At a glance

Retinal vessel analysis for hypertension

Around 1.3 billion people worldwide suffer from hypertension. However, since this disease is mostly asymptomatic at the beginning and therefore has few warning signs, a good half of these patients are not even aware of their disease and the associated risk.[1] The visit to the specialist or general practitioner often only takes place after the manifestation of symptoms. The bottom line is that **hypertension is considered a major risk factor for developing coronary heart disease (CHD) or stroke, which can be treated!**

The retinal microvessels are very sensitive to changes in blood pressure and often provide the first indications of developing or pre-existing disease.[1] The non-invasive method of retinal vessel analysis provides two valid parameters here, the AVR (arterio-venous ratio) and the CRAE (central retinal arterial equivalent), which in combination with traditional blood pressure measurement and 24h monitoring, allow a more detailed prognosis scheme as well as precise risk communication.

We recommend retinal vessel analysis as a cardiovascular screening tool to detect early signs of hypertension or to effectively determine and monitor vascular damage in pre-existing hypertension.

A study by Wong et al. shows that **normal pressure patients with a lower AVR had a 60% higher risk of developing high blood pressure within the following three years.**[2] These findings were demonstrated in both adults and children and were independent of other risk factors or ethnicity.[3,4] The study provides the following values:

Quintile	AVR range	OR* hypertension
5 (n = 1060)	0.57-0.79	1.62
4 (n = 1060)	0.80-0.84	1.29
3 (n = 1061)	0.85-0.88	1.29
2 (n = 1060)	0.89-0.92	1.21
1 (n = 1060)	0.93-1.22	1.0 (Reference)

Table: Correlation between AVR and relative chances of developing hypertension over a 3-year interval, *Odds ratio adjusted for sex, age, ethnicity, age of study population: 49 to 73 years

If the retinal vessel analysis shows an increased risk for the development of high blood pressure, the period for regular blood pressure check-ups should be significantly reduced and the patients should be monitored more closely.

[1] Heitmar et al. "How your eyes could help diagnose high blood pressure.", Online verfügbar: https://theconversation.com/how-your-eyes-could-help-diagnose-high-blood-pressure-186329 (2022)
[2] Wong, Tien Yin, et al. "Retinal arteriolar diameter and risk for hypertension." Annals of internal medicine 140.4 (2004): 248-255.
[3] Lona, Giulia, et al. "Retinal vessel diameters and blood pressure progression in children." Hypertension 76.2 (2020): 450-457. (2020)
[4] Köchli, Sabrina, et al. "Obesity, blood pressure and retinal microvascular phenotype in a bi-ethnic cohort of young children." Atherosclerosis 350 (2022): 51-57. (2022)

Imedos Health GmbH

Tatzendpromenade 2A • 07745 Jena • Germany
☎ +49 3641-63960
info@imedos.com • www.imedos.com