In Patients With Carotid Disease Or A Stroke, What Level Of BP Maintenance Is Too Low?: A Note Of Caution. What About LDL-C: Where Should It Be And Can It Be Too Low?

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Management of blood pressure in carotid stenosis
Considerations:
• Unilateral vs. bilateral stenosis
• CBF reserve
• Diastolic J Curve with diastolic < 60 and pulse pressure > 80
• Blood pressure gradients in the brain
• Cuff artefact

High blood pressure increases stroke risk in patients with carotid stenosis

But not with severe bilateral carotid stenosis
The brains of patients with severe bilateral stenosis are protected from hypertension; this protection is lost after endarterectomy
Spence JD. Ch 8 in: Carotid artery stenosis: Current and emerging treatments. New York: Taylor and Francis, 2005

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CBF reserve
• Patients with reduced CBF reserve are probably at risk if BP is too low
• Evidence is lacking, but common sense says so
• Hemodynamic TIA's are rare, but they happen
• “Limb-shaking TIAs”
Diastolic J Curve with wide pulse pressure
In patients with diastolic pressure < 60 and pulse pressure > 60
  • A doubling of coronary risk
  • A 5.85-fold increase in stroke risk
Because:
  • All of coronary blood flow and most of cerebral blood flow are diastolic
  • There is a big drop in blood pressure from the base of the brain to small arterioles over the convexity
  • Patients with stiff arteries are more likely to have a cuff artefact


A note of caution
Most coronary flow is during diastole
In patients with wide pulse pressure, DPB > 60 T coronary risk in ARIC

Blood pressure gradient in the brain
Brachial artery 117/75
Lenticulostriate 113/73
Parietal subcortical 59/39

“Pseudohypertension”
(Cuff artefact in measurement of blood pressure)
Intra-arterial pressure vs. cuff pressure
Among patients with diastolic > 100 mmHg and no end-organ disease
Above age 60,
  • 69% had 15 mmHg diastolic cuff error
  • 50% had 30 mmHg diastolic cuff error

Patients with stiff arteries are more likely to have a large cuff artefact (pseudohypertension), so their intra-arterial diastolic pressure is much lower than the cuff pressure

55 healthy volunteers age 59-80  Mean 68.86 ± 5.2
Pulse wave velocity correlated with cuff artefact

Finnegan T, Spence JD et al. J Hypertension 1985, 3:231-235
If a patient complains of postural hypotension with blood pressures that seem too high to explain it, measure the intra-arterial pressure.

How low should LDL-C be?

- As low as possible
- Some patients require extraordinarily low LDL-C to stop progression of plaque
- There is no reason for concern about LDL-C down to 0.2 mmol/L (7.6 mg/dL)

Plaque progression despite usual therapy doubles the risk.*

*Adjusted for Age, sex, SBP, tChol, pack-ys, thcy, diabetes, Rx lipids and BP

Usual care was failing in half the cases, and they were at twice the risk: we needed to do better! This led to “Treating arteries instead of treating risk factors.”

Treating arteries without measuring plaque is like treating hypertension without measuring the blood pressure.

Resistant Atherosclerosis

Neither achieved LDL-C nor change in LDL-C was correlated with progression/regression.

Resistant Atherosclerosis

Even with LDL-C <1 mmol/L (38 mg/dL), half had plaque progression, and only 35% had regression (Because the ones who were more resistant were the ones being treated more intensively)

I have hundreds of patients with LDL-C <1mg/dL, and a couple of dozen with LDL-C < 0.2 mmol/L (7.6 mg/dL)

Whoa! aren’t you worried about very low LDL? Nope: it’s a myth

Stroke, Death or MI by LDL-C
No safety concerns down to LDL-C of 0.2 mmol/L (7.6 mg/dL)