



# Acupuncture et traitement de l'hypertension une méta-analyse



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# The very beginning...

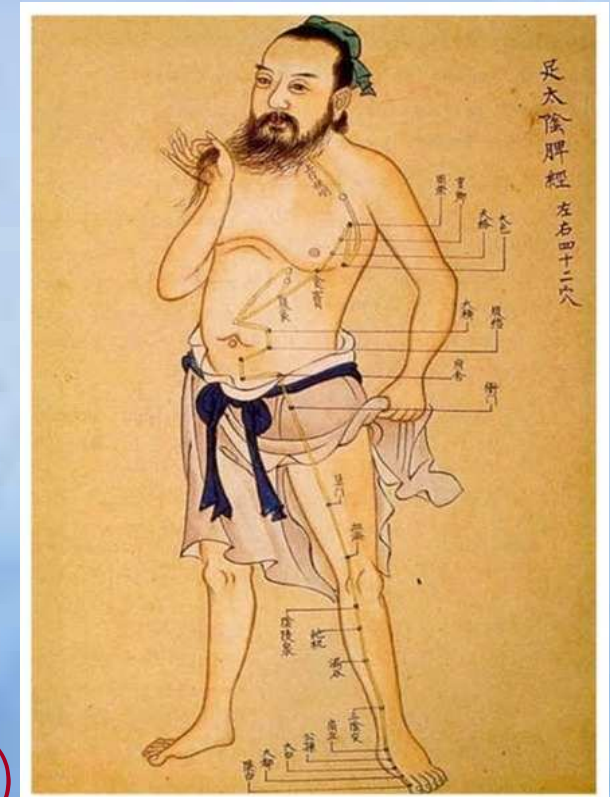




# Introduction

## Acupuncture effets rapportés:

1. Excitation des fibres somatiques afférentes provoquant une inhibition du système sympathique cérébral
2. changement de taux d'hormone régulant la tension (endothélin-1, renine, aldostérone et angiotensine II)



# Question?

Estimer l'effet de  
l'acuponcture sur la tension  
artérielle chez sujets  
hypertendus.



# Méthodes



# Critères d'inclusions

## Études sélectionnées :

- 6 bases de données électroniques et 3 journaux (medline, embase, chochrane ,...)
- Études parues jusqu'en juin 2007
- Mots clés : « acuponcture, électroacuponcture, acuponcture auriculaire, tension artérielle, hypertension »
- Essais randomisés contrôlés
- Hypertension = TAS  $\geq$ 140mmHg ou TAD  $\geq$ 90mmHg
- Traitement : acuponcture, électroacuponcture, acuponcture auriculaire
- Etudes démontrant un changement de TA





# Outcome

Changement de la tension artérielle systolique et/ou diastolique

Analyse de données :

Association entre changement de valeurs de TA et :

- 1) Qualité de l'étude (Modified Oxford Scale)
- 2) Type de contrôles (Ø traitement, ttt HTA)
- 3) Pays de réalisation
- 4) Méthode d'acuponcture



# Modified Oxford Scale

Score de qualité méthodologique des études incluses selon:

- Randomisation oui-non (1pt)
- Qualité de la randomisation (1pt)
- Intervention simple/double aveugle (1-2pt)
- Description des patients (1pt)

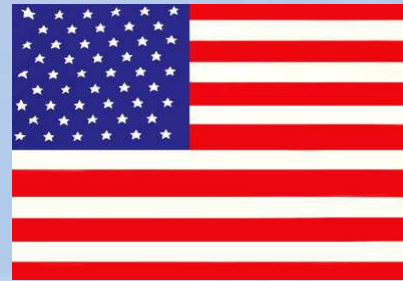
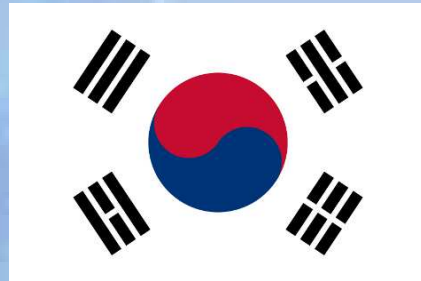
Score max. 5



# Résultats



# Etudes internationaux

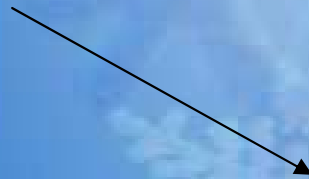


7

1

1

2



11/112 études incluses pour review














3 études incluses pour méta-analyse



## Caractéristiques de base – quelques chiffres..

- 847 patients → 468 acupuncture vs. 379 contrôles
- Âge moyenne: 56ans
- Tension artérielle moyenne: 158/94mmHg
- Traitement anti-hypertenseur chez sujets acupuncture: 21%
- Follow-up (tensionnel): 1 semaines – 12 mois
- Acupuncture: 15-30min., 17 séances, pendant 5 semaines
- Contrôles:
  - SHAM acupuncture (4)
  - Traitement antihypertenseur (6)
  - Pas de traitement (1)
- Oxford-Scale: 5pts (2), 4pts (1), 3pts (1), 2pts (2), 1pt (5)



Author	Country	Mean age (Acu/Con)	Quality <sup>a</sup>	Style	Acu				Baseline BP <sup>c</sup>	Type	Con		Comments
					No. of session	Duration (wk)	No. of patients (drug% <sup>b</sup> )	No. of patients (drug% <sup>b</sup> )			Baseline BP <sup>c</sup>		
Flachskampf <sup>10</sup>	Germany 	59/58	4	IND	22	6	83 (=78)	131/81	Sham: identical needling at nonacupoints	77 (=78)	129/80	F/u: 3 and 6 mo	
Yin <sup>21</sup>	South Korea 	52/54	5	IND	17	8	21 (100)	137/84	Sham: nonpenetrating sham needles at the same acupoints	20 (100)	133/82	Co: breathing and easy-walking exercise for both groups	
Macklin <sup>11</sup>	United States 	57/56/53	5	IND/STD	12	5-9.3	64/64 (0/0)	150/93, 150/93	Sham: superficial needling at nonacupoints without manipulation	64 (0)	148/94	F/u: every 2 to 10 wk and 4, 6, 9 and 12 mo	
Jin <sup>16</sup>	China 	72/69	1	STD	5	1	30 (100)	169/84	Tailored antihypertensive drugs	30 (100)	165/83	Acupuncture group also received tailored antihypertensive drugs.	
Wang <sup>17</sup>	China 	55/52	2	STD	28	4	30 (0)	170/104	Metoprolol 10 mg (per day)	30 (100)	174/105		
Jiang <sup>4</sup>	China 	57/58	1	STD with MNA	18	3	30 (100)	159/92	Captopril 12.5-25 mg (t.i.d.)	30 (100)	157/94	Acupuncture group also received captopril.	
Zhao <sup>23</sup>	China 	40/46	2	STD	30	5.7	30 (0)	164/96	Lifestyle intervention	30 (0)	161/98	Acupuncture group also received lifestyle intervention	
Chen <sup>18</sup>	China 	64/65	1	STD	14	2	35 (0)	166/87	Nifedipine 10-20 mg (t.i.d.)	35 (100)	164/90		
Kraft <sup>20</sup>	Germany 	50	3	STD	12	6 wk × 2 cycles	7 (0)	148/94 <sup>d</sup>	Sham: superficial needling at nonacupoints, deqi elicited	7 (0)	150/94 <sup>d</sup>		
Yin <sup>22</sup>	China 	ND	1	STD	21	6	48 (0)	171/107	Reserpine 1-2 tablets (t.i.d.)	30 (100)	168/106	F/u: 2 wk	
Dan <sup>19</sup>	China 	58/58	1	IND	15	3	26 (0)	149/95	Nifedipine 10 mg (t.i.d.)	26 (100)	147/95		

Acu, acupuncture; BP, blood pressure; Co, co-intervention; Con, control; DBP, diastolic blood pressure; F/u, follow-up; IND, individualized acupuncture; MNA, magnetic needle acupuncture; mo, months; ND, no data reported; SA, sham acupuncture; SBP, systolic blood pressure; STD, standardized acupuncture; wk, week; t.i.d., three times a day.

<sup>a</sup>Modified Oxford scale. <sup>b</sup>Percentage of patients on antihypertensive drugs. <sup>c</sup>Mean SBP/DBP. <sup>d</sup>Median.



Type of Control	Author	Outcomes	Intergroup difference	ΔSBP		ΔDBP	
				Acupuncture Mean (95% CI)	Control Mean (95% CI)	Acupuncture Mean (95% CI)	Control Mean (95% CI)
Acu plus Med vs. Sham Acu plus Med	Flachskampf <sup>10</sup>	1. 24-h BP at 6 wk	1. SBP, DBP: each $P < 0.001$	1. -5 (-8, -3)	1. 2 (0, 4)	1. -3 (-5, -2)	1. 1 (-1, 3)
		2. Daytime BP at 6 wk	2. SBP, DBP: each $P < 0.001$	2. -7 (-9, -4)	2. 2 (-1, 4)	2. -4 (-5, -2)	2. 1 (-1, 2)
		3. Nighttime BP at 6 wk	3. SBP: $P = 0.049$ ; DBP: $P = 0.14$	3. -3 (-6, 0)	3. 0 (-3, 2)	3. -1 (-3, 1)	3. 1 (-1, 3)
		4. Peak exercise <sup>a</sup> BP at 6 wk	4. SBP, DBP: each $P > 0.05$	4. -5 (-11, 2)	4. -1 (-7, 6)	4. -1 (-4, 2)	4. -1 (-6, 3)
Acu vs. Sham Acu	Yin <sup>21</sup>	BP at 8 wk	SBP: $P = 0.013$ ; DBP: $P = 0.049$	-15 (-20, -9)	-4 (-11, 3)	-7 (-11, -3)	-1 (-6, 4)
	Macklin <sup>11</sup> Kraft <sup>20,b</sup>	BP at 10 wk	SBP: $P = 0.90$ ; DBP: $P = 0.16$	-4 (-7, 0)	-4 (-8, 0)	-4 (-6, -2)	-3 (-5, -1)
Acu plus Med vs. Med	Jin <sup>16</sup>	1. BP at 10 wk	1. SBP, DBP: each $P > 0.05$				
		2. 24-h BP at 10 wk	2. SBP, DBP: each $P > 0.05$				
		3. Daytime BP at 10 wk	3. SBP, DBP: each $P > 0.05$				
		4. Nighttime BP at 10 wk	4. SBP, DBP: each $P > 0.05$				
Acu vs. Med	Wang <sup>17</sup>	1. BP at 1 wk	1. SBP, DBP: each $P > 0.05$	1. -3			8 (NA)
		2. Global symptom changes	2. $P < 0.05$				
		3. Headache, vertigo and insomnia	3. Each $P < 0.05$				
		4. BP at 3 wk	SBP, DBP: each $P > 0.05$	-21 (NA)	-12 (NA)	-16 (NA)	-9 (NA)
Acu vs. Med	Chen <sup>18</sup> Yin <sup>22</sup> Dan <sup>19</sup>	1. BP at 4 wk	1. SBP, DBP: each $P > 0.05$	1. -7 (-9, -4)	1. -7 (-9, -5)	1. -14 (-15, -13)	1. -12 (-14, -11)
		2. Improvement of symptoms	2. $P < 0.05$				
		3. Headache, vertigo and agitation	3. Each $P < 0.05$				
		4. Tinnitus and insomnia	4. Each $P > 0.05$				
		5. Serum TNF-α	5. $P < 0.05$				
		6. Plasma ET	6. $P > 0.05$				
Acu vs. no treatment	Zhao <sup>23</sup>	BP at 2 wk	SBP: $P < 0.05$ ; DBP: $P > 0.05$	-30			5 (NA)
		BP at 6 wk	SBP, DBP: each $P > 0.05$	-35			4 (NA)
		1. 24-h BP at 3 wk	1. SBP, DBP: each $P > 0.05$	1. -2			-11 (NA)
		2. Myocardial oxygen consumption (SBP × HR)	2. $P < 0.01$				
		3. Symptom relieving	3. $P < 0.05$				
Acu vs. no treatment	Zhao <sup>23</sup>	1. BP at 5.7 wk	SBP: $P < 0.05$ ; DBP: $P > 0.05$	1. -35 (NA)	1. -22 (NA)	1. -15 (NA)	1. -10 (NA)
		2. Fasting insulin	2. $P < 0.05$				
		3. Insulin sensitivity index	3. $P < 0.05$				
		4. Body mass index	4. $P < 0.01$				
		5. Waist hip ratio	5. $P < 0.01$				

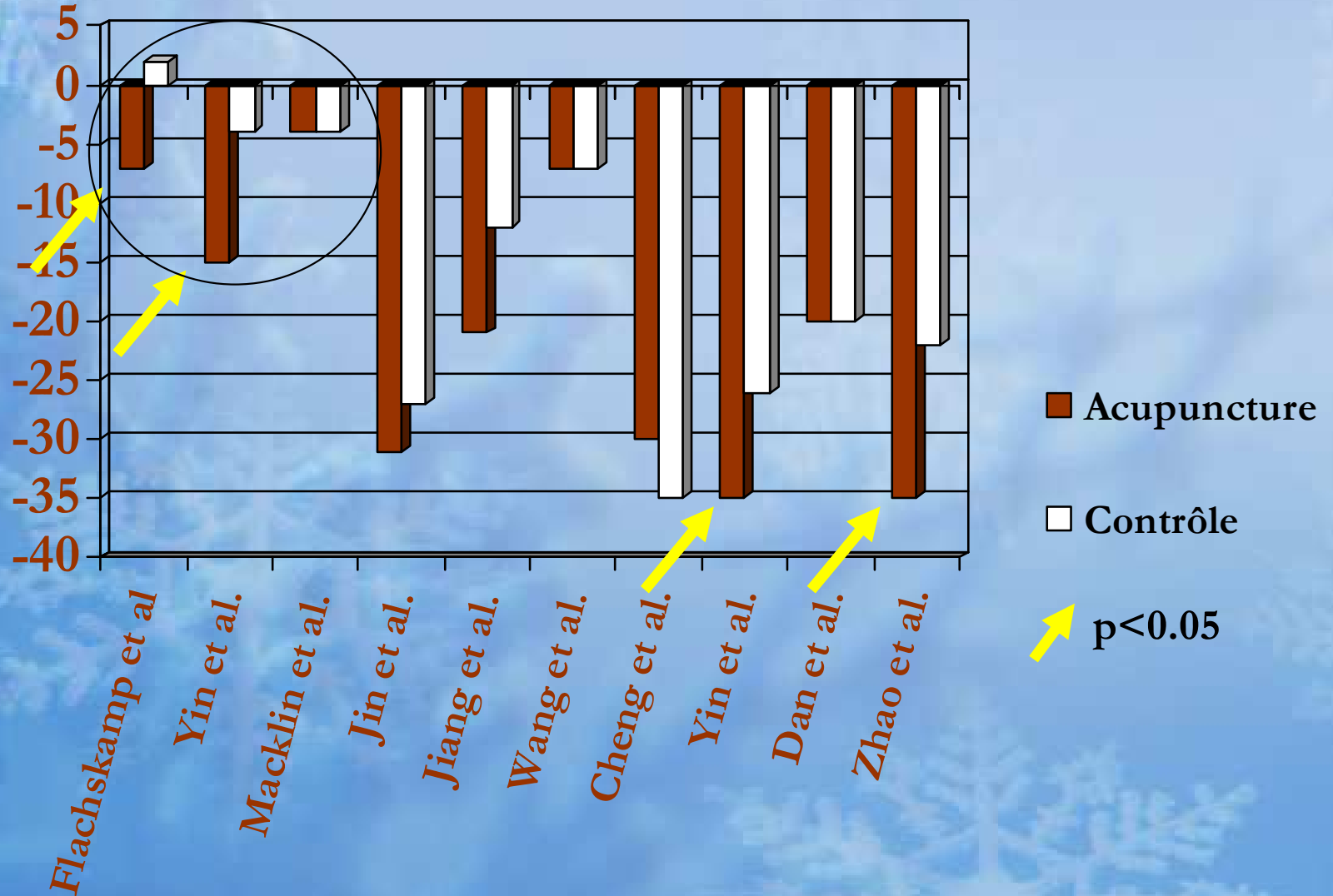


Acu, acupuncture; BP, blood pressure; DBP, diastolic blood pressure; ET, endothelin; HR, heart rate; IND, individualized acupuncture; Med, antihypertensive drugs; mo, months; NA, not applicable (data not available); SA, sham acupuncture; SBP, systolic blood pressure; STD, standardized acupuncture; wk, week.  
<sup>a</sup>Exercise at the maximal comparable workload. <sup>b</sup>The data of BP changes were not available.



# Outcome

$\Delta$  mmHg systolique



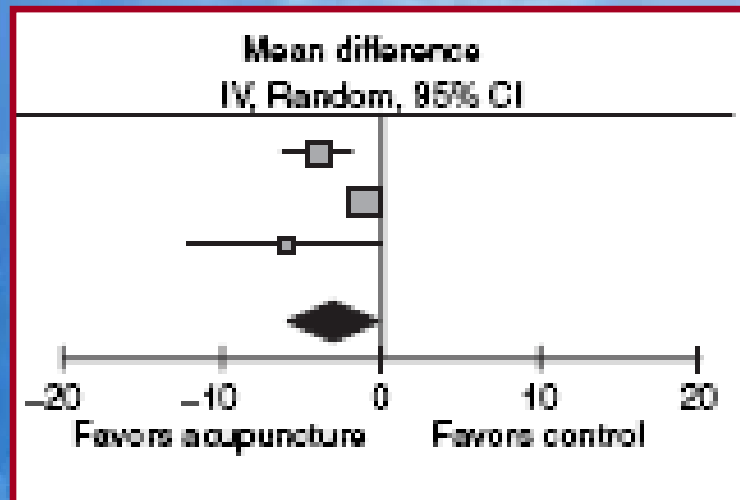


# « High-Quality Trials » Meta-analyse

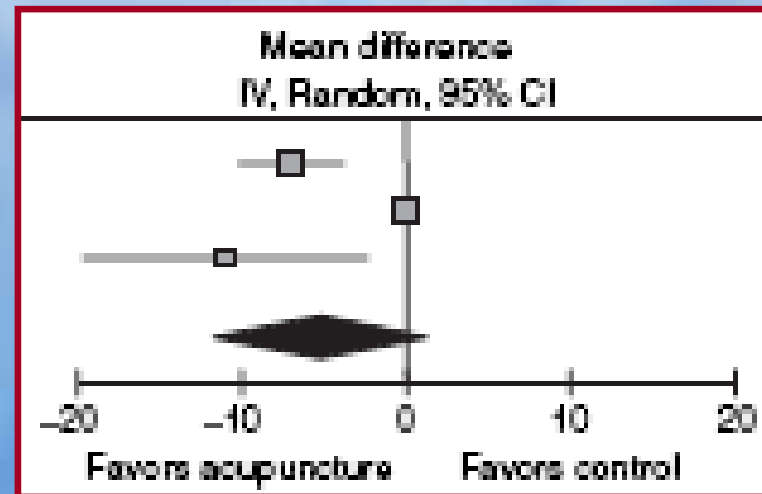
Acupuncture plus anti-hypertenseur  
vs. SHAM plus anti-hypertenseur  
et

## Acupuncture vs. SHAM

Flachskampf et al., Circulation, 2007 - Yin et al., Neurol Res 2007  
Macklin et al., Hypertension, 2006



$\Delta$  mmHg systolique -5 [-12,1]



$\Delta$  mmHg diasystolique -3 [-6,0]



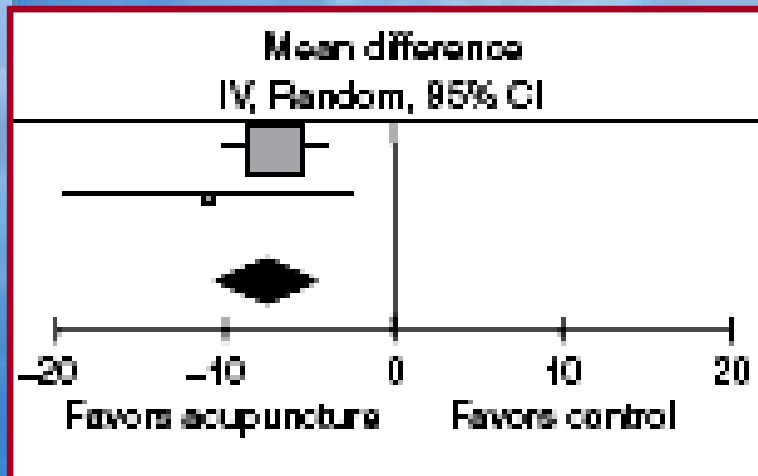
# « High-Quality Trials » Meta-analyse

Acuponcture plus anti-hypertenseur

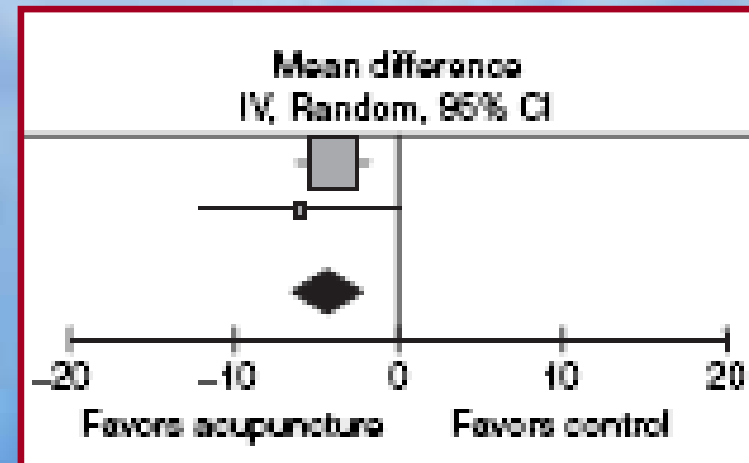
vs.

SHAM plus anti-hypertenseur

Flachskampf et al., Circulation, 2007 - Yin et al., Neurol Res 2007



$\Delta$  mmHg systolique -8 [-10,-5]



$\Delta$  mmHg diasystolique -4 [-6,-2]



# Analyse de données

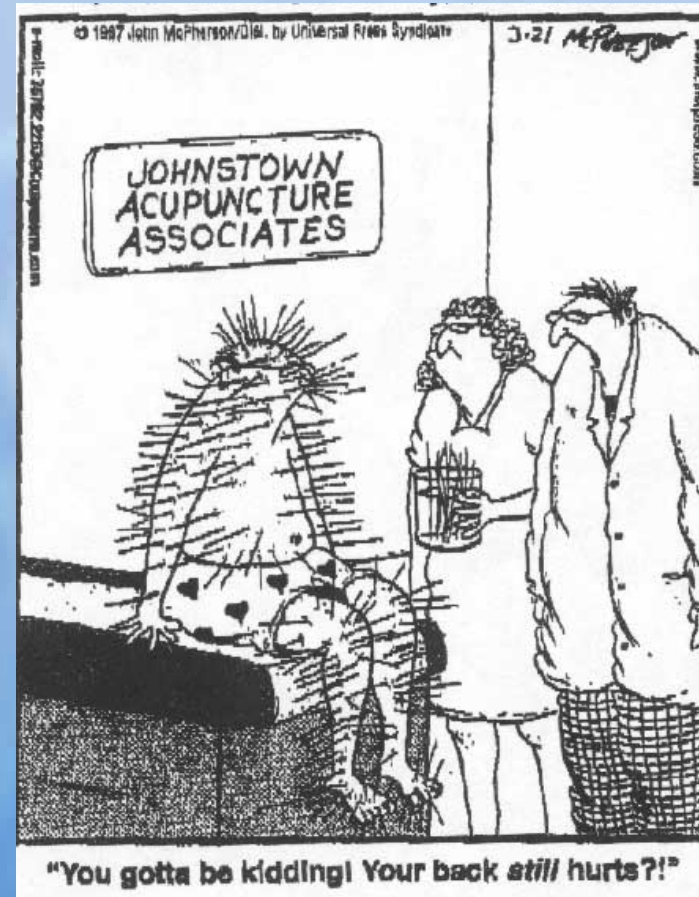
Pas d'association significative de résultats concernant:

- Qualité de l'étude (high vs. low Modified Oxford Scale)
- Type de contrôles (Ø traitement vs. ttt HTA, SHAM)
- Méthode d'acuponcture (indiv. vs. standard)
- Pays de réalisation (  vs. non-  )



# Effets secondaires

- Crise hypertensive
- Douleur
- Saignement





# Discussion



# Discussion Trend

- Sample population
- Quality of the reviews and RCT
- BP change effect by different RCT/ SR
- Recommendation and What we need to Know..
- Conclusion



# Discussion 1

- Sham-controlled trials

(N= 3)

Real acupuncture only  
marginally reduced

DBP (approximately -3  
mm Hg, 95% CI (-6, 0),  $P$   
= 0.05,  $I^2$  = 79%)

but not

SBP

(approximately -5 mm Hg,  
95% CI (-12, 1),  $P$  = 0.12,  $I^2$   
= 92%).

«2 trials in which  
concomitant  
antihypertensive  
medication was given to  
both acupuncture and  
sham groups resulted in  
significant BP reductions

(-8/-4 mm Hg),

without significant  
heterogeneity between  
studies ( $I^2$  = 0%).



# Method Quality

The methodological quality:

The modified Oxford scale, ( 1 to 5)

Poorly reported ( < 3)

7/11 excluded (failed to report awaited outcome)

Hence no bias to have affected the reported findings.

Moher D, et al Lancet 1998; 352:609–613  
Schulz KF et al .JAMA 1995; 273:408–412



# Method Quality

- Bias could be introduced by including low quality trials through extensive literature searches.

Egger et al Health Technol Assess 2003; 7:1

- Therefore, it would rather have strengthened the sound conclusion of the review.



# BP Effect

- Interestingly, acupuncture alone reduced BP similarly as antihypertensive medication leading to no significant results but when given *with* medication, acupuncture seems to have little additional effect.

Jiang X et al J trad Chin Med 2003;23:290-291

Wang l et Al J Hubei coll TCM 2006;8-

But

- Contradictory with the results from sham-controlled high-quality trials in which acupuncture significantly reduced BP only if given *with* medication
  - High mean baseline ? (134/83 mm Hg vs. 164/88 mm Hg)
  - Treatment period? (6–8 weeks vs. 1–3 weeks)

Flachskampf et al Circulation 2007



# Recommendation

- Homogenous sample population.
- Larger Sample sizes (average 35 in our reviews) to render the validity unquestionable.
- What population, what type of Acupuncture?
- Should it be used as an adjunct?
- Secondary outcome of Acupuncture for End Organ damages? ( Heart attack, Stroke, etc..)



# Conclusion

- **Does Accupuncture Lower BP?**
- **The findings of our SR are inconsistent**
- **Most of the searched studies had low methodologic quality.**



Bonne soirée..

