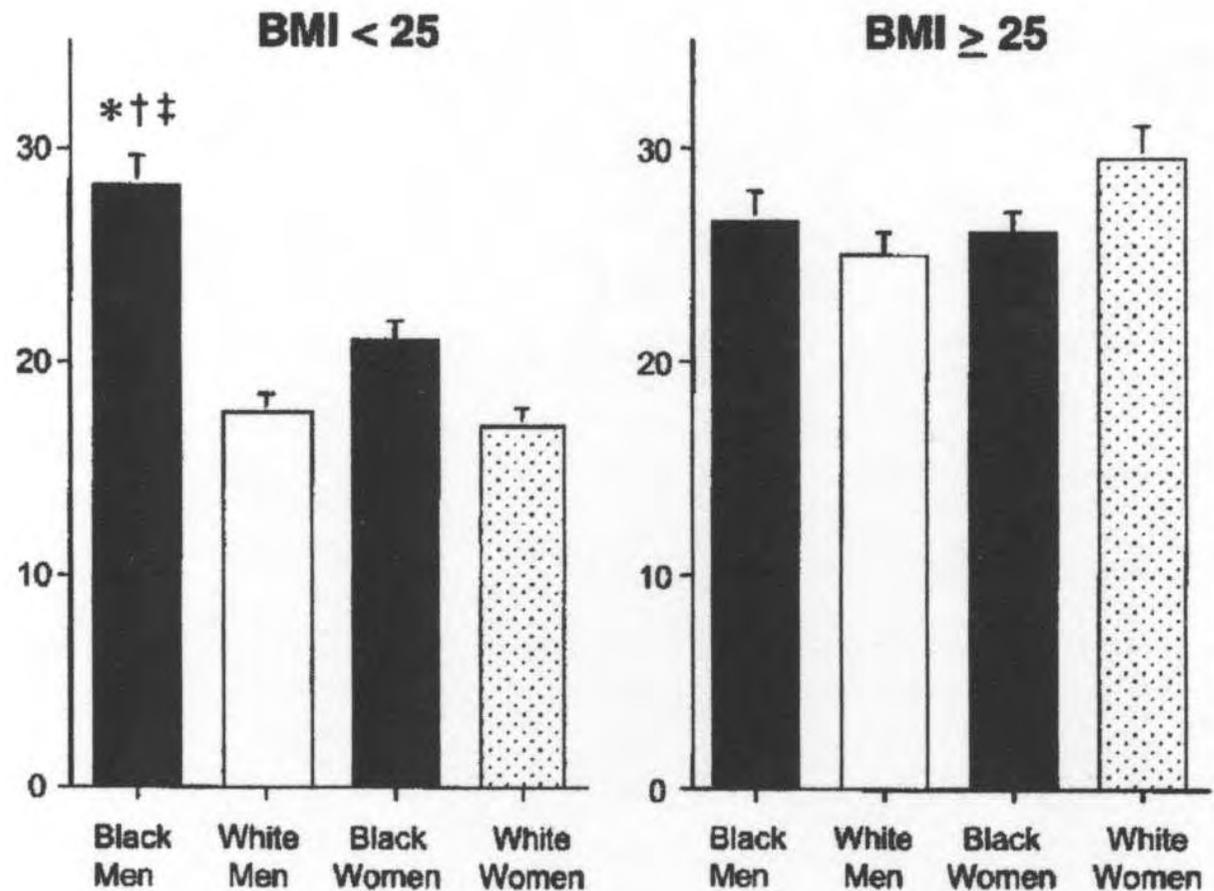
Fonction vasculaire

- Réponses sympathiques
 - A l'état basal
 - Catécholamines plasmatiques: pas de différence
 - Activité sympathique: selon poids et sexe
 - Rôle du stress
 - Stress psychosocial: pas de différence
 - Cold pressor test: ↗ supérieure de l'activité sympathique
- Réactivité vasculaire
 - Tonus basal: pas de différence
 - Réponses vasoconstrictrices: ↗
 - Réponses vasodilatatrices: ↘

Activité sympathique basale

Rôle du poids et du sexe sur l'activité sympathique mesurée par micro-neurographie.

Sujets normotendus noirs (n=92) et blancs (n=45), âge moyen 30 ans.

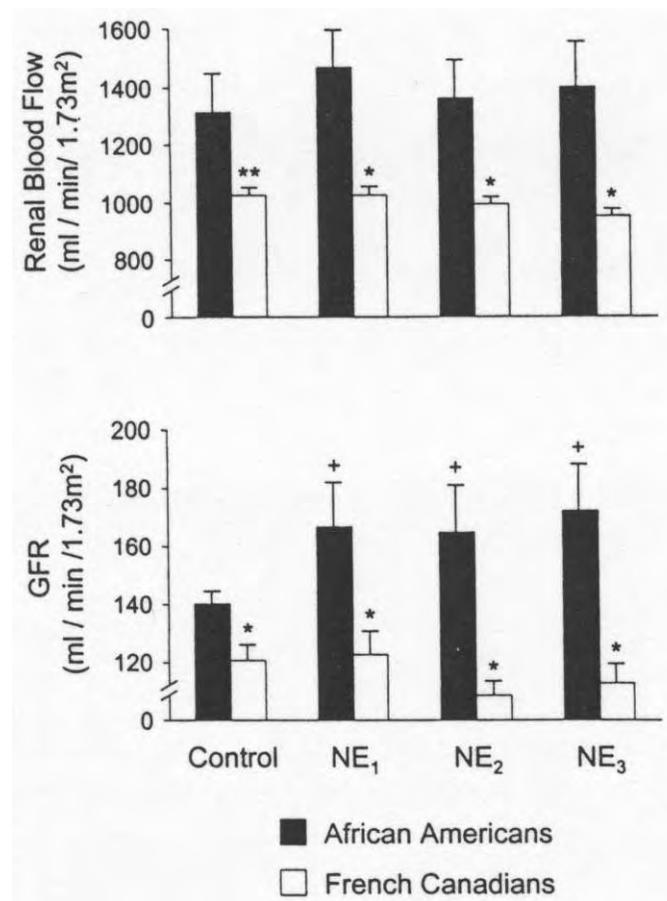
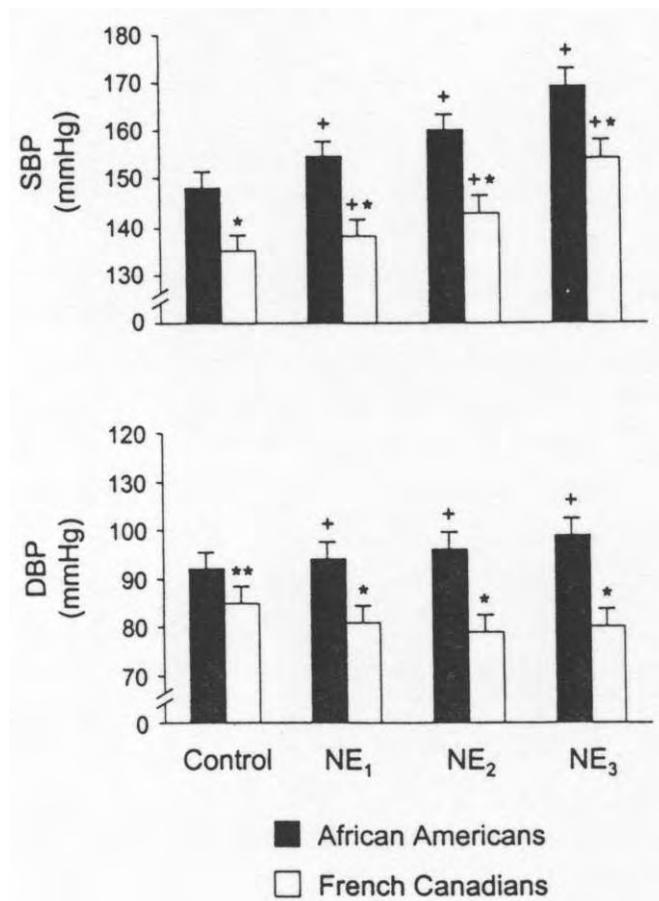


(Abate, Hypertension 2001, 38:379-83)

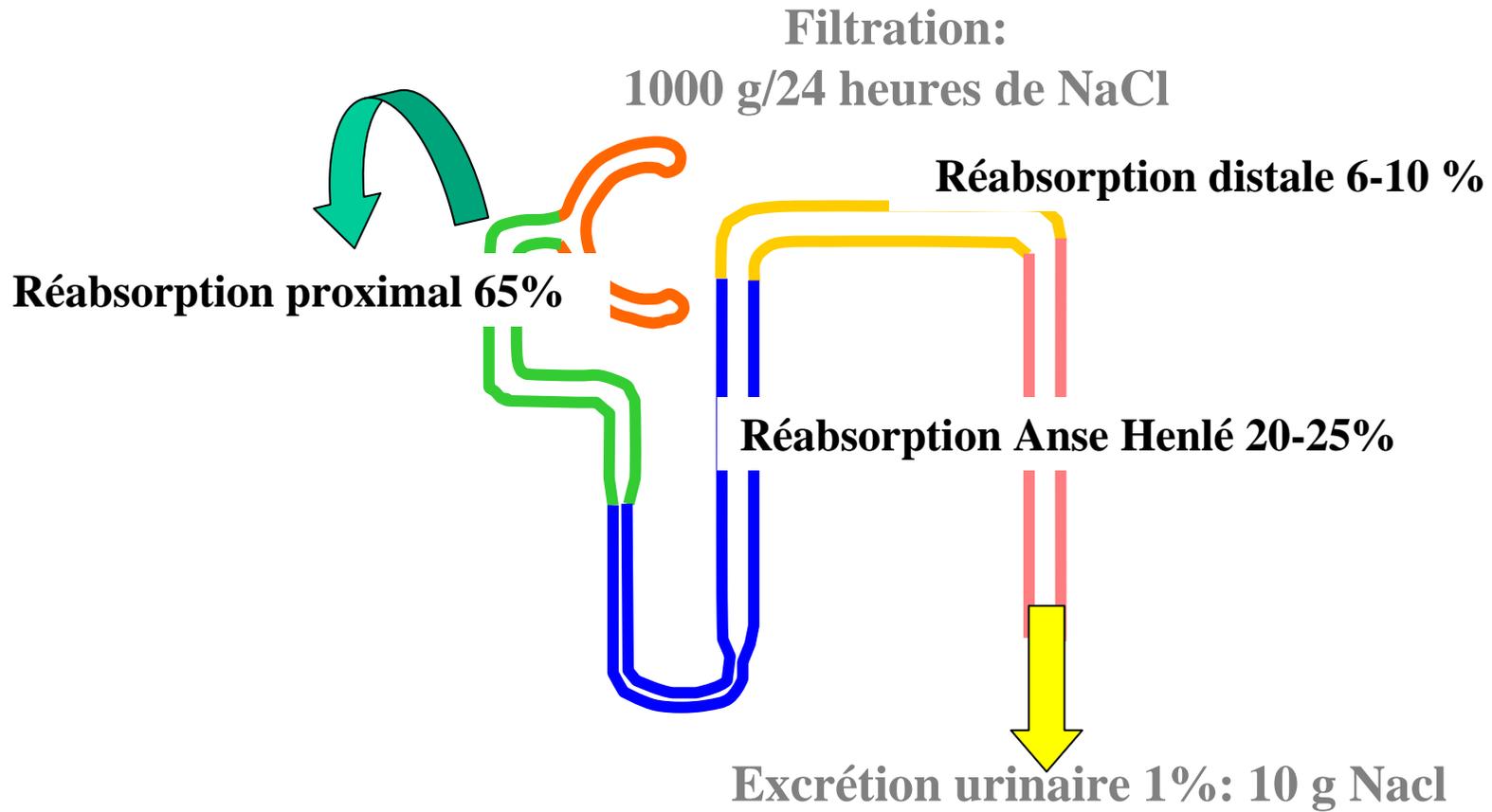
Réponse PA et rénale à la NAd

Noradrénaline 0.01, 0.025, 0.05 $\mu\text{g}/\text{kg}/\text{min}$, 30 min.

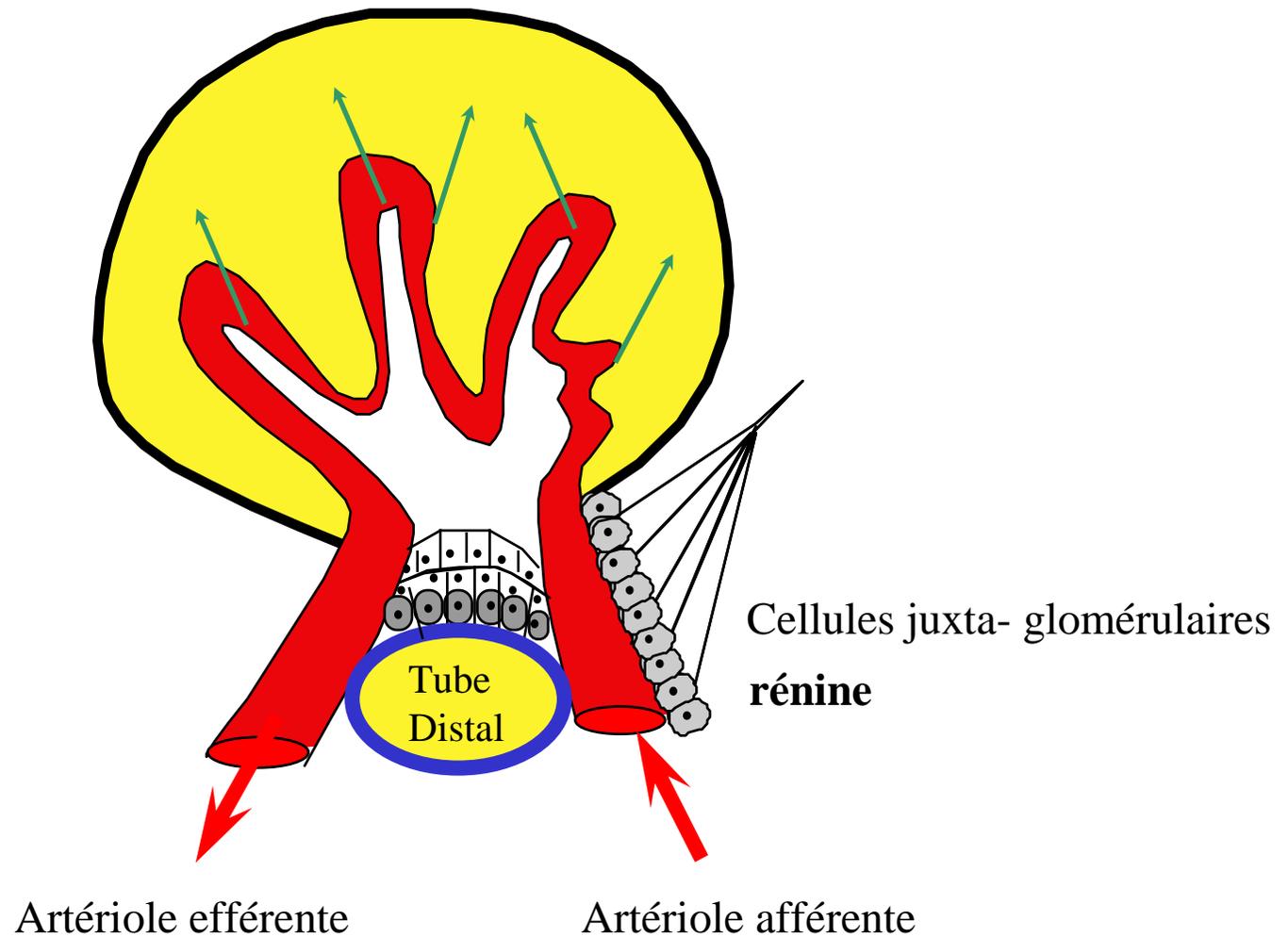
chez 62 HT Noirs (n=29) et 33 Blancs (n=33) canadiens.



Excrétion de sodium

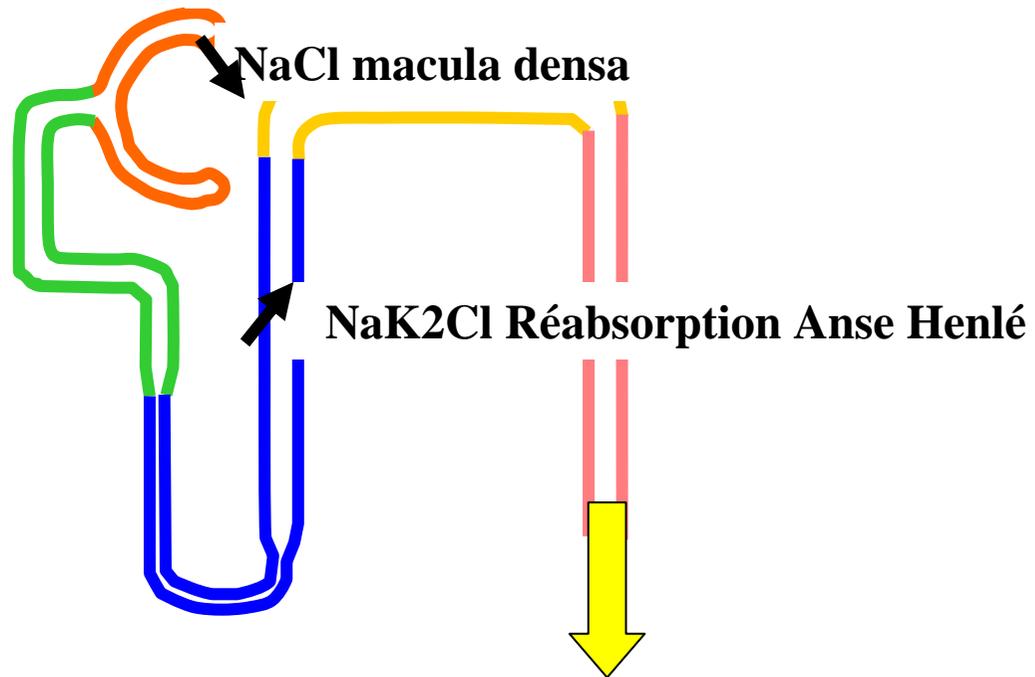


Feedback tubulo-Glomerulaire



FTG

Vasodilatation Artériolaire Afférente



Expansion volémique
Rénine Basse
Hyperfiltration
Fibrose vasculaire rénale

Facteurs génétiques

- Système rénine-angiotensine:
 - ECA: génotype DD
 - ATG: pas de différence sur M235T et T174M
- Canal sodium épithélial β :
 - Mutation T594M: OR 4.17, femmes, rénine basse, effet de l'amiloride (*Baker, Hypertension 2002, 40:13*)
- Système sympathique:
- NO synthase

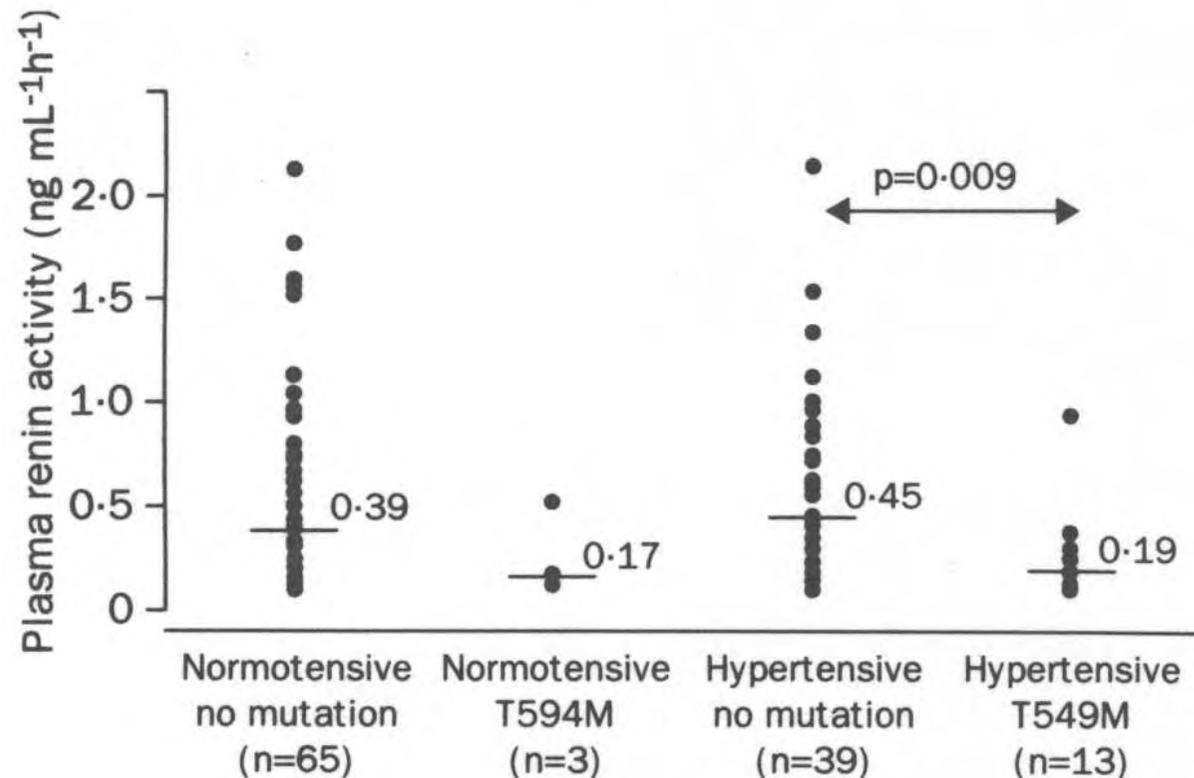
Genetique: canal sodium

Activité rénine plasmatique et pression artérielle selon la présence du variant T594M (5% des Noirs).

(*Baker, Lancet 1998, 351:1388-92*)

Le variant T594M est corrélé chez les Noirs avec la réponse à l'amiloride.

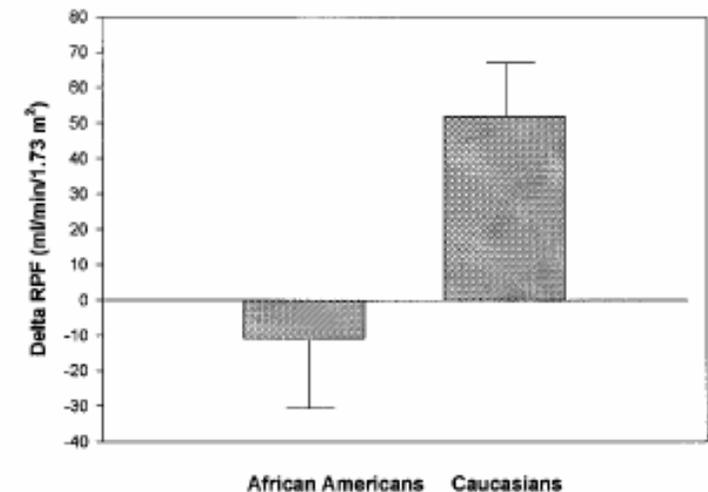
(*Baker, Hypertension 2002, 40:13*)



Hémodynamique rénale et sel

Réponse au sel chez des hypertendus Noirs (19) ou Blancs (22).

Subjects	Blacks	Whites
Low salt		
RPF, mL/min/1.73m ²	586±21	585±16
GFR, mL/min/1.73m ²	108±5.6	112±3.6
FF, %	18.4±0.7	18.5±0.8
High salt		
RPF, mL/min/1.73m ²	575±24*	636±20†
GFR, mL/min/1.73m ²	117±5.9	124±5.4
FF, %	19.6±0.8	18.4±0.6



RPF indicates renal plasma flow; GFR, glomerular filtration rate; FF, filtration fraction.

* $P=0.033$ vs whites on high salt; † $P=0.05$ vs whites on low salt.

(Price, Hypertension 2002, 40:186-189)

Particularités thérapeutiques

- Efficacité des prises en charge
- Qualité du contrôle tensionnel
- Comparaison des différentes classes
 - Sur l'abaissement tensionnel
 - Sur l'HVG
 - Sur la protection rénale

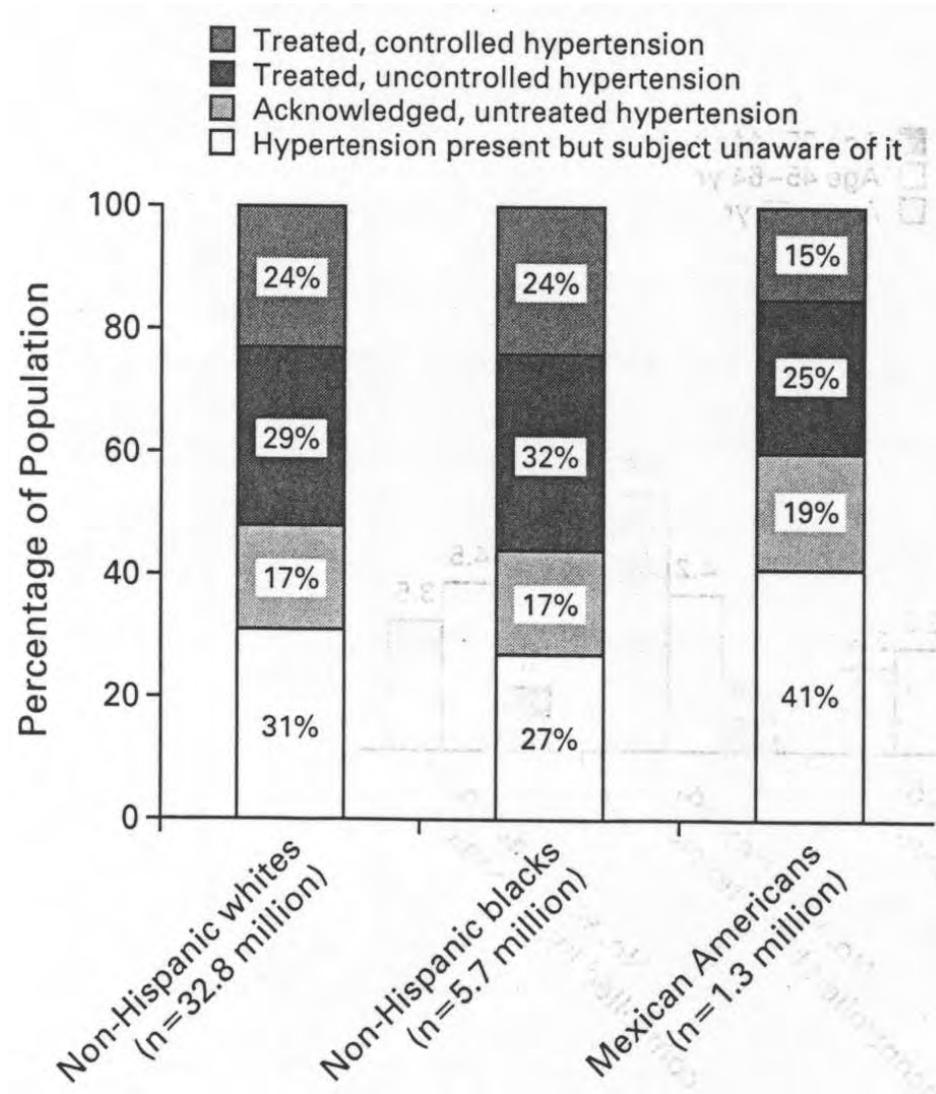
Qualité du contrôle tensionnel

NHANES III.

16095 adultes.

PA > 140/90 mmHg.

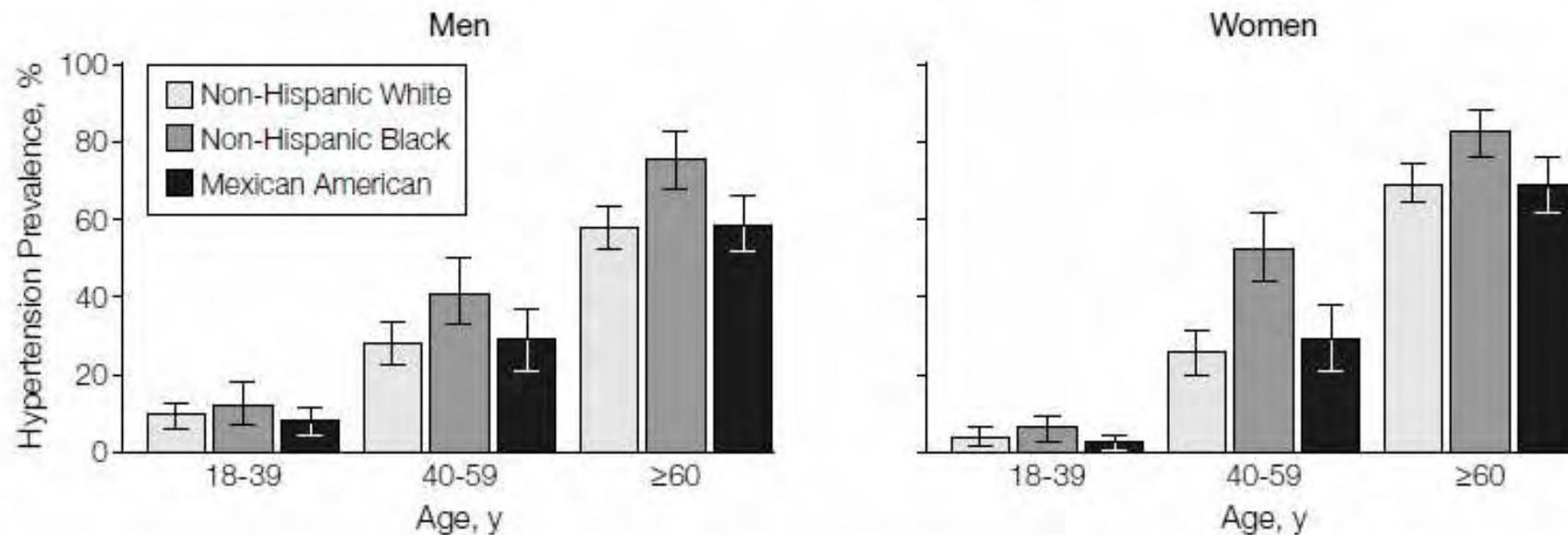
L'HTA est plus fréquente chez les Noirs, mais la qualité du contrôle est équivalente.



(Hyman, NEJM 2001, 345: 479-86)

Epidémiologie USA 1988-2000

Figure 1. Hypertension Prevalence by Age and Race/Ethnicity in Men and Women

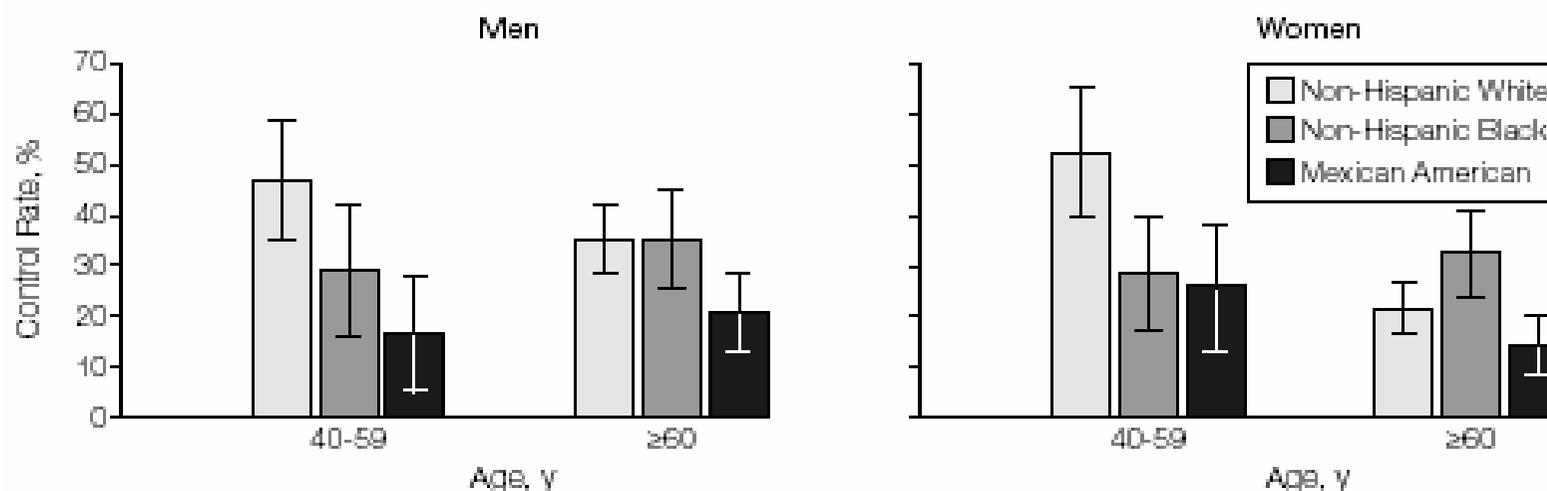


Error bars indicate 95% confidence intervals. Data are weighted to the US population.

(Hajjar, JAMA 2003, 290, 199-206)

Epidémiologie USA 1988-2000

Figure 2. Overall Hypertension Control Rates in 1999-2000 by Age and Race/Ethnicity in Men and Women



Error bars indicate 95% confidence intervals. Data are weighted to the US population. For comparisons between racial/ethnic groups (with non-Hispanic whites as the referent), *P* values are as follows: for Mexican Americans, men aged 40 to 59 years, *P* < .001, men aged at least 60 years, *P* = .003, women aged 40 to 59 years, *P* = .002, and women aged at least 60 years, *P* = .04; for non-Hispanic blacks, men aged 40 to 59 years, *P* = .02, men aged at least 60 years, *P* = .51, women aged 40 to 59 years, *P* = .003, and women aged at least 60 years, *P* = .98.

Lifestyle Recommendations for Hypertension: Dietary

- Fresh Fruits
- Vegetables
- Low Fat dairy products
- Low fat diet in accordance with the DASH diet

Dietary Sodium

Restrict to target range of 65-100 mmol/day

(Most of the salt in food is hidden and comes from processed food)

Dietary Potassium

If required, daily dietary intake >80 mmol

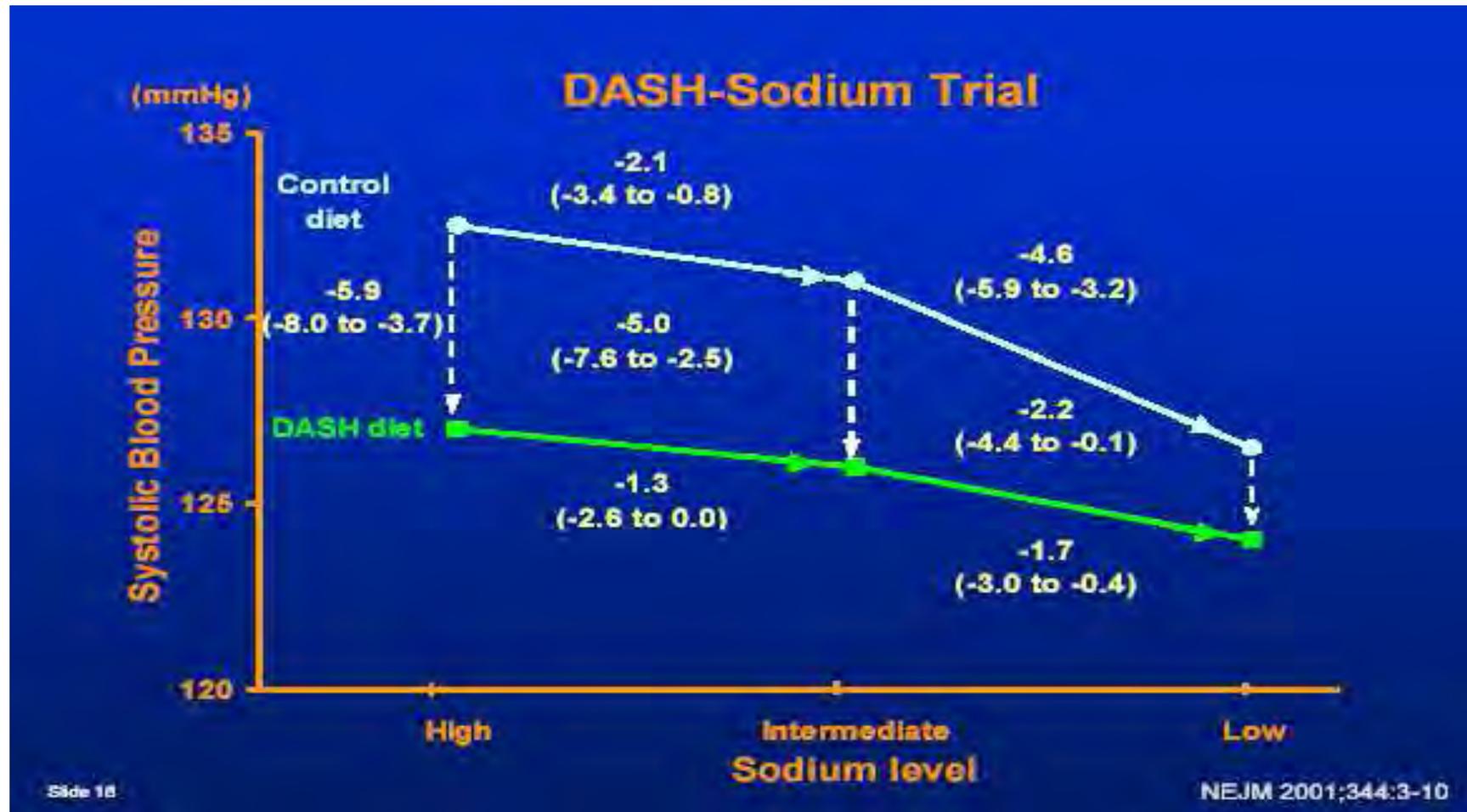
~~Calcium supplementation~~

~~No conclusive studies for hypertension~~

~~Magnesium supplementation~~

~~No conclusive studies for hypertension~~

Etude DASH



Impact of Lifestyle Therapies on Blood Pressure in Hypertensive Adults

Intervention	Change	SBP/DBP
Sodium intake	- 100 mmol/day	-5.8 / -2.5
Weight	- 4.5 kg	-7.2 / -5.9
Alcohol intake	- 2.7 drinks/day	-4.6 / -2.3
Exercise*	3 times/week	-7.4 / -5.8
Dietary patterns	DASH diet	-11.4 / -5.5

* 1- Exercise and Hypertension. *Medicine & Science in Sports & Exercise*. 36(3):533-553, March 2004.

2- Result of aggregate and metaanalyses of short term trials. Miller ER et al. *J Clin Hyper* 1999: Nov/Dec:191-8.

Potassium (interventions): DASH

	Blancs (n=156)	Noirs (n=275)
Age (ans)	46	44
Femmes (%)	33	59
PAS (mmHg)	130.9	131.8
PAD (mmHg)	84.5	84.8
Hypertendus (%)	26	32
Obèses (%)		
- hommes	46	57
- femmes	54	66
Δ PAS (mmHg)	-3.3	-6.9
Δ PAD (mmHg)	-2.4	-3.7

(Svetkey, Arch Intern Med 1999, 159:285-93)

Sodium (interventions): DASH-2

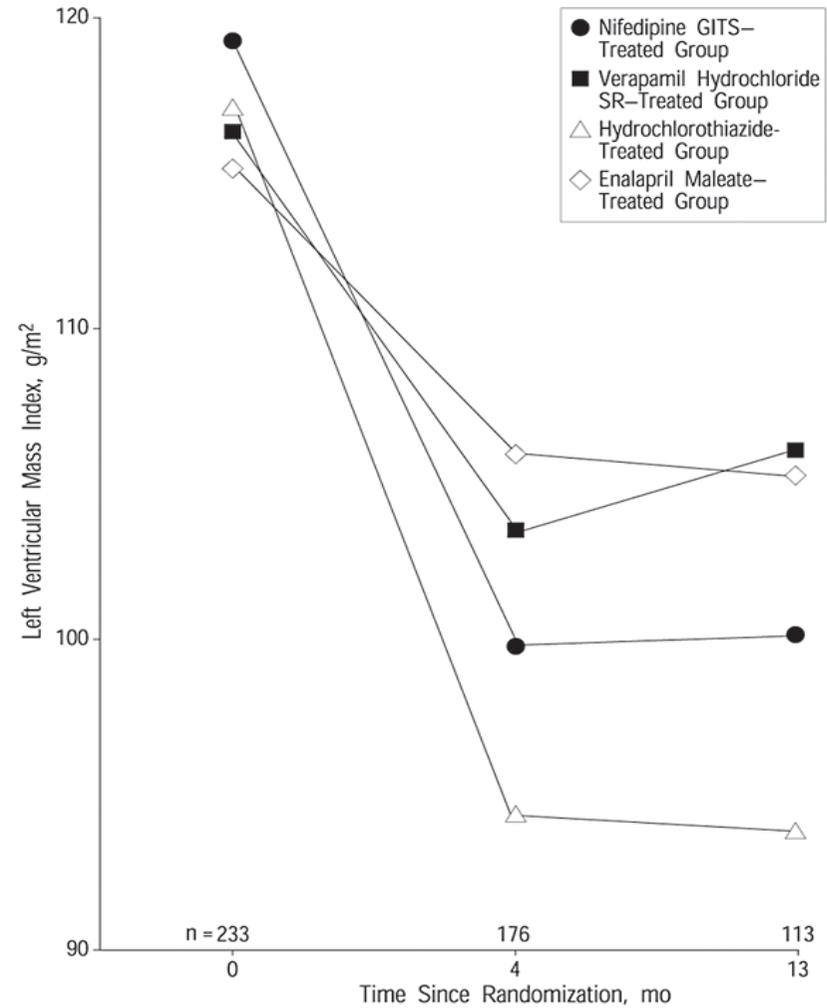
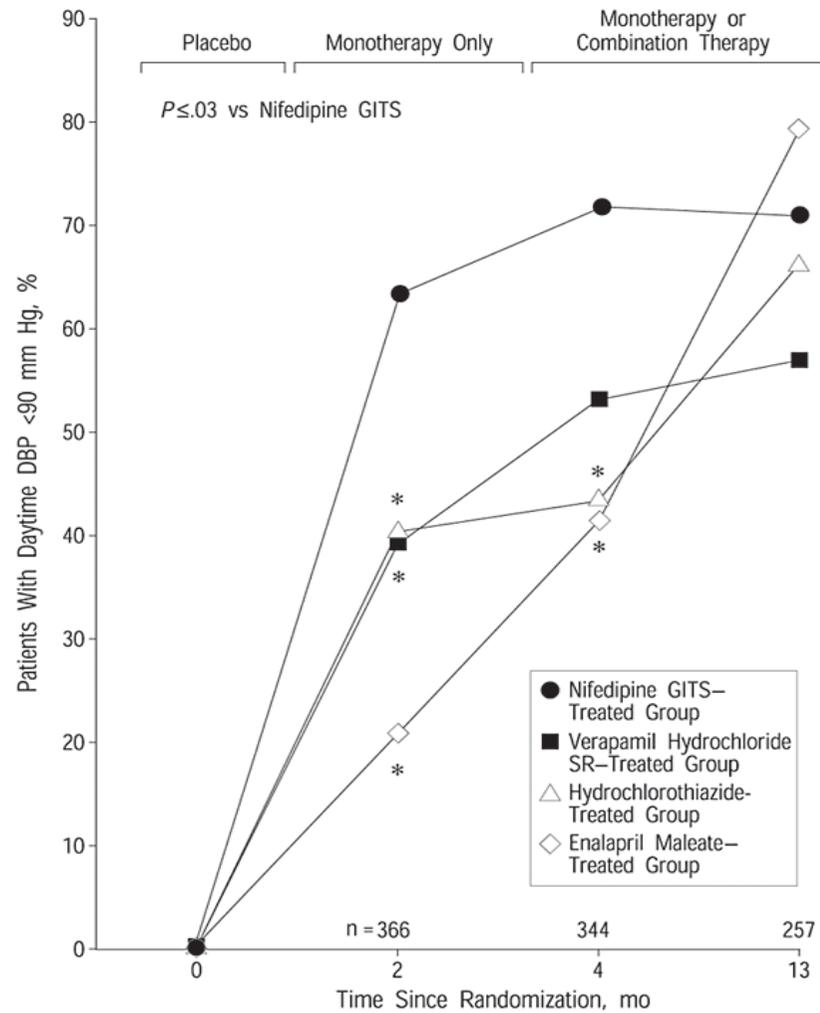
Comparaison high-salt (8 g/j) vs low-salt (3 g/j), dans une population avec 56% de sujets Noirs:

	Δ PAS (mmHg)
Hypertendus	11.5
- Noirs	12.6*
- Autres	9.5
Normotendus	7.1
- Noirs	7.2
- Autres	6.9
Hommes	6.8
Femmes	10.5

* $p=0,007$

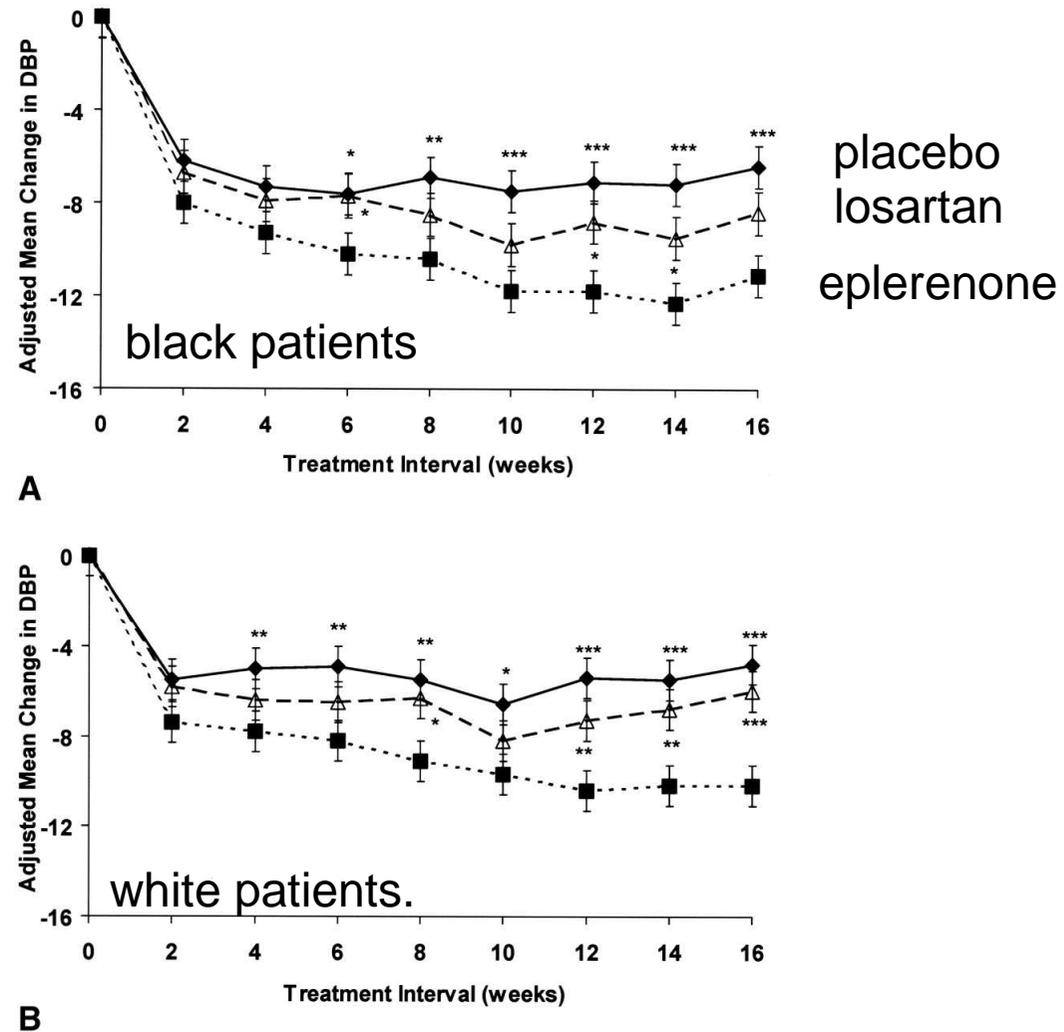
(Sacks, NEJM 2001)

Efficacité des classes AHT



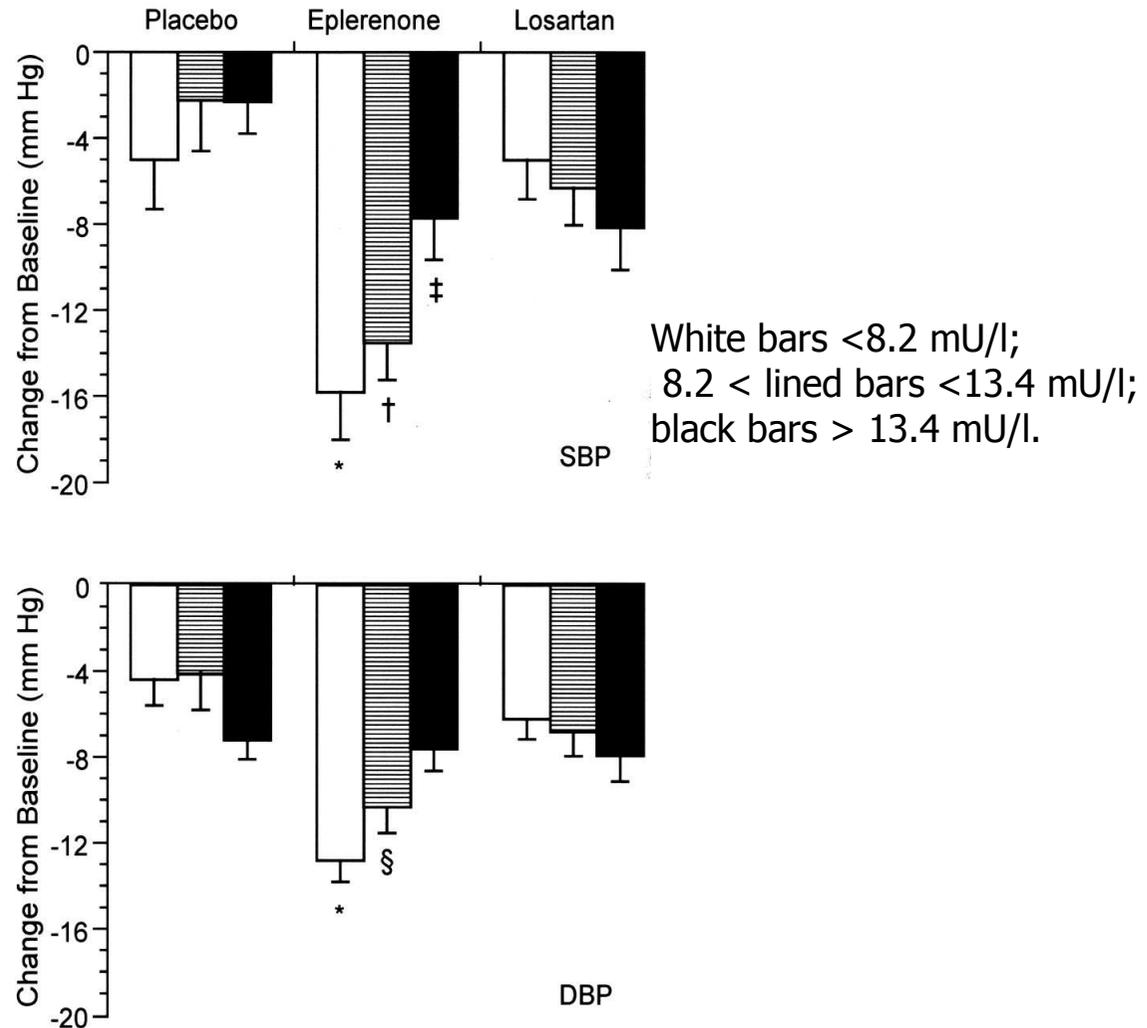
(Sareli, Arch Intern Med 2001, 161: 965-971)

Mean change from baseline for diastolic blood pressure (DBP) in (A) black patients and (B) white patients



*p 0.05, **p 0.01, ***p 0.001 for eplerenone versus placebo or losartan

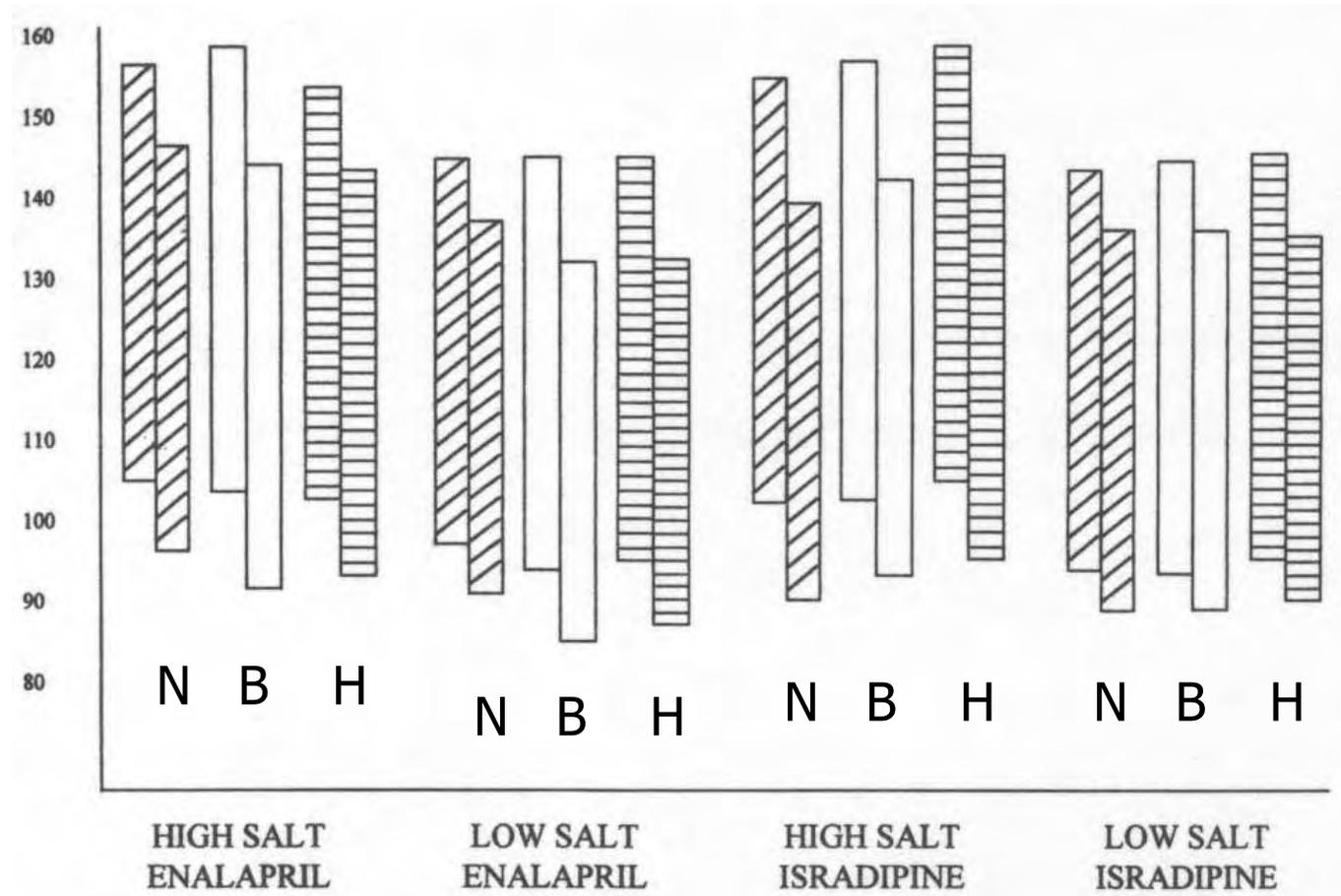
Changes in systolic blood pressure (SBP) and diastolic blood pressure (DBP) associated with treatment according to baseline level of active renin



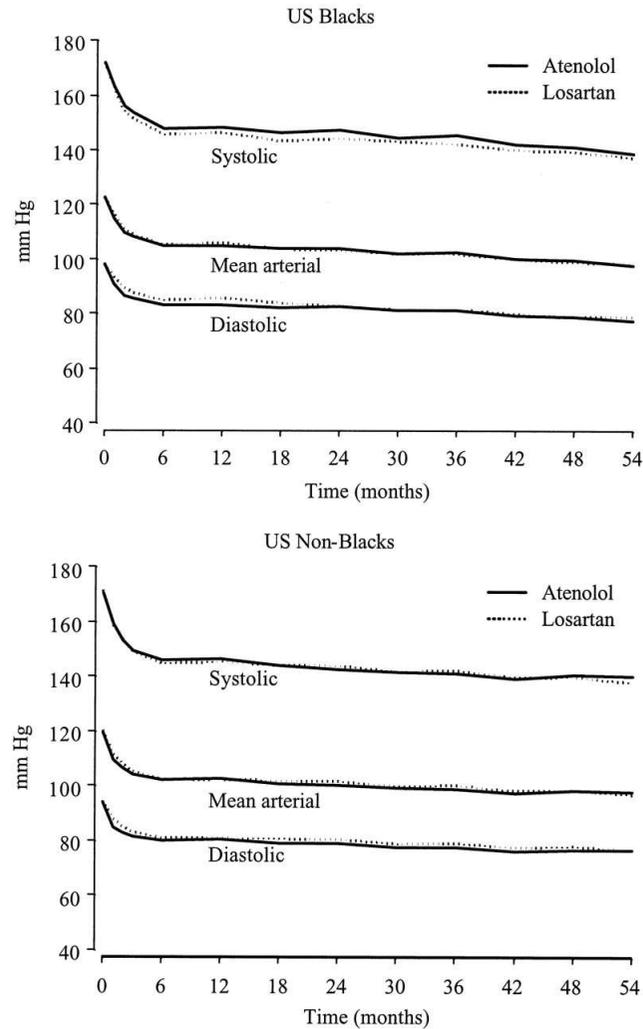
Flack, J. M. et al. J Am Coll Cardiol 2003;41:1148-1155

Comparaison de classes

La différence de réponse entre anticalcique et IECA est abolie par la restriction sodée.

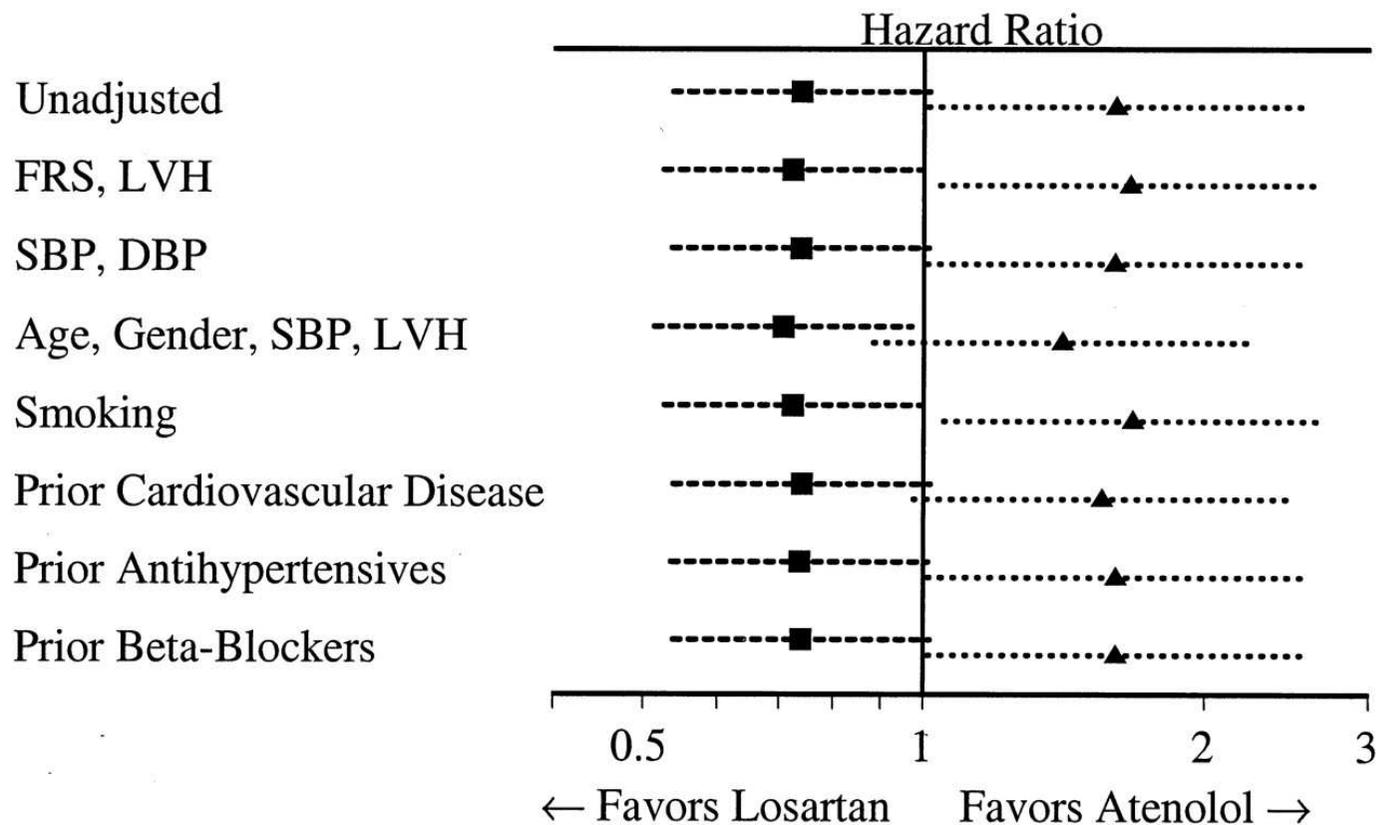


LIFE STUDY: Blood pressure results in the U.S.: blacks versus non-blacks

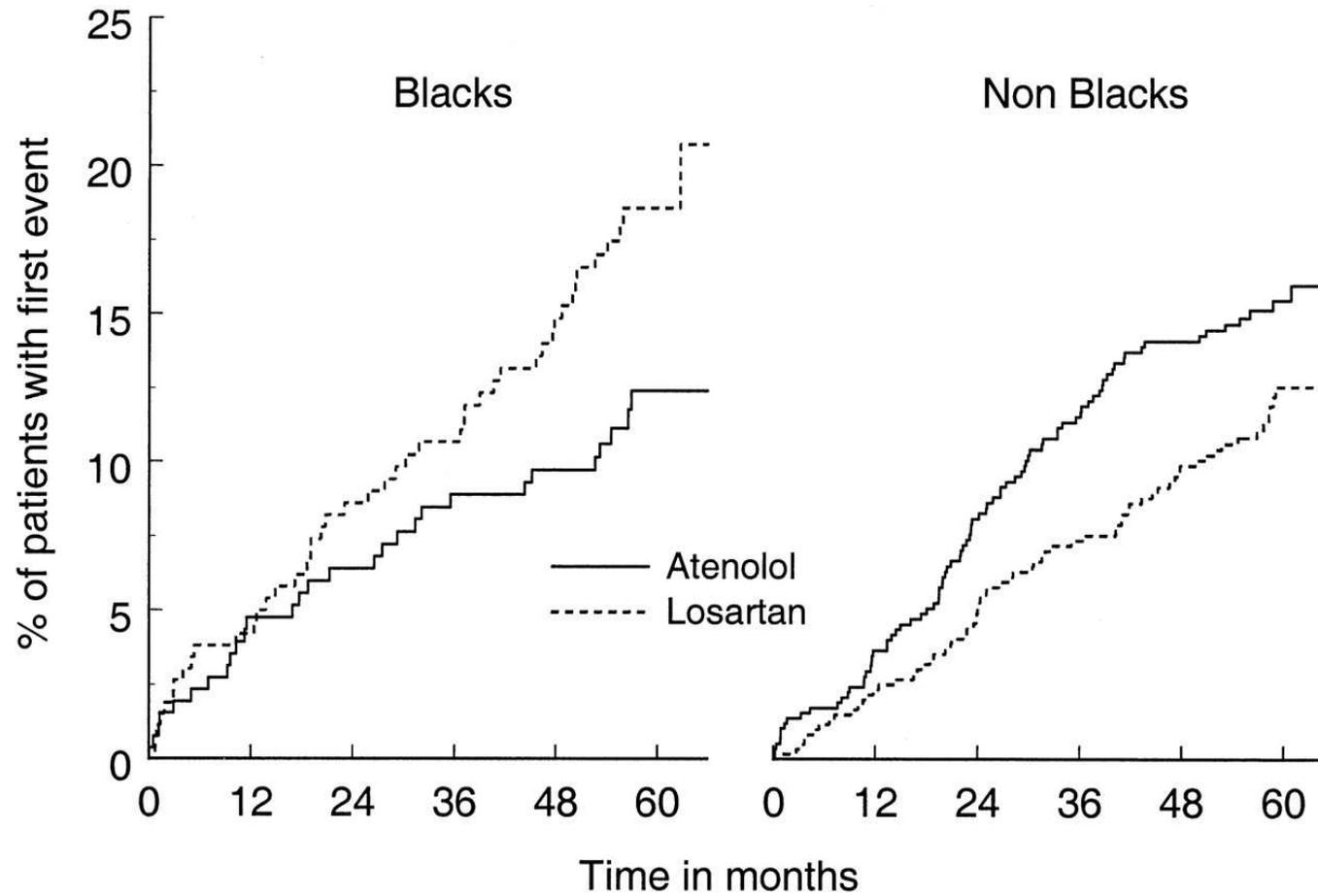


Julius, S. et al. J Am Coll Cardiol 2004;43:1047-1055

Primary composite end point: unadjusted and adjusted for baseline covariates in U.S. blacks (triangles) versus non-blacks (squares)



LIFE STUDY: Results of primary composite end point by ethnic group in the U.S.: blacks versus non-blacks



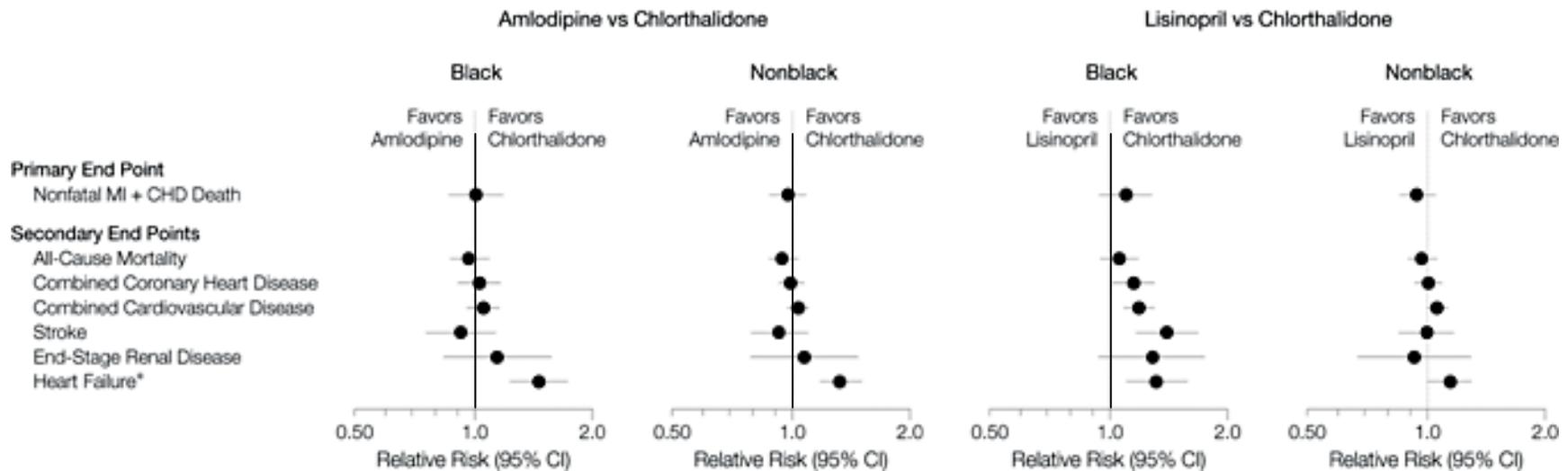
Julius, S. et al. J Am Coll Cardiol 2004;43:1047-1055

Cardiovascular risk: ALLHAT

Relative risks in Blacks (35%). Mean follow-up 4.9 years:

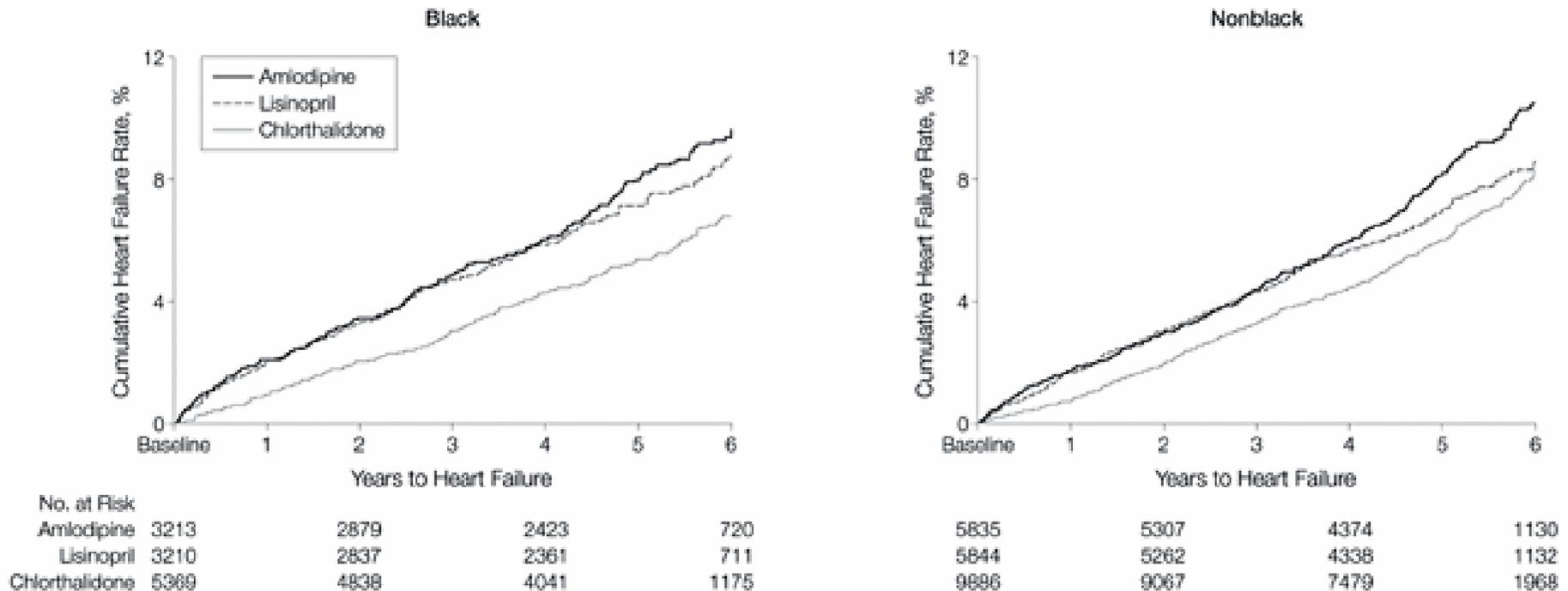
	Amlodipine vs Chlorthalidone (5639 vs 3213)	Lisinopril vs Chlorthalidone (5639 vs 3210)
Non fatal MI		
+ CHD death	1.01	1.10
All cause mortality	0.97	1.06
Stroke	0.93	1.40**#
Combined CHD	1.03	1.15*#
Combined CVD	1.06	1.19*#
Heart failure	1.47**	1.32**

ALLHAT



Relative Risks for Comparisons of Amlodipine vs Chlorthalidone and Lisinopril vs Chlorthalidone in Blacks and Nonblacks

ALLHAT Insuffisance cardiaque



Heart failure (HF) includes fatal, nonfatal hospitalized, and nonhospitalized treated. Relative risks (RRs) and 95% confidence intervals (CIs) for comparisons were as follows: blacks: amlodipine vs chlorthalidone: RR, 1.46 (95% CI, 1.24-1.73); lisinopril vs chlorthalidone: RR, 1.30 (95% CI, 1.10-1.54); nonblacks: amlodipine vs chlorthalidone: RR, 1.32 (95% CI, 1.17-1.49); lisinopril vs chlorthalidone: RR, 1.13 (95% CI, 1.00-1.28).

Protection rénale: AASK

African American Study of Kidney Disease and Hypertension

•Questions:

- Un contrôle PA agressif ralentit-il la décroissance de la fonction rénale?
- L'antihypertenseur initial modifie-t-il le pronostic rénal?

•Patients:

- Noirs américains non diabétiques
- Age 18-70 ans
- PAD \geq 95 mmHg
- DFG 20-65 ml/min

•Chronologie de l'étude:

- Pilote 1992-1994
- Complète 1995-2001

•Interventions

- Suivi 3,8 ans

Cible PA	Metoprolol 50-200 mg	Amlodipine 5-10 mg	Ramipril 2,5-10 mg
PA 140/90 (141/85)	20% (217)	10% (108)	20% (215)
PA 125/75 (128/78)	20% (224)	10% (109)	20% (221)
Total	441	217	436

Protection rénale: AASK

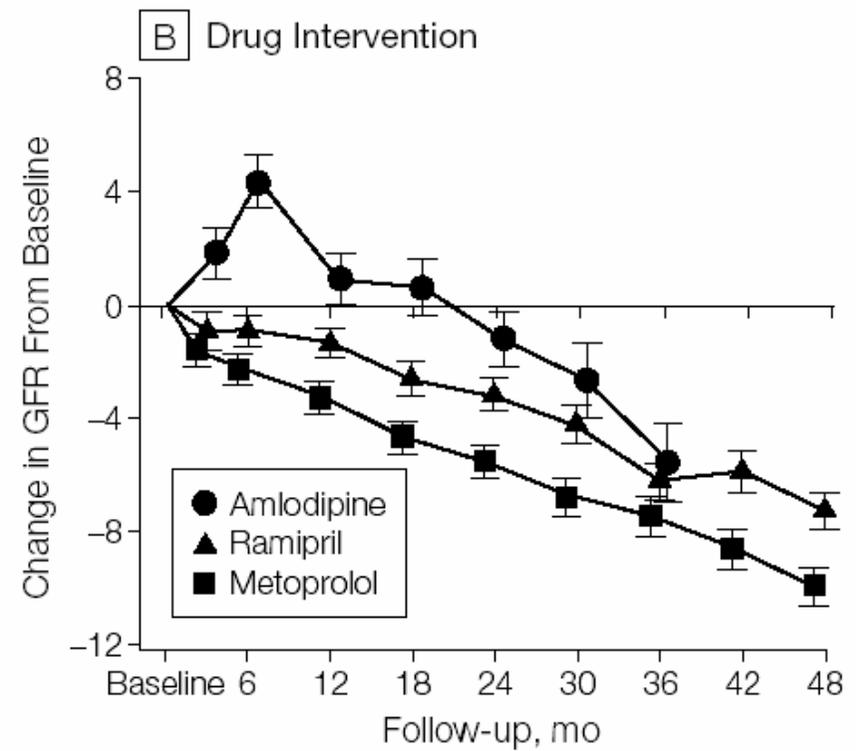
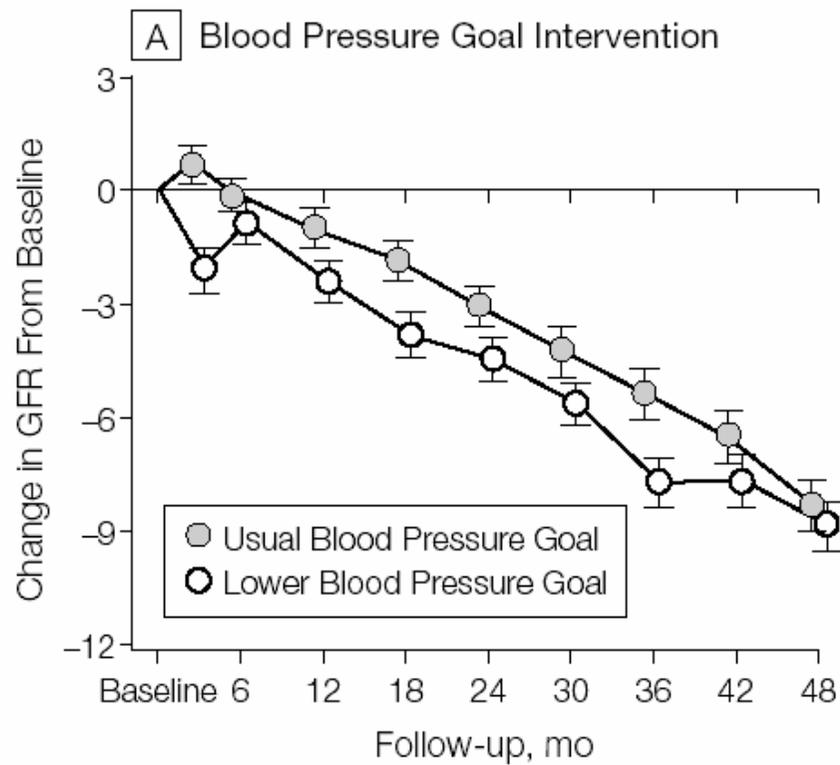
Caractéristiques initiales:

	Ramipril	Amlodipine	Metoprolol
Age	54.4±12.8	54.5±10.7	54.9±10.4
% Femmes	38.5	39.6	38.6
PAS (mmHg)	151±23	150±25	150±24
PAD (mmHg)	96±15	96±14	95±14
DFG (ml/min)	45.4±12.8	45.8±12.8	45.9±13.4

Traitements associés: diurétiques (62%), IECA (38%), β-bloquants (28%), ICa (63%)

Protection rénale: AASK

Résultats:

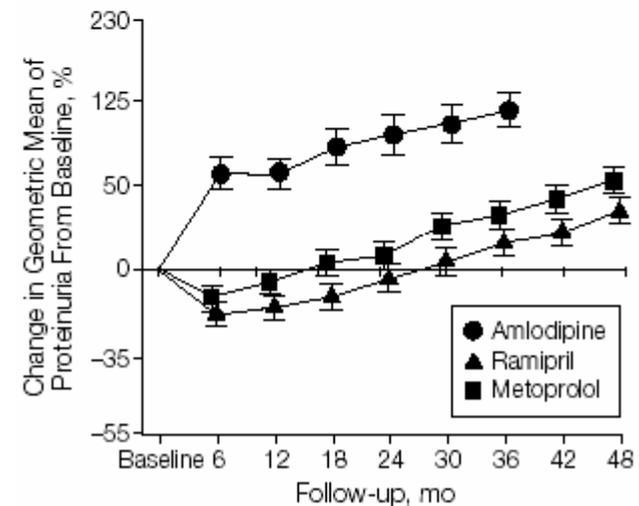
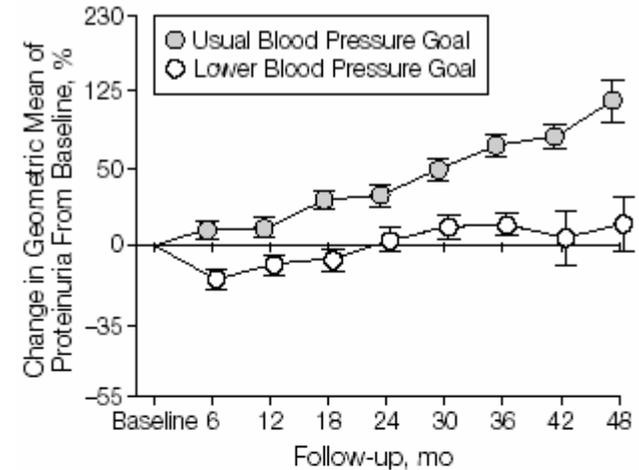


Protection rénale: AASK

Résultats (%RR):

	⚡ DFG*, IRCT, décès	P
Low vs Usual BP	2	0.85
Ramipril vs Metoprolol	22	0.04
Metoprolol vs Amlodipine	20	0.17
Ramipril vs Amlodipine	38	0.004

* ⚡ DFG 50% ou 25 ml/min



Conclusions

- Epidémiologie
 - L'HTA est plus fréquente mais très dépendante de l'environnement
- Physiopathologie
 - La réactivité vasculaire aux stimuli vasoconstricteurs est augmentée Activité CoT
Na, K, 2 Cl
 - HTA rénine basse
- Risques
 - Le risque coronarien accru?
 - Le risque d'AVC est accru?
 - Le risque d'IRC est accru surtout pour les hypertensions modérées
- Traitement
 - La normalisation du poids et de l'apport sodé est essentielle
 - Un contrôle tensionnel satisfaisant peut être obtenu
 - Ica et Diurétiques assurent les baissent tensionnelles les plus élevées
 - Les IECA assurent une protection rénale significative

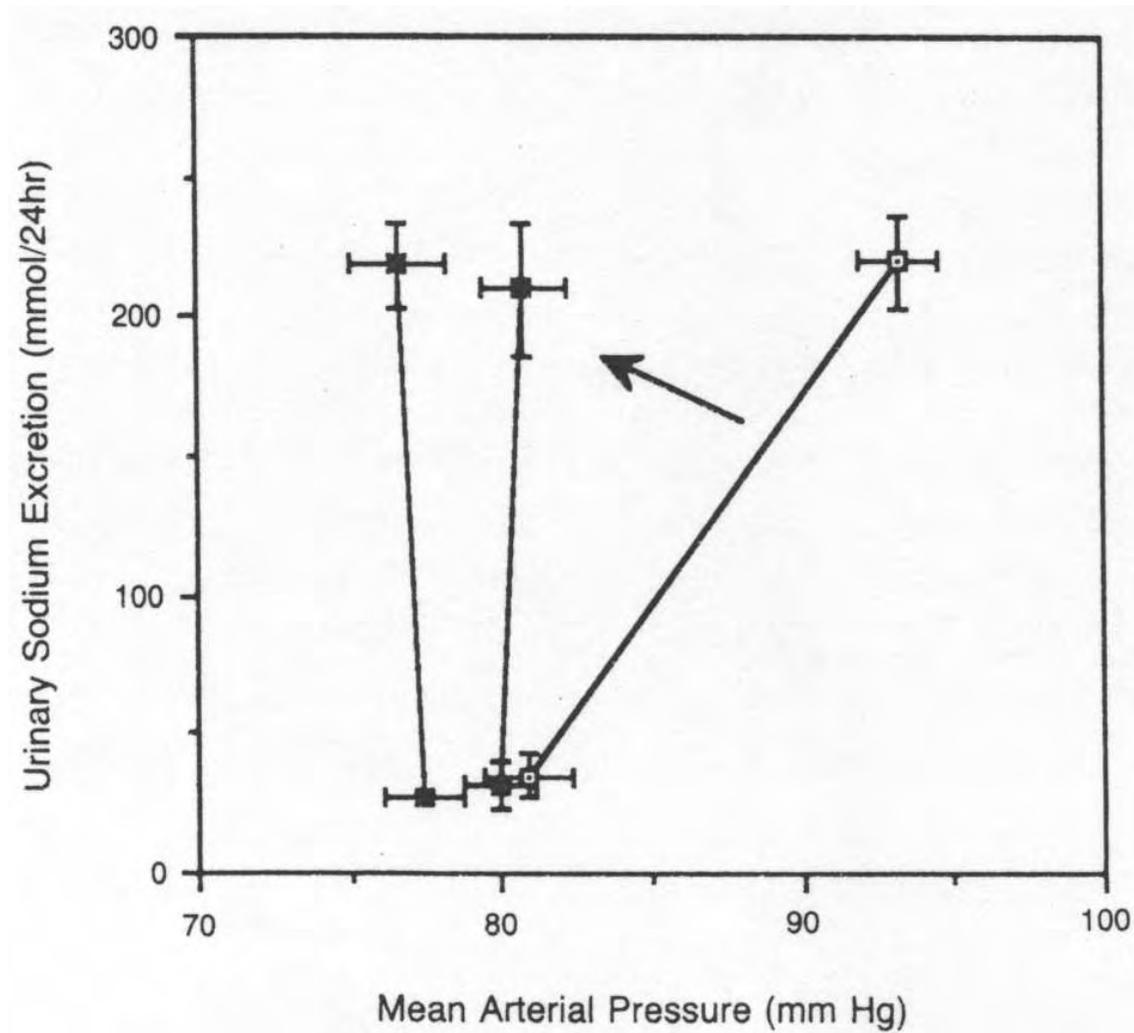
Causes de décès

Autopsies systématiques de sujets décédés de cause cardiovasculaire (NYC, 1991): n=587.

	Blancs (n=273)	Noirs (314)
Age de décès (ans)		
- hommes	51.2	51.7
- femmes	61.5	54.7*
Cause de décès		
Athérome coronaire (%)	64	38
Hypertension (%) (HVG, ICC, AVC, NHT,...)	23	42

(Onwuanyi, Hypertension 1998, 31: 1070-76)

Excès pondéral (interventions)



*(Rocchini,
NEJM 1989)*

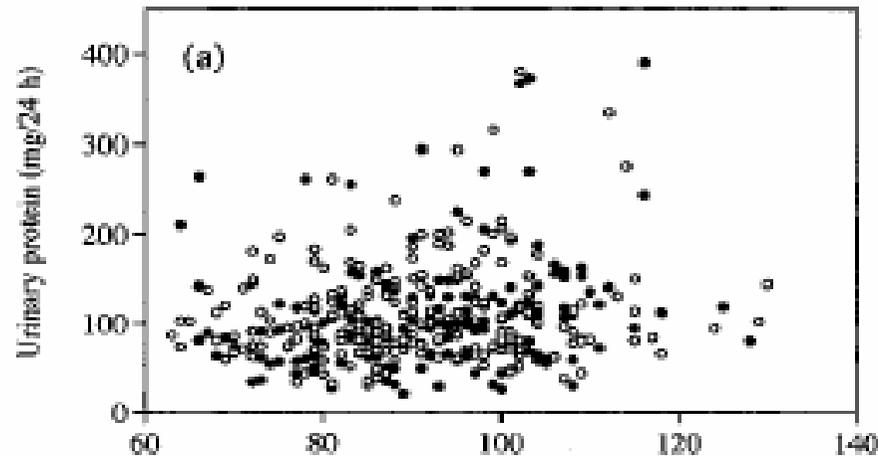
Epidémiologie de l'IRC: NHANES III (1988-94)

	Blancs		Noirs	
	H	F	H	F
Tous âges				
PCr > 15 mg/l*	9%	1.87%	21.94%	2.87%
PCr > 20 mg/l	0.43%	0.23%	1.47%	0.63%
IRCT (pmh)	171		512	
<i>HTA (age adj.)</i>	23.3%		32.4%	
<i>RR diabète</i>	1		1.5 - 3	

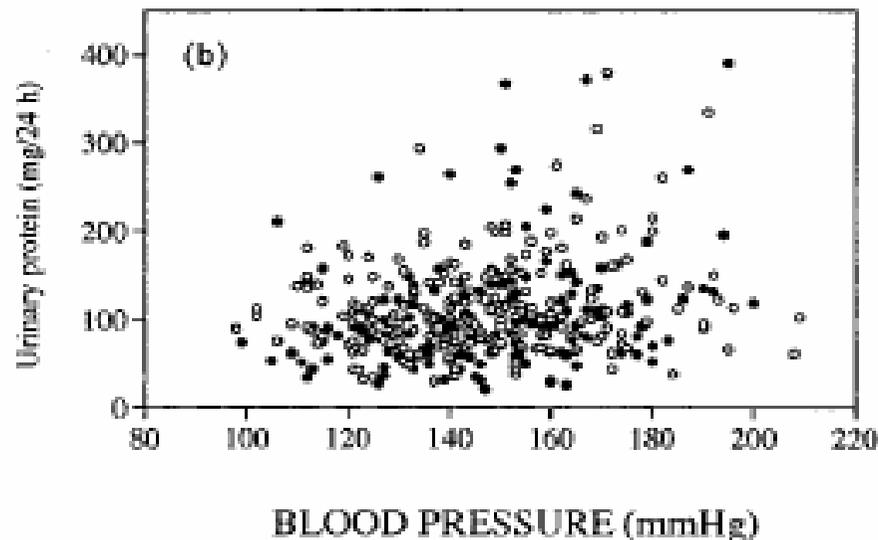
(* = Ccr 50 ml/min pour 60 ans, 70 kg)

(Jones, AJKD 1998, 32:992-9)

NHT débutante: protéinurie



Valeurs individuelles de la protéinurie de 24 h selon la PAS et la PAD chez des sujets Blancs (o) et Noirs (●) vivant à Londres.



(Chelliah, *Hypertension* 2002, 39:1064-1070)

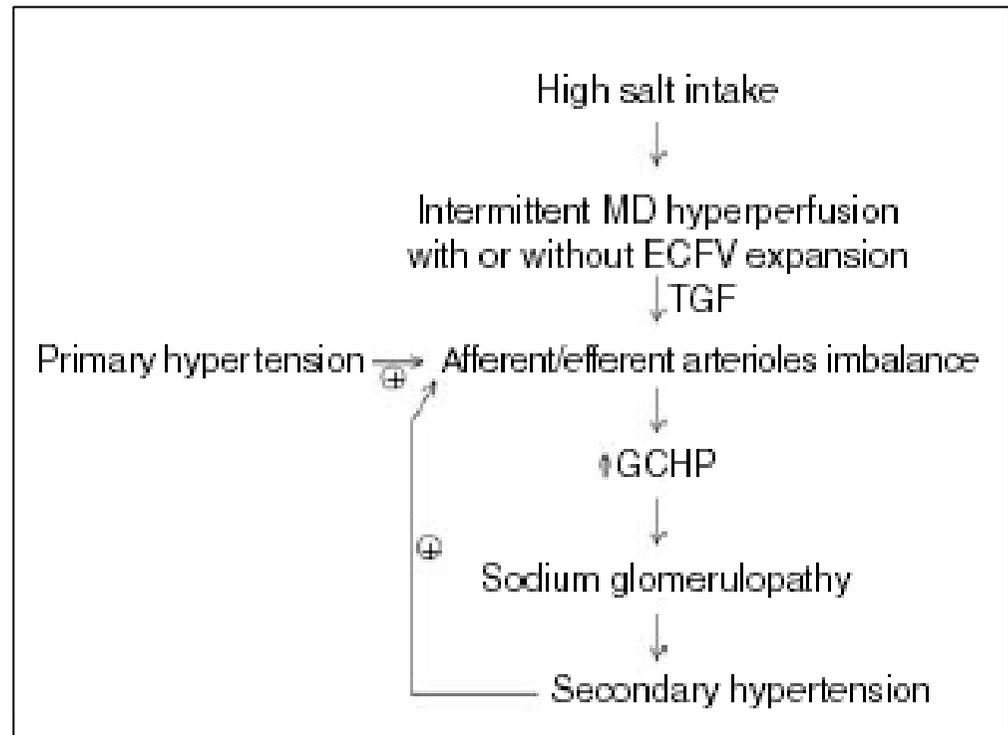
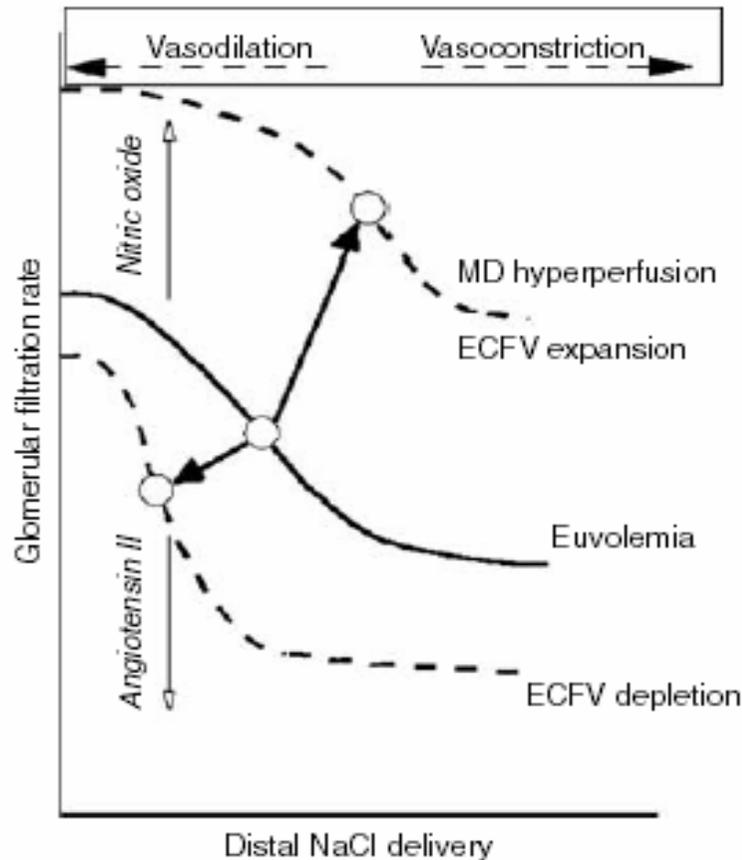
Fonction rénale: HTA récente

Comparaison des index de TOD chez 145 hypertendus :

	Noirs	Blancs
	(n=82)	(n=63)
Microalbumine (mg/j)	25	12*
Cl. inuline (ml/min/1.73)	183	131*
Cl. Lithium (mmol/min)	22	33*

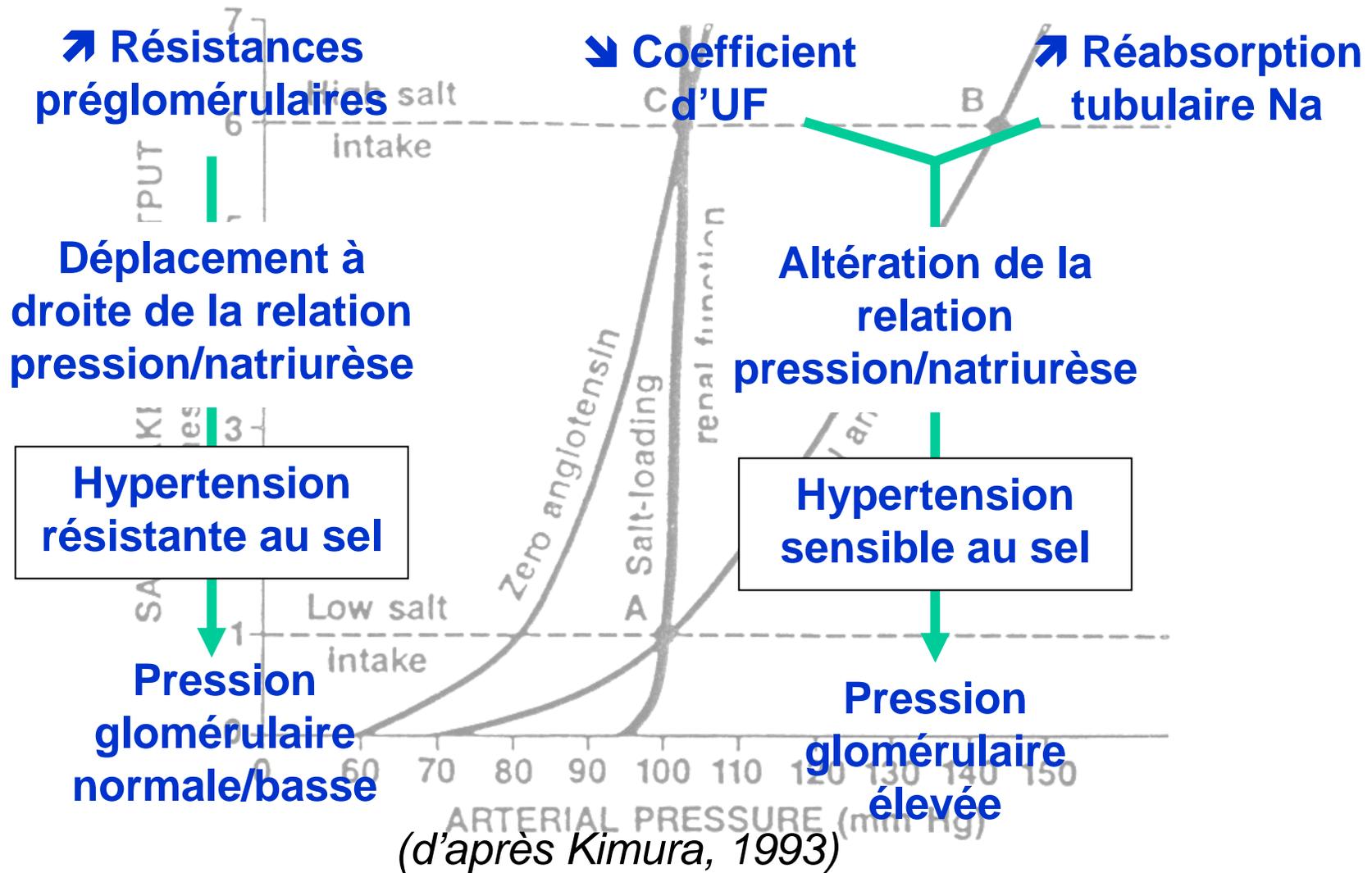
(El-Gharbawy, Hypertension 2001, 38:761-66)

Sodium et fonction glomérulaire



(Aviv A, KI 2004, 65, 361-8)

Glomérule & sensibilité au sel



Génétique: angiotensinogène

An association study of angiotensinogen polymorphisms with serum level and hypertension in an African-American population

Xiaodong Wu^a, Amy Luke^a, Mark Rieder^b, Kwok Lee^b, Emily J. Toth^b, Deborah Nickerson^b, Xiaofeng Zhu^a, Donghui Kan^a and Richard S. Cooper^a

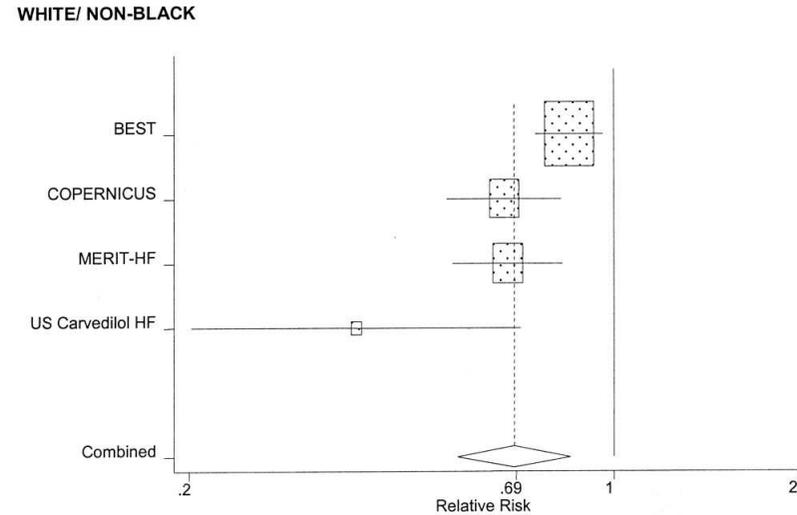
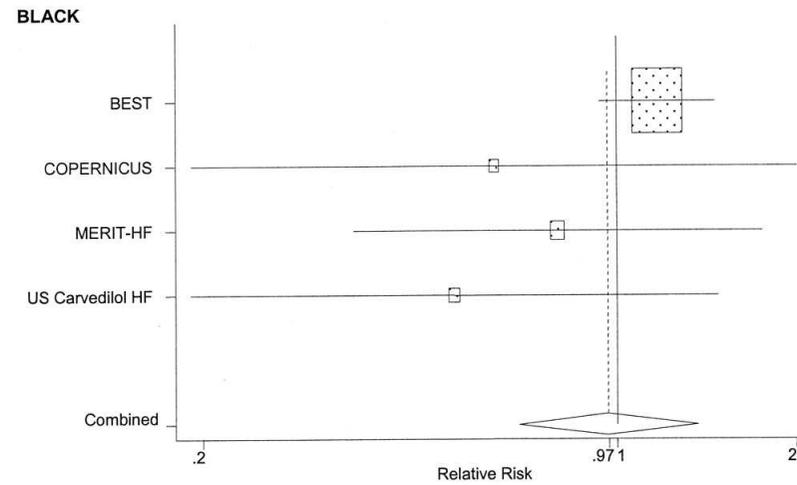
Journal of Hypertension 2003, 21:1847–1852

Results No significant association with AGT level or hypertension was found in analyses of each of the five single SNPs. However, one of the haplotypes defined by these five SNPs was significantly associated with AGT level ($P = 0.046$), although this haplotype was not associated with hypertension.

Effect of ACE Inhibitors on Mortality From Heart Failure in Black and White Patients

Study Name	Total N	White N	Non-White N	Black N	Non-Black N	RR White (95% CI)	RR Black (95% CI)	RRR (95% CI)
SAVE	2,231	1,993	238			0.84 (0.71–0.99)	0.78 (0.50–1.21)	1.08 (0.67–1.73)
SOLVD-Prevention	4,228	3,657	571	404	3,824	0.95 (0.81–1.12)	0.87 (0.60–1.25)	0.91 (0.61–1.36)
SOLVD-Treatment	2,569	2,061	508	396	2,173	0.89 (0.79–1.00)	0.93 (0.74–1.17)	1.04 (0.81–1.35)
Random effects pooled estimate		7,711	1,317	800	5,997	0.89 (0.82–0.97)	0.89 (0.74–1.06)	1.01 (0.83–1.24)

Effect of beta-blockers on mortality in patients with heart failure



Hémodynamique rénale

Réponse du FPR au
captopril chez 144
adultes normotendus
Noirs (32) ou
Caucasiens (82).

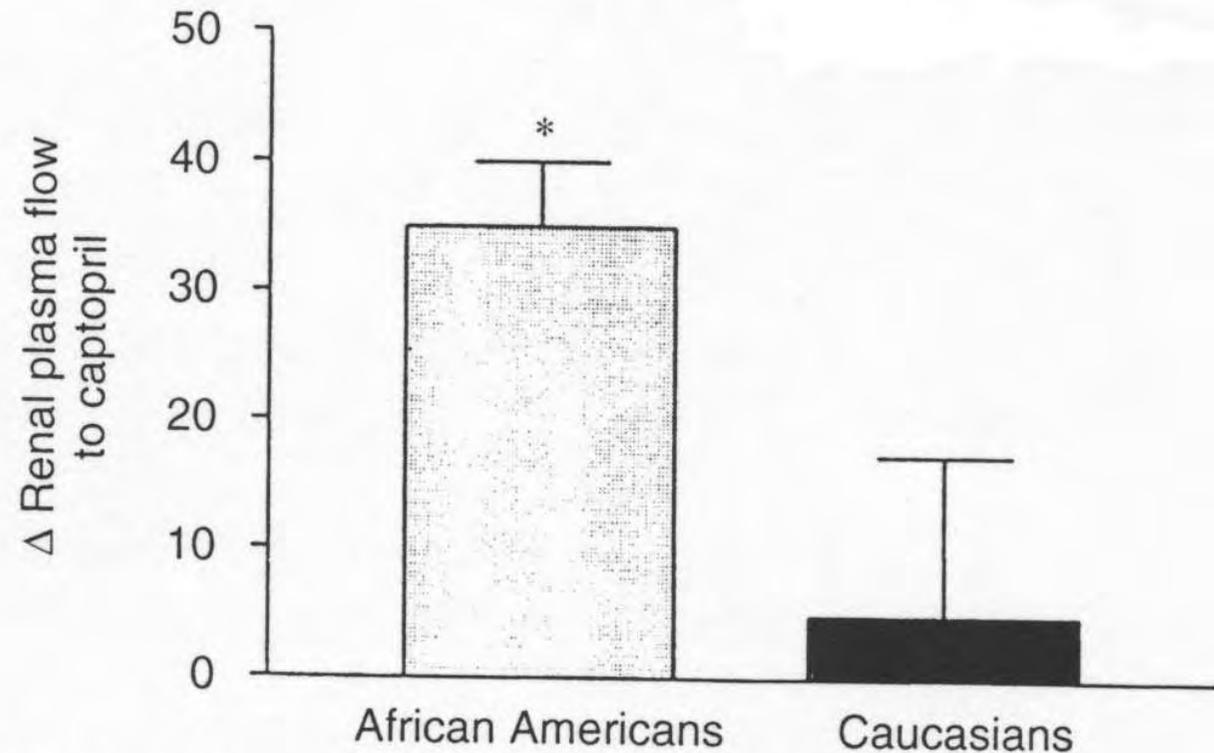


Fig. 2. Renal vascular response to angiotensin-converting enzyme (ACE) inhibition with captopril in healthy African Americans (▨) and whites (■; $P < 0.028$ blacks vs. whites).

(Price, Kidney Int 2001, 59:1037-43)

ALLHAT

Table 4. Serious Adverse Events by Race*

	Black			Nonblack		
	Chlorthalidone	Amlodipine	Lisinopril	Chlorthalidone	Amlodipine	Lisinopril
No. of participants randomized	5369	3213	3210	9886	5835	5844
Total adverse events, No. (No. per 1000 participants)	38 (0.71)	20 (0.62)	57 (1.78)	116 (1.17)	41 (0.70)	75 (1.28)
Adverse events by body system, No. (% of participants)						
Circulatory	14 (0.26)	9 (0.28)	15 (0.47)	45 (0.46)	12 (0.21)	26 (0.44)
Genitourinary	2 (0.04)	0	3 (0.09)	8 (0.08)	8 (0.14)	5 (0.09)
Musculoskeletal	0	1 (0.03)	0	4 (0.04)	1 (0.02)	0
Nervous system and sense organs	4 (0.07)	3 (0.09)	3 (0.09)	14 (0.14)	3 (0.05)	5 (0.09)
Respiratory	2 (0.04)	0	5 (0.16)	9 (0.09)	3 (0.05)	8 (0.14)
Angioedema, No. (% of participants)	2 (0.04)	2 (0.06)	23 (0.72)	6 (0.06)	1 (0.02)	18 (0.31)
Total participants with adverse events, No. (%)	30 (0.56)	16 (0.50)	46 (1.43)	88 (0.89)	29 (0.50)	56 (0.96)

*All rows present numbers of events except for the last row, which present numbers of participants; thus, an individual can appear in more than 1 category or more than once in the same category.

ALLHAT

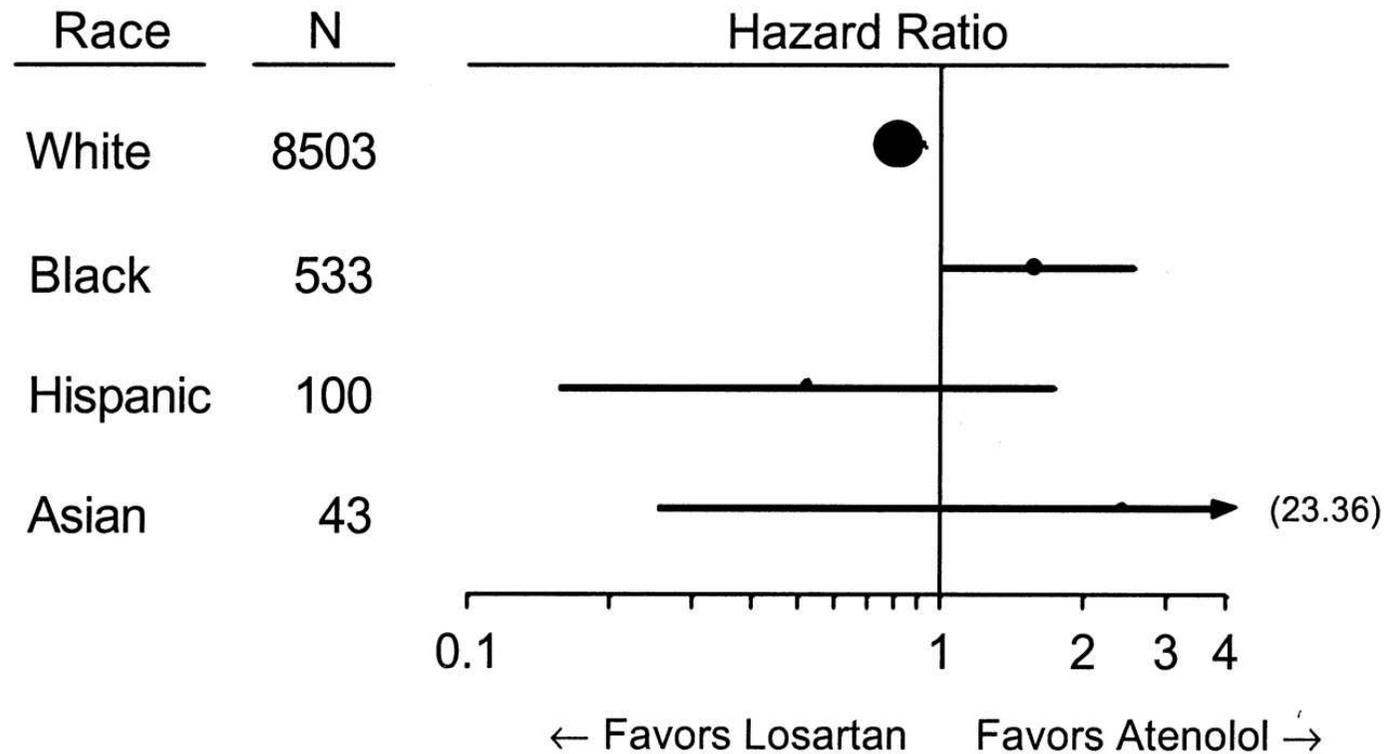
Table 7. Clinical Outcomes by Antihypertensive Treatment Group vs Chlorthalidone After Time-Dependent Blood Pressure Adjustment

Outcome	RR (95% CI)			
	Black		Nonblack	
	Amlodipine	Lisinopril	Amlodipine	Lisinopril
CHD	0.99 (0.82-1.19)	1.07 (0.90-1.28)	0.95 (0.85-1.08)	0.93 (0.83-1.05)
Mortality	0.97 (0.85-1.10)	1.07 (0.94-1.21)	0.92 (0.83-1.02)	0.96 (0.87-1.06)
Stroke	0.91 (0.72-1.15)	1.36 (1.10-1.68)	0.91 (0.76-1.10)	0.97 (0.81-1.17)
Combined CVD	1.03 (0.93-1.15)	1.17 (1.05-1.29)	1.01 (0.94-1.08)	1.04 (0.97-1.12)
Heart failure*				
First year	2.85 (1.75-4.66)	2.47 (1.49-4.10)	2.49 (1.68-3.68)	2.14 (1.43-3.20)
Beyond first year	1.23 (0.99-1.52)	1.13 (0.90-1.41)	1.16 (1.00-1.35)	1.01 (0.87-1.19)

Abbreviations: CI, confidence interval; CHD, coronary heart disease; CVD, cardiovascular disease; RR, relative risk.

*The proportional hazards assumption was violated for the heart failure outcome.

LIFE STUDY Results of primary composite end point by ethnic group



Julius, S. et al. J Am Coll Cardiol 2004;43:1047-1055

Diagnostic de NHT : étude AASK

Phase pilote : hypertendus (PAD \geq 95 mmHg)
Noirs Américains, âge 18 - 70 ans,
DFG 25 - 70 ml/min/1.73 m², protéinurie \leq 2 g/24 h.

Biopsies rénales initiales :

- screenés	88
- biopsie adéquate	39
- arterio / arteriolosclérose	38
- glomérulosclérose segmentaire	5
- glomérulosclérose globale	43 \pm 26 % glomérules

Corrélations avec la glomérulosclérose globale :

- PAS	p = 0.017
- cholestérol	p = 0.013
- créatinine	p = 0.0009

mais ni âge ni protéinurie

(Fogo A et al.. Kidney Int 1997. 51. 244-252)