Table 1. Baseline characteristics Athero-Express Biobank Study -- CEA only

| **Characteristic** | **female  N = 7921** | **male  N = 1,8031** | **p-value2** |
| --- | --- | --- | --- |
| **Hospital.** |  |  | 0.15 |
| St. Antonius, Nieuwegein | 305 (39%) | 642 (36%) |  |
| UMC Utrecht | 487 (61%) | 1,161 (64%) |  |
| **Year of surgery.** |  |  | >0.9 |
| No data available/missing | 0 (0%) | 0 (0%) |  |
| 2002 | 26 (3.3%) | 55 (3.1%) |  |
| 2003 | 43 (5.4%) | 114 (6.3%) |  |
| 2004 | 54 (6.8%) | 136 (7.5%) |  |
| 2005 | 53 (6.7%) | 133 (7.4%) |  |
| 2006 | 64 (8.1%) | 119 (6.6%) |  |
| 2007 | 42 (5.3%) | 110 (6.1%) |  |
| 2008 | 45 (5.7%) | 94 (5.2%) |  |
| 2009 | 59 (7.4%) | 124 (6.9%) |  |
| 2010 | 58 (7.3%) | 101 (5.6%) |  |
| 2011 | 47 (5.9%) | 118 (6.5%) |  |
| 2012 | 56 (7.1%) | 118 (6.5%) |  |
| 2013 | 45 (5.7%) | 104 (5.8%) |  |
| 2014 | 48 (6.1%) | 116 (6.4%) |  |
| 2015 | 22 (2.8%) | 55 (3.1%) |  |
| 2016 | 26 (3.3%) | 59 (3.3%) |  |
| 2017 | 15 (1.9%) | 51 (2.8%) |  |
| 2018 | 21 (2.7%) | 49 (2.7%) |  |
| 2019 | 21 (2.7%) | 45 (2.5%) |  |
| 2020 | 20 (2.5%) | 35 (1.9%) |  |
| 2021 | 19 (2.4%) | 47 (2.6%) |  |
| 2022 | 8 (1.0%) | 20 (1.1%) |  |
| **Age** | 69 (10) | 69 (9) | 0.6 |
| **TC\_final** | 5.00 (1.34) | 4.64 (1.46) | <0.001 |
| Unknown | 295 | 676 |  |
| **LDL\_final** | 2.91 (1.15) | 2.74 (1.25) | 0.003 |
| Unknown | 348 | 810 |  |
| **HDL\_final** | 1.35 (0.42) | 1.14 (0.42) | <0.001 |
| Unknown | 316 | 744 |  |
| **TG\_final** | 1.66 (0.93) | 1.75 (1.10) | 0.2 |
| Unknown | 325 | 762 |  |
| **systolic** | 152 (27) | 152 (24) | 0.7 |
| Unknown | 79 | 202 |  |
| **diastoli** | 80 (29) | 81 (22) | 0.033 |
| Unknown | 79 | 203 |  |
| **GFR\_MDRD** | 71 (22) | 75 (22) | <0.001 |
| Unknown | 36 | 72 |  |
| **BMI** | 26.5 (5.2) | 26.5 (3.5) | 0.024 |
| Unknown | 37 | 58 |  |
| **KDOQI classification, where eGFR (MDRD based) of 90 mL/min/1.73m2 is considered normal, as no proteinuria data is available.** |  |  | 0.001 |
| No data available/missing | 0 (0%) | 0 (0%) |  |
| Normal kidney function | 133 (18%) | 396 (23%) |  |
| CKD 2 (Mild) | 394 (52%) | 928 (54%) |  |
| CKD 3 (Moderate) | 216 (29%) | 377 (22%) |  |
| CKD 4 (Severe) | 10 (1.3%) | 22 (1.3%) |  |
| CKD 5 (Failure) | 3 (0.4%) | 7 (0.4%) |  |
| Unknown | 36 | 73 |  |
| **BMI, categories according to WHO.** |  |  | <0.001 |
| No data available/missing | 0 (0%) | 0 (0%) |  |
| Underweight | 19 (2.5%) | 8 (0.5%) |  |
| Normal | 304 (40%) | 628 (36%) |  |
| Overweight | 286 (38%) | 854 (49%) |  |
| Obese | 145 (19%) | 254 (15%) |  |
| Unknown | 38 | 59 |  |
| **SmokerStatus** |  |  | <0.001 |
| Current smoker | 305 (41%) | 568 (33%) |  |
| Ex-smoker | 289 (39%) | 967 (56%) |  |
| Never smoked | 154 (21%) | 196 (11%) |  |
| Unknown | 44 | 72 |  |
| **AlcoholUse** | 363 (48%) | 1,230 (70%) | <0.001 |
| Unknown | 42 | 56 |  |
| **DiabetesStatus** |  |  | 0.2 |
| Control (no Diabetes Dx/Med) | 619 (78%) | 1,367 (76%) |  |
| Diabetes | 171 (22%) | 436 (24%) |  |
| Unknown | 2 | 0 |  |
| **Do you have hypertension?** |  |  | <0.001 |
| No data available/missing | 0 (0%) | 0 (0%) |  |
| no | 154 (20%) | 481 (27%) |  |
| yes | 623 (80%) | 1,280 (73%) |  |
| Unknown | 15 | 42 |  |
| **Treated for hypertension? Self-reported treatment for hypertension** |  |  | 0.002 |
| No data available/missing | 0 (0%) | 0 (0%) |  |
| no | 202 (26%) | 577 (33%) |  |
| yes | 564 (74%) | 1,168 (67%) |  |
| Unknown | 26 | 58 |  |
| **Hypertension and/OR using hypertension drugs (to assess hypertension only, use Hypertension1)** |  |  | 0.3 |
| No data available/missing | 0 (0%) | 0 (0%) |  |
| no | 108 (14%) | 277 (15%) |  |
| yes | 681 (86%) | 1,526 (85%) |  |
| Unknown | 3 | 0 |  |
| **Use of one or more antihypertensive drugs** |  |  | >0.9 |
| No data available/missing | 0 (0%) | 0 (0%) |  |
| no | 186 (24%) | 425 (24%) |  |
| yes | 598 (76%) | 1,374 (76%) |  |
| Unknown | 8 | 4 |  |
| **Anti-coagulant use?** |  |  | 0.001 |
| No data available/missing | 0 (0%) | 0 (0%) |  |
| no | 715 (92%) | 1,565 (87%) |  |
| yes | 64 (8.2%) | 224 (13%) |  |
| Unknown | 13 | 14 |  |
| **Anti platelet drug use?** |  |  | 0.013 |
| No data available/missing | 0 (0%) | 0 (0%) |  |
| no | 79 (10%) | 243 (14%) |  |
| yes | 706 (90%) | 1,553 (86%) |  |
| Unknown | 7 | 7 |  |
| **Used any statin and/or LLD?** |  |  | 0.7 |
| No data available/missing | 0 (0%) | 0 (0%) |  |
| no | 151 (19%) | 360 (20%) |  |
| yes | 633 (81%) | 1,438 (80%) |  |
| Unknown | 8 | 5 |  |
| **Ever had a stroke (CVA) diagnosed?** |  |  | 0.14 |
| Missing | 0 (0%) | 0 (0%) |  |
| No stroke diagnosed | 586 (78%) | 1,308 (76%) |  |
| Stroke diagnosed | 162 (22%) | 422 (24%) |  |
| Unknown | 44 | 73 |  |
| **Cerebrovascular symptoms based on questionnaire AE (indication for CEA).** |  |  | 0.065 |
| missing | 0 (0%) | 0 (0%) |  |
| Asymptomatic | 67 (8.5%) | 219 (12%) |  |
| TIA | 324 (41%) | 687 (38%) |  |
| minor stroke | 129 (16%) | 281 (16%) |  |
| Major stroke | 78 (9.9%) | 198 (11%) |  |
| Amaurosis fugax | 136 (17%) | 276 (15%) |  |
| Four vessel disease | 15 (1.9%) | 23 (1.3%) |  |
| Vertebrobasilary TIA | 1 (0.1%) | 4 (0.2%) |  |
| Retinal infarction | 8 (1.0%) | 29 (1.6%) |  |
| Symptomatic, but aspecific symtoms | 11 (1.4%) | 45 (2.5%) |  |
| Contralateral symptomatic occlusion | 2 (0.3%) | 9 (0.5%) |  |
| retinal infarction | 2 (0.3%) | 7 (0.4%) |  |
| armclaudication due to occlusion subclavian artery, CEA needed for bypass | 1 (0.1%) | 0 (0%) |  |
| retinal infarction + TIAs | 0 (0%) | 1 (<0.1%) |  |
| Ocular ischemic syndrome | 11 (1.4%) | 16 (0.9%) |  |
| ischemisch glaucoom | 0 (0%) | 0 (0%) |  |
| subclavian steal syndrome | 1 (0.1%) | 1 (<0.1%) |  |
| TGA | 0 (0%) | 0 (0%) |  |
| Unknown | 6 | 7 |  |
| **Symptoms.5G** |  |  | 0.038 |
| Asymptomatic | 67 (8.5%) | 219 (12%) |  |
| Ocular | 147 (19%) | 292 (16%) |  |
| Other | 30 (3.8%) | 78 (4.3%) |  |
| Retinal infarction | 10 (1.3%) | 36 (2.0%) |  |
| Stroke | 207 (26%) | 479 (27%) |  |
| TIA | 325 (41%) | 692 (39%) |  |
| Unknown | 6 | 7 |  |
| **AsymptSympt** |  |  | 0.016 |
| Asymptomatic | 67 (8.5%) | 219 (12%) |  |
| Ocular and others | 187 (24%) | 406 (23%) |  |
| Symptomatic | 532 (68%) | 1,171 (65%) |  |
| Unknown | 6 | 7 |  |
| **AsymptSympt2G** |  |  | 0.007 |
| Asymptomatic | 67 (8.5%) | 219 (12%) |  |
| Symptomatic | 719 (91%) | 1,577 (88%) |  |
| Unknown | 6 | 7 |  |
| **Symptoms.Update2G** |  |  | 0.032 |
| Asymptomatic | 184 (28%) | 492 (33%) |  |
| Symptomatic | 471 (72%) | 994 (67%) |  |
| Unknown | 137 | 317 |  |
| **Symptoms.Update3G** |  |  | 0.066 |
| Asymptomatic | 184 (27%) | 492 (32%) |  |
| Symptomatic | 471 (70%) | 994 (65%) |  |
| Unclear | 22 (3.2%) | 54 (3.5%) |  |
| Unknown | 115 | 263 |  |
| **Was the operated artery restenotic or de novo lesion?** |  |  | <0.001 |
| missing | 0 (0%) | 0 (0%) |  |
| de novo | 720 (92%) | 1,708 (96%) |  |
| restenosis | 59 (7.6%) | 71 (4.0%) |  |
| stenose bij angioseal na PTCA | 0 (0%) | 0 (0%) |  |
| Unknown | 13 | 24 |  |
| **Preoperative degree of stenosis of the operated artery (measured with duplex). in case of more operated segments(femoral), worst stenosis.** |  |  | 0.10 |
| missing | 0 (0%) | 0 (0%) |  |
| 0-49% | 3 (0.4%) | 10 (0.6%) |  |
| 50-70% | 49 (6.3%) | 161 (9.1%) |  |
| 70-90% | 390 (50%) | 802 (45%) |  |
| 90-99% | 295 (38%) | 688 (39%) |  |
| 100% (Occlusion) | 9 (1.2%) | 26 (1.5%) |  |
| NA | 1 (0.1%) | 0 (0%) |  |
| 50-99% | 3 (0.4%) | 15 (0.8%) |  |
| 70-99% | 29 (3.7%) | 61 (3.5%) |  |
| 99 | 0 (0%) | 2 (0.1%) |  |
| Unknown | 13 | 38 |  |
| **Which artery was operated on, summarized?** |  |  | >0.9 |
| No artery known (yet), no surgery (patient ill, died, exited study), re-numbered to AAA | 0 (0%) | 0 (0%) |  |
| carotid (left & right) | 779 (98%) | 1,772 (98%) |  |
| femoral/iliac (left, right or both sides) | 0 (0%) | 0 (0%) |  |
| other carotid arteries (common, external) | 13 (1.6%) | 31 (1.7%) |  |
| carotid bypass and injury (left, right or both sides) | 0 (0%) | 0 (0%) |  |
| aneurysmata (carotid & femoral) | 0 (0%) | 0 (0%) |  |
| aorta | 0 (0%) | 0 (0%) |  |
| other arteries (renal, popliteal, vertebral) | 0 (0%) | 0 (0%) |  |
| femoral bypass, angioseal and injury (left, right or both sides) | 0 (0%) | 0 (0%) |  |
| **History of MI, CAD and/or coronary intervention(s) (PTCA and/or CABG)? (based on heart317/heart320/heart321)** |  |  | <0.001 |
| Missing | 0 (0%) | 0 (0%) |  |
| No history CAD | 604 (77%) | 1,164 (65%) |  |
| History CAD | 183 (23%) | 639 (35%) |  |
| Unknown | 5 | 0 |  |
| **Peripheral arterial occlusive disease (PAOD), femoral intervention, claudication, ABI<0.70.** |  |  | 0.6 |
| missing/no data | 0 (0%) | 0 (0%) |  |
| no | 628 (80%) | 1,417 (79%) |  |
| yes | 160 (20%) | 386 (21%) |  |
| Unknown | 4 | 0 |  |
| **History of peripheral intervention (including interventions in carotid and upper limb arteries?** | 184 (23%) | 360 (20%) | 0.053 |
| Unknown | 7 | 6 |  |
| **Composite cardiovascular endpoints during follow-up.** |  |  | 0.2 |
| No data available. | 0 (0%) | 0 (0%) |  |
| No composite endpoints | 586 (76%) | 1,287 (73%) |  |
| Composite endpoints | 189 (24%) | 476 (27%) |  |
| Unknown | 17 | 40 |  |
| **EP\_composite\_time** | 25.89 (648.29) | 2.49 (1.11) | 0.008 |
| Unknown | 20 | 40 |  |
| **Major cardiovascular events (endpoints) during follow-up.** |  |  | 0.15 |
| No data available. | 0 (0%) | 0 (0%) |  |
| No major events (endpoints) | 689 (89%) | 1,528 (87%) |  |
| Major events (endpoints) | 86 (11%) | 235 (13%) |  |
| Unknown | 17 | 40 |  |
| **EP\_major\_time** | 26.12 (648.29) | 2.74 (0.96) | 0.005 |
| Unknown | 20 | 40 |  |
| **MAC\_rankNorm** | 0.11 (1.00) | 0.21 (0.93) | 0.070 |
| Unknown | 265 | 624 |  |
| **SMC\_rankNorm** | 0.10 (0.97) | -0.13 (0.95) | <0.001 |
| Unknown | 268 | 625 |  |
| **Macrophages in the plaque (binned)** |  |  | <0.001 |
| no/minor | 348 (52%) | 626 (40%) |  |
| moderate/heavy | 327 (48%) | 932 (60%) |  |
| Unknown | 117 | 245 |  |
| **SMC in the plaque (binned)** |  |  | <0.001 |
| no/minor | 178 (26%) | 581 (37%) |  |
| moderate/heavy | 501 (74%) | 983 (63%) |  |
| Unknown | 113 | 239 |  |
| **Neutrophils\_rankNorm** | -0.29 (0.89) | 0.15 (0.95) | <0.001 |
| Unknown | 707 | 1,583 |  |
| **MastCells\_rankNorm** | -0.37 (0.97) | 0.12 (0.98) | 0.001 |
| Unknown | 727 | 1,626 |  |
| **Intraplaque Hemorrhage (based on the articles by W. Hellings and W. Peeters (Circulation)).** | 360 (53%) | 1,019 (65%) | <0.001 |
| Unknown | 114 | 232 |  |
| **VesselDensity\_rankNorm** | 0.03 (0.96) | 0.07 (0.99) | 0.4 |
| Unknown | 311 | 712 |  |
| **Calcifications in the plaque (binned)** |  |  | <0.001 |
| no/minor | 342 (49%) | 928 (58%) |  |
| moderate/heavy | 349 (51%) | 671 (42%) |  |
| Unknown | 101 | 204 |  |
| **Collagen in the plaque (binned)** |  |  | 0.5 |
| no/minor | 127 (20%) | 309 (22%) |  |
| moderate/heavy | 502 (80%) | 1,117 (78%) |  |
| Unknown | 163 | 377 |  |
| **Fat in the plaque (binned at 10%)** |  |  | <0.001 |
| <10% | 273 (40%) | 381 (24%) |  |
| >10% | 418 (60%) | 1,219 (76%) |  |
| Unknown | 101 | 203 |  |
| **Fat in the plaque (binned at 40%)** |  |  | <0.001 |
| <40% | 576 (83%) | 1,066 (67%) |  |
| >40% | 115 (17%) | 534 (33%) |  |
| Unknown | 101 | 203 |  |
| **OverallPlaquePhenotype** |  |  | <0.001 |
| atheromatous | 110 (16%) | 522 (33%) |  |
| fibroatheromatous | 247 (36%) | 594 (37%) |  |
| fibrous | 332 (48%) | 477 (30%) |  |
| Unknown | 103 | 210 |  |
| **Plaque\_Vulnerability\_Index** |  |  | <0.001 |
| 0 | 182 (23%) | 308 (17%) |  |
| 1 | 159 (20%) | 264 (15%) |  |
| 2 | 198 (25%) | 371 (21%) |  |
| 3 | 171 (22%) | 487 (27%) |  |
| 4 | 68 (8.6%) | 272 (15%) |  |
| 5 | 14 (1.8%) | 101 (5.6%) |  |
| **PCSK9\_plasma** | 35,096 (19,939) | 30,567 (18,170) | <0.001 |
| Unknown | 441 | 1,054 |  |
| **PCSK9\_plasma\_rankNorm** | 0.17 (1.05) | -0.08 (0.99) | <0.001 |
| Unknown | 441 | 1,054 |  |
| 1n (%); Mean (SD) | | | |
| 2Pearson's Chi-squared test with simulated p-value  (based on 2000 replicates); Fisher's Exact Test for Count Data with simulated p-value  (based on 2000 replicates); Wilcoxon rank sum test | | | |