**Supplementary Material**

**Supplementary appendix 1.** Search string.

The search string used in PubMed.

*((((((((((((("Retinal Vein Occlusion"[Mesh]) OR retinal vein occlusion\*[Text Word]) OR (((retinal vein occlusion\*[Text Word]) OR retinal vein obstruct\*[Text Word]) OR retinal vein thrombo\*[Text Word])) OR ((((retina vein occlusion\*[Text Word]) OR retina vein obstruct\*[Text Word]) OR retina vein thrombo\*[Text Word]))) OR (((((retina venous occlusion\*[Text Word]) OR retina venous obstruct\*[Text Word]) OR retina venous thrombo\*[Text Word])))) OR ((((((retinal venous occlusion\*[Text Word]) OR retinal venous obstruct\*[Text Word]) OR retinal venous thrombo\*[Text Word])))))))) AND ((Risk Factors[MeSH Terms]) OR (((((((risk\*) OR (risk factor\*)) OR (association\*)) OR (predisposing factor)) OR (etiolog\*)) OR (caus\*)) OR (causal factor\*)))*

The search string used in Embase.

*('retinal vein occlusion'/exp OR 'retinal vein occlusion' OR (('retinal'/exp OR retinal) AND ('vein'/exp OR vein) AND occlusion\*) OR (('retinal'/exp OR retinal) AND ('vein'/exp OR vein) AND obstruct\*) OR 'retinal vein'/exp OR 'retinal vein' OR (('retinal'/exp OR retinal) AND ('vein'/exp OR vein) AND thrombo\*) OR (('retina'/exp OR retina) AND ('vein'/exp OR vein) AND occlusion\*) OR (('retina'/exp OR retina) AND ('vein'/exp OR vein) AND obstruct\*) OR 'retina vein'/exp OR 'retina vein' OR (('retina'/exp OR retina) AND ('vein'/exp OR vein) AND thrombo\*) OR (('retina'/exp OR retina) AND venous AND occlusion\*) OR (('retina'/exp OR retina) AND venous AND obstruct\*) OR 'retina venous' OR (('retina'/exp OR retina) AND venous AND thrombo\*) OR (('retinal'/exp OR retinal) AND venous AND occlusion\*) OR (('retinal'/exp OR retinal) AND venous AND obstruct\*) OR 'retinal venous' OR (('retinal'/exp OR retinal) AND venous AND thrombo\*)) AND (risk:ti,ab,kw OR risks:ti,ab,kw OR 'predisposing factor\*':ti,ab,kw OR 'causal factor\*':ti,ab,kw OR association\*:ti,ab,kw OR etiolog\*:ti,ab,kw OR cause\*:ti,ab,kw)*

**Supplementary appendix 2.** Results of included studies, divided by effect measure used.

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| **Odds ratio** |
| **Study, year** | **Result** | **Comment** |
| Bertelsen et al., 2014 | Diabetes: 2.08 (1.41-3.08)Heart failure: 1.41 (0.84-2.34) Hypertension: 2.03 (1.48-2.78)Ischemic heart disease: 1.54 (1.12-2.12)Liver disease: 2.44 (0.97-6.17)Myocardial infarction: 1.57 (1.00-2.44) Peripheral artery disease: 3.21 (2.06-5.00)Peripheral venous disease: 2.10 (1.08-4.09) Stroke: 1.77 (1.23-2.53) |  |
| Bertelsen et al., 2012 | **10 years prior to RVO diagnosis:**Diabetes: 1.52 (1.16-1.99) Heart failure: 0.65 (0.44-1.01) Hypertension: 2.24 (1.81-2.27) Ischemic heart disease: 1.13 (0.93-1.38) Liver disease: 0.93 (0.44-1.97)Migraine drugs: 1.42 (0.93-2.16)Oral contraceptives: 1.56 (0.88-2.74)Myocardial infarction: 0.92 (0.67-1.25) Peripheral artery disease: 1.43 (1.07-1.91)Peripheral venous disease: 1.05 (0.66-1.68)Renal disease: 1.42 (0.86-2.35) Stroke: 1.08 (0.85-1.37) **1 year prior to RVO diagnosis:**Diabetes: 1.74 (1.40-2.17) Heart failure: 1.10 (0.61-2.00) Hypertension: 2.16 (1.86-2.51)Ischemic heart disease: 1.13 (0.63-1.41)Liver disease: 1.62 (0.51-5.09)Migraine drugs: 1.08 (0.59-1.96)Oral contraceptives: 3.28 (0.79-13.61)Myocardial infarction: 0.62 (0.26-1.5)Peripheral artery disease: 1.83 (1.14-2.95)Peripheral venous disease: 1.96 (0.87-4.45)Renal diases: 1.64 (0.77-3.49) Stroke: 1.38 (0.91-2.10)  |  |
| Bucciarelli et al., 2017 | Antiphospholipid antibodies: 1.24 (0.36-4.23)Antithrombin, Protein C, Protein S deficiency: 4.26 (0.68-26.68)Factor V Leiden: 1.54 (0.67-3.57)High Factor VIII: 2.14 (1.07-4.31)Hyperhomocysteine: 2.37 (1.29-4.36)Prothrombin G20210A: 0.82 (0.32-2.09) | All included as hypercoagulability. |
| Koizumi et al., 2007 | Anticoagulation use: 3.34 (1.44-7.80)Aspirin use: 2.66 (1.52-4.64)Glaucoma: 4.75 (2.33-9.71) |  |
| Sahin et al., 2019 | Neutrophil-to-lymphocyte ratio: 3.89 (1.83-8.25)Platelet-to-lymphocyte ratio: 1.02 (1.01-1.03) | Both included as inflammation markers. |
| Schwaber et al., 2018 | Diabetes: 2.41 (1.68-3.45)Glaucoma: 6.91 (4.08-11.70) Hypertension: 1.83 (1.22-2.75)Stroke: 2.14 (1.19-3.84) |  |
| Shih et al., 2014 | Stroke: 1.16 (1.11-1.21) Diabetes: 1.29 (1.23-1.35) Liver disease: 1.22 (1.16-1.29)Hyperlipidemia: 1.29 (1.23-1.35)Hypertension: 1.83 (1.74-1.93)Myocardial infarction: 1.11 (1.00-1.22) Peripheral artery disease: 1.13 (1.03-1.24) Peripheral venous disease: 0.87 (0.62-1.20) Renal disease: 1.30 (1.23-1.37) Stroke: 1.16 (1.11-1.21)  |  |
| Shin et al., 2016 | Age: 1.72 (1.27-2.34)BMI: 1.01 (0.94-1.09)Cataract operation: 0.47 (0.16-1.36)Diabetes: 0.54 (0.20-1.50) *Fasting glucose: 1.01 (0.99-1.02)*Glaucoma: 1.60 (0.74-3.46)*HbA1c (per 1%): 0.98 (0.54-1.79)*Hyperlipidemia: 1.84 (1.01-3.35)Hypertension: 2.58 (1.31-5.08) Refractive errors: 0.98 (0.88-1.09)Renal disease: 0.77 (0.33-1.83)*Pulse pressure: 0.99 (0.97-1.02)*Stroke: 2.08 (1.01-4.45) Education:High school graduate: 1.35 (0.61-3.00)Some college: 1.07 (0.44-2.59)College graduate or more: 1.10 (0.34-3.66)Income:2nd quartile: 0.63 (0.31-1.25)3rd quartile: 0.33 (0.12-0.92)Upper quartile: 0.64 (0.29-1.43) | HbA1c and fasting glucose excluded, because of diabetes.Pulse pressure excluded because of hypertension.Income collapsed to one group above 1st quartile.Education collapsed to one group with all education levels above 12th grade.  |
| Sofi et al., 2007 | Age: 0.99 (0.98-1.02)Diabetes: 2.09 (0.93-4.73)Hypertension: 3.15 (1.94-5.12) Sex: 1.08 (0.68-1.69)Smoking: 2.34 (1.35-4.07)Erythrocyte deformability index:1st tertile: 4.99 (2.76-9.05)2nd tertile: 1.29 (0.61-2.36)3rd tertile: refWBV (94.5 sec-1 shear rate, mPa.s):1st tertile: ref2nd tertile: 1.60 (0.82-3.16)3rd tertile: 4.29 (2.52-7.31)WBV (0.512 sec-1 shear rate, mPa.s):1st tertile: ref2nd tertile: 0.55 (0.29-1.04)3rd tertile: 2.78 (1.15-6.72) | WBV excluded, because of hypertension.1st and 2nd tertile of erythrocyte deformability index collapsed to one group. |
| Sofi et al., 2009 | Hyperlipidemia: 2.15 (1.39-3.32) |  |
| Sottilotta et al., 2010 | Sex: 1.59 (0.78-3.27)Age: 45-54: 7.03 (3.09-15.99)55-64: 33.70 (13.46-84.36)>65: 46.02 (17.61-120.22)C677T MTHFR genotype: heterozygosity: 0.86 (0.40-1.84)homozygosity: 1.01 (0.45-2.25)Homocysteine: 16-20: 1.04 (0.33-3.26)21-30: 4.80 (1.58-14.63)>31: 6.06 (1.43-25.75)  | Age included as single observations and not as individual groups.Homocysteine and C677T MTHFR genotype included as hypercoagulability.Homocysteine 16-20 excluded. |
| Thapa et al., 2010 | Diabetes: 0.88 (0.37-2.07)Hypertension: 7.06 (4.69-10.62) Open angle glaucoma: 5.77 (1.61-20.69)Refractive errors: 2.40 (1.64-3.51)Primary angle glaucoma: 1.85 (0.41-8.35) | Both Glaucoma types included as glaucoma. |
| The Eye Disease Study, 1996 | Diabetes: 2.0 (1.3-2.9) Glaucoma: 5.3 (3.5-8.0)Hypertension: 2.5 (1.8-3.4) Alcohol: former: 0.9 (0.6-1.3), current: 0.5 (0.4-0.7)Antithrombin III: 91-116: 1.2 (0.8-1.9)≥117: 1.7 (1.1-2.7)*Daily ethanol consumption:* *<1 oz: 0.6 (0.4-0.8)**≥1 oz: 0.5 (0.3-0.8)*Education:≥12 grades: 0.6 (0.4-0.8)Electrocardiogram abnormalities: mild: 1.1 (0.8-1.6)severe: 1.6 (1.1-2.5)Fibrinogen: 2.26-3.34: 1.2 (0.8-1.7)≥3.35: 1.5 (0.9-2.3) *Glucose:**4.91-6.29: 1.0 (0.7-1.4)**≥6.3: 1.5 (0.97-2.3)*HDL cholesterol: 1.05-1.80: 0.9 (0.6-1.3)≥1.81: 0.6 (0.4-1.01)Intraocular pressure: 14-19: 2.4 (1.4-3.9)≥20: 4.5 (2.6-7.7)Oral contraceptive use:former: 0.5 (0.3-0.9)current: 0.2 (0.1-0.7)Physical activity: *subjective in past:* *Average: 0.7 (0.4-1.3)* *>average: 0.5 (0.3-0.8)* *subjective in present:* *average: 0.6 (0.4-0.9)* *>average: 0.4 (0.3-0.7)* Vigorous physical activity: 1-2: 0.7 (0.5-1.04)≥3: 0.7 (0.5-0.98)*systolic BP:* *120-151: 1.9 (2.0-6.9)* *≥152: 3.8 (2.3-6.5)**diastolic BP:* *70-90: 1.4 (0.9-2.2)**≥91: 2.5 (1.4-4.4)* | Daily ethanol consumption excluded, because of alcohol.Vigorous physical activity included as measure of physical activity. 1-2 and ≥3 collapsed to one group of physical activity.Electrocardiogram abnormalities collapsed to one group.Systolic and diastolic excluded, because of hypertension.Antithrombin III and Fibrinogen included as hypercoagulability.Glucose excluded, because of diabetes. |
| The Eye Disease Study, 1993 | Diabetes: 1.6 (1.1-2.4) Electrocardiogram abnormalities: 1.4(1.1-1.9)Glaucoma: 2.3 (1.5-3.8)Hypertension: 3.6 (2.6-5.0) Albumin/globulin ratio: 1.39-1.87: 0.7 (0.5-1.03) ≥1.88: 0.7 (0.4-1.1) Alcohol: former: 0.9 (0.6-1.3) current: 0.6 (0.4-0.9)alpha2-globulin: 5.71-8.19: 1.3 (0.9-2.0)≥8.20: 2.1 (1.3-3.3)BMI: at interview: *22.7-30.4: 1.2 (0.8-1.7)* ≥30.5: 1.7 (1.1-2.7) *at 20 years:* *19.4-24.3: 1.5 (1.01-2.3)* *≥24.4: 1.9 (1.2-3.0)**Daily ethanol consumption:* *<1 oz: 0.7 (0.5-0.95)* *≥1 oz: 0.5 (0.3-0.9)*Erythrocyte sedimentation rate: 6-31: 0.9 (0.6-1.4) ≥32: 1.4 (0.8-2.3)*Glucose:* *4.91-6.29: 1.7 (1.1-2.7)* *≥6.3: 2.0 (1.2-3.3)*HDL cholesterol: 1.05-1.80: 0.7 (0.5-0.9)  ≥1.81: 0.4 (0.2-0.6)Hyperlipidemia: 0.79-1.92: 1.2 (0.8-1.8) ≥1.93: 1.7 (1.1-2.6)Intraocular pressure: 14-19: 1.0 (0.7-1.4)≥20: 1.3 (0.8-2.0)Physical activity: *subjective in past:* *Average: 0.6 (0.5-0.9)* *>average: 0.5 (0.3-0.9)* *subjective in present:* *average: 0.5 (0.4-0.8)* *>average: 0.3 (0.2-0.5)* Vigorous physical activity: 1-2: 0.7 (0.5-1.1) ≥3: 0.6 (0.4-0.8)*Systolic BP:* *120-151: 3.7 (2.0-6.9)* *≥152: 7.2 (3.8-13.7)**Diastolic BP:* *70-90: 1.5 (0.9-2.4)**≥91: 3.6 (2.0-6.4)* | Daily ethanol consumption excluded, because of alcohol.Vigorous physical activity included as measure of physical activity. 1-2 and ≥3 collapsed to one group of physical activity.BMI at interview included as measure of BMI. ≥30.5 included as measure of elevated BMI.Systolic and diastolic excluded, because of hypertension.Albumin/globulin ratio and alpha2-globulin included as hypercoagulability.Glucose excluded, because of diabetes. |
| Weger et al., 2005 | FII 20210A: 1.50 (0.43-5.27)FV 506Q: 0.92 (0.51-1.67) FXII 46T: 1.21 (0.92-1.58)Fibrinogen beta-455A: 1.05 (0.79-1.39)GPIa 807T: 0.98 (0.76-1.27)GPIIIa PIA2: 1.06 (0.74-1.51)Hyperlipidemia: 2.54 (1.74-3.70) Hypertension: 2.32 (1.62-3.32) Smoking: 1.48 (1.00-2.21) | FII 20210A, FV 506Q, Fibrinogen beta-455A, FXII 46T, GPIa 807T, and GPIIIa PIA2 included as hypercoagulability. |
| Zhang et al., 2019 | NMHC: T1: Ref T2: 1.09 (0.94-1.26) T3: 2.59 (2.25-2.97)THC: T1: ref T2: 2.33 (1.87-2.91) T3: 13.52 (11.06-16.53) | THC and NMHC included as hydrocarbons. T2 and T3 collapsed to one group for both THC and NMHC. |
| **Hazard rate ratio** |
| **Study, year** | **Result** | **Comment** |
| Chang et al., 2016 | Renal disease: 3.05 (2.64-3.51) |  |
| Chang et al., 2021 | Diabetes: 1.76 (1.61-1.93) |  |
| Ha et al., 2021 | Depression: 1.159 (1.096-1.226) |  |
| Hashimoto et al., 2022 | BMI: 1.31 (1.21-1.41)Hypertension: 2.25 (2.06-2.46) |  |
| Kim et al., 2019 | HDL-concentration:Q1: 1.17 (1.15-1.19)Q2: 1.12 (1.19-1.14) Q3: 1.07 (1.05-1.09) | HDL-concentration levels collapsed to one group. |
| Lee et al., 2021 | Renal disease: 5.71 (4.35-7.50)*Kidney transplantation: 2.72 (2.03-3.64)* | Kidney transplantation excluded, because of renal disease. |
| Moon et al., 2021 | Renal disease: 3.91 (3.58-4.28) |  |
| Newman-Casey et al., 2014 | Anticoagulation use: 1.11 (0.98-1.25)Cancer: 0.88 (0.77-1.00)Diabetes: 1.49 (0.74-2.97)DVT/PE: 0.98 (0.71-1.35)Exfoliation Syndrome: 0.94 (0.67-1.32)Glaucoma: 1.08 (0.97-1.21)Heart failure: 1.07 (0.94-1.21) Hypercoagulable state: 1.43 (0.84-2.44)Hyperlipidemia: 0.95 (0.71-1.27)Hypertension: 1.78 (1.36-2.32)Intraocular pressure: 0.69 (0.52-0.91)Migraine: 0.96 (0.79-1.17)Myocardial infarction: 1.00 (0.85-1.18) Peripheral vascular disease: 1.02 (0.91-1.13)Sex (female): 1.00 (0.91-1.09)Stroke: 1.34 (1.18-1.51)Education: high school diploma: 1.00 (0.66-1.51)Some college: 0.96 (0.63-1.46) college degree: 0.97 (0.63-1.49) Advanced degree: 0.42 (0.10-1.79)Networth:25-75,000: 1.04 (0.82-1.33) 75-150,000: 0.89 (0.72-1.11) 150-500000: 0.86 (0.72-1.04) >500000: 0.82 (0.66-1.01)Race: Afro-Caribbean: 1.43 (1.19-1.73) Latino: 1.08 (0.85-1.37) Asian-American: 1.39 (1.02-1.89) | Education collapsed to one group with all education levels above 12th grade.Networth collapsed to one group above 25,000. |
| Paik et al., 2020 | BMI:*<18.5: 0.83 (0.79-0.86)**18.5-23: Reference**23-25: 1.16 (1.14-1.17)**25-30: 1.31 (1.29-1.33)*30≤: 1.44 (1.39-1.49) | 30≤ included as measure of elevated BMI |
| Stem et al., 2013 | Age-related macular disease: 1.50 (1.31-1.72)Anticoagulantion use: 1.04 (0.89-1.22)Cataract: 1.24 (1.08-1.42)Diabetes: 0.93 (0.29-3.02) DVT/PE: 0.86 (0.55-1.34)Exfoliation syndrome: 1.09 (0.71-1.69)Glaucoma: 1.50 (1.30-1.72)Hypercoagulable state: 2.45 (1.40-4.28)Hyperlipidemia: 1.03 (0.68-1.54)Hypertension: 1.66 (1.14-2.42) Intraocular pressure: 0.87 (0.62-1.23)Myocardial infarction: 0.72 (0.57-0.92)Peripheral artery disease: 1.15 (1.00-1.33) Pseudophakia/Aphakia: 0.98 (0.85-1.12)Sex (Female): 0.75 (0.66-0.85)Stroke: 1.44 (1.23-1.68) Net worth: 25-75,000: 0.99 (0.72-1.35) 75-150,000: 0.83 (0.63-1.10) 150-500,000: 0.82 (0.65-1.04) >500,000: 0.73 (0.56-0.96)Race: Afro-Caribbean: 1.58 (1.25-1.99) Latino 1.15 (0.84-1.57) Asian-American: 0.75 (0.43-1.30) | Networth collapsed to one group above 25,000. |
| **Rate ratio** |
| **Study, year** | **Result** | **Comment** |
| Goldacre et al., 2012 | Diabetes: 5.76 (5.28-6.27) Hypertension: 2.99 (2.52-3.51)  |  |

**Supplementary appendix 3.** Calculating weighted mean effect measure.

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| Information obtained from the included studies | Effect measure | E |
| 95% CI | CIlow, CIup |
| Population size | N |
| Variance was calculated for each observation | Var | $$Var=\frac{\sqrt{N}\*(CI\_{up}-CI\_{low})}{1.96}$$ |
| Weighting the variance | Wvar | $$W\_{var}=1/Var$$ |
| Weighting effect measure | WE | $$WE=W\_{var}\*E$$ |
| Weighting CI | WCIup | $$WCI\_{up}=W\_{var}\*CI\_{up}$$ |
| WCIlow | $$WCI\_{low}=W\_{var}\*CI\_{low}$$ |
| Calculating the effect measure for all obs. Of a risk factor | EW | $$E^{W}=SUM(WE)/SUM(W\_{var})$$ |
| Calculating the CI for all obs. Of a risk factor | $$CI\_{up}^{W}$$ | $$CI\_{up}^{W}=SUM(WCI\_{up})/SUM(W\_{var})$$ |
| $$CI\_{low}^{W}$$ | $$CI\_{low}^{W}=SUM(WCI\_{low})/SUM(W\_{var})$$ |