



At a glance

Retinal vessel analysis for coronary heart diseases

There are clear gender-specific differences in the development of coronary heart disease (CHD).¹ In order to obtain a more comprehensive and detailed prognosis scheme, for women in particular, an additional examination by means of retinal vessel analysis is required in addition to conventional examinations. According to current research, there is a clear discrepancy in women between the standardised risk scores used, such as the SCORE system, Framingham Heart and PROCAM, and the actual occurrence of CHD.²

Studies show that up to 21% of women initially identified as low-risk could be classified as intermediate-risk patients after retinal vessel analysis was performed.³

As a result, the respective treatment of these patients can be individually adapted, improved and their progress optimally monitored. This takes the form of:

- a reclassification of the patients,
- resulting treatment that complies with guidelines,
- therapy support and monitoring of success.



We recommend retinal vessel analysis for cardiovascular risk screening of all women classified as low-risk or intermediate-risk according to the standardised risk scores used.

Women with a low AV ratio have an up to 2.3-fold relative risk of developing CHD in the next 3.5 years.

In this respect, if the method of retinal vessel analysis is considered separately and apart from the standardised risk scores used, a negative correlation between the AV ratio and the occurrence of CHD in women is also noticeable. Basically, the lower the AVR value in women, the higher their individual CHD risk. An evaluation of the ARIC study provides the following values:

| Quintile | AVR range | CHD relative risk | |
|--------------------------|-----------|-------------------|-----|
| | | ♂ | ♀ |
| 1 (n♂ = 985 / n♀ = 944) | 0.57-0.78 | 1.1 | 2.2 |
| 2 (n♂ = 904 / n♀ = 1026) | 0.79-0.82 | 1.0 | 2.3 |
| 3 (n♂ = 827 / n♀ = 1103) | 0.83-0.86 | 1.2 | 1.6 |
| 4 (n♂ = 724 / n♀ = 1206) | 0.87-0.91 | 1.2 | 1.3 |
| 5 (n♂ = 640 / n♀ = 1289) | 0.91-1.22 | 1.0 (Reference) | |

Table: Correlation between AVR and the relative risk of developing CHD in a 3.5-year interval, n=9,648, age of study population: 51-72 years⁴

- [1] Shaw, Leslee J., et al. "Women's Ischemic Syndrome Evaluation: current status and future research directions: report of the National Heart, Lung and Blood Institute workshop: October 2-4, 2002: Section 5: gender-related risk factors for ischemic heart disease." *Circulation* 109.6 (2004): e56-e58.
- [2] McClintic, Benjamin R., et al. "The relationship between retinal microvascular abnormalities and coronary heart disease: a review." *The American journal of medicine* 123.4 (2010): 374-e1.
- [3] Seidelmann, Sara B., et al. "Retinal vessel calibers in predicting long-term cardiovascular outcomes: the atherosclerosis risk in communities study." *Circulation* 134.18 (2016): 1328-1338.
- [4] Wong, Tien Yin, et al. "Retinal arteriolar narrowing and risk of coronary heart disease in men and women: the Atherosclerosis Risk in Communities Study." *Jama* 287.9 (2002): 1153-1159.

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