Hypertensive emergency is common but a severe clinical outcome in hypertensive patients.

The definition of the hypertensive emergency goal blood pressure is not consistent over the literature, but often involves a target organ damage in a situation of emergency.

Treatment practice in hypertensives crisis is difficult because of the lack of evidence supporting the use of one drug over another and a consensus on the posology.

After review of the medical literature, we found only four randomized trials comparing Nitroprussiate to Uradipil or Nifedipine, or nifedipine to captopril. Those trials included only few patients, and Ib or Iib probe level without long term morbidity data.

In conclusion, the clinical practice is still far away from the Evidence-based Medicine. Clinical research must go further to prevent cerebral, cardiovascular or renal complications in hypertensive patients.

TRANSFORMING GROWTH FACTOR-BETA ACTIVITY IN MACROPHAGES PROTECTS FROM ANGIOTENSIN II-INDUCED AORTIC ANEURYSM IN MICE

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Background — Complicated aortic aneurysm is a major cause of mortality in elderly men. The critical pathophysiological mechanisms responsible for disease development and complications remain largely unknown. Mutations in transforming growth factor (TGF)-β receptor type II are associated with familial forms of the disease, and increased angiotensin II (AII)-dependent TGF-β activity has been directly linked to aortic aneurysm formation in a mouse model of Marfan syndrome. However, the direct role of TGF-β signaling in common forms of the disease has not been assessed.

Methods and Results — All-induced abdominal aortic aneurysm (AAA) is a validated model of aneurysm formation in mice, and is prevented, like murine Marfan syndrome, by treatment with angiotensin II receptor type 1 antagonists. Normocholesterolemic C57Bl/6 mice are resistant to All-induced AAA. Here, we show that systemic neutralization of TGF-β activity leads to unexpected and marked increase in the susceptibility of these mice to All-induced AAA (from -10% to 92.5%, n=40). These AAA display a large spectrum of complications on echography, including thrombosis, fissuration, false channel formation and rupture, leading to a high level of mortality (65%). Unexpectedly, the disease and its complications were refractory to inhibition of IFN-γ (n=10, 100% AAA), deletion of IL-4 (n=10, 80% AAA) or deletion of T and B lymphocytes (n=22 Rag-/- mice, 77.5% AAA). Interestingly, depletion of circulating monocytes for 14 days using clodronate liposomes completely prevented AAA formation (0% AAA in clodronate group vs 60% AAA at day 14 in the group without clodronate).

Conclusions — This study identifies a major protective effect of TGF-β activity against AngII-induced AAA, through modulation of monocyte/macroage function.

EFFECTS OF HIGH SALT DIET ON MECHANICAL PROPERTIES OF THE MIDDLE CEREBRAL ARTERY

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A high salt diet (HSD) is a risk factor for stroke. However, little is known about the consequences of a HSD on the mechanical properties of cerebral vessels. The aim of the present work was to evaluate the impact of a HSD on the distensibility of the middle cerebral artery (MCA).

Methods — Normotensive male Wistar rats were given a normal diet (n=11) or HSD (n=10; 1% NaCl in drinking water) for 1 month. Sodium balance was calculated as the difference between sodium intake and sodium excretion. MCA were mounted and pressurized (60 mmHg, i.e. 60% of mean blood pressure, BP) in a small vessel arteriograph. Passive (inactivation of smooth muscle cells, EDTA 2mM) internal diameter (ID) and wall thickness (WT) of MCA were measured during a stepwise increase in intraluminal pressure (IP, 20 to 160 mmHg, 20 mmHg per step). Stress (σ = ID x IP / 2WT) and strain (ε = (ID-ID0) / ID0 where ID0 is ID at 20 mmHg) were calculated. Stress—strain data were fitted to an exponential curve σ = σ0.e(ET .ε)., where σ0 is the stress at 20 mmHg and ET is the slope of the tangential elastic modulus versus stress.

Results — HSD produced a positive sodium balance (5±1 mEq/24h/kg, P<0.05 versus -1±1 in controls) but did not modify BP (110±6 mmHg, 109±4 in controls rats). The stress-strain curve was shifted to the left in rats with a HSD (ET: 8.1±0.8, P<0.05 versus 5.8±0.4 in controls) but did not modify BP (110±6 mmHg, 109±4 in controls rats). The stress-strain curve was shifted to the left in rats with a HSD (ET: 8.1±0.8, P<0.05 versus 5.8±0.4 in controls).

In conclusion, a HSD induces an increase in wall stiffness of the MCA in the absence of any effect on BP. This may (partially) contribute to the cerebrovascular dysfunction linked to stroke in patients on a HSD.