Hypertensive Encephalopathy

- acute syndrome that accompanies markedly elevated blood pressures (malignant hypertension).

Pathophysiology

1. **Vasospasm theory** (largely discounted) - based on observed *retinal vasospasm* (suggested that similar intracerebral vasospasm may cause focal ischemia).
2. **Loss of autoregulation theory** – in severe hypertension upper limit of cerebral arterial autoregulation is exceeded → cerebral blood flow rises passively with further increases in systemic BP; i.e. progressively higher pressures are transmitted into capillary system → movement of plasma and even some cellular elements into brain tissue → multifocal or diffuse edema (± hemorrhages that vary in size from petechial to massive).

Clinical Features

* + - 1. **Prominent diffuse cerebral dysfunction** - increased ICP (headache, nausea, vomiting, visual blurring, confusion, progressive consciousness↓, occasional generalized seizures)

Symptoms are reversed when BP is reduced! (but permanent damage may have occurred)

* + - 1. Infrequently **focal neurologic dysfunction** ← in general, suggest some other vascular disease.
      2. **Retinal changes** (hypertensive retinopathy grade IV - characteristic of severe hypertension) – hemorrhages, exudates, papilledema.

N.B. arteriolar narrowing may be only abnormality.

* + - 1. Evidence of *renal and cardiac disease* may be present.
      2. **CSF** - pressure↑ and proteins↑.

Differential diagnosis

* **stroke** (hemorrhagic, ischemic) - ***focal signs predominate*** over diffuse signs.
* **increased ICP from other causes** (obstructive hydrocephalus, brain tumor, subdural hematoma) - can elevate BP via Cushing reflex (neurogenic hypertension), but ***retinal changes suggesting chronic hypertension are absent***.

Treatment

- medical emergency!

1. Acute, deliberate **BP lowering** (e.g. nitroprusside IV)

N.B. *avoid hypotensive or even normal levels* - in chronic hypertension, upper and lower limits of autoregulation are shifted upward - if BP is lowered below lower limit of patient's intrinsic autoregulation (which can rise as high as 120 mmHg), cerebral ischemia can result! (watershed infarcts)

1. *Avoid hypercapnia* (dilates cerebral blood vessels → cerebral blood flow↑); H: controlled ventilation.
2. *Avoid seizures* (further increase cerebral blood flow); H: anticonvulsants (e.g. diazepam 10-20 mg slowly IV → follow by phenytoin or carbamazepine).
3. Hypertensive encephalopathy ***associated with pregnancy (eclampsia)***, usually responds well to **prompt fetus delivery**.

*Panaudota literatūra*: see Vas1 p.