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## CAROTID AND FEMORAL ATHEROSCLEROSIS IN ANTIPHOSPHOLIPID SYNDROME: EQUIVALENT RISK WITH DIABETES MELLITUS IN A CASE-CONTROL STUDY

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**Background** Antiphospholipid syndrome (APS) may carry a worse prognosis for vascular complications when co-existing with subclinical atherosclerosis, however, the association between the two conditions remains ambiguous.

**Methods** We evaluated ultrasonographic markers of subclinical atherosclerosis in carotid and femoral arteries of 86 patients with thrombotic APS (43 primary APS (PAPS), 43 systemic lupus erythematosus-associated APS [SLE/APS]), 86 patients with diabetes mellitus (DM) and 86 healthy controls, individually matched for age and gender, and investigated their associations with traditional and disease-related factors in APS.

**Results** Carotid plaques were found in 28% of PAPS, 23% of SLE/APS, and 30% of DM patients versus 9% of controls (p=0.006). Femoral plaques were found in 33% of PAPS, 19% of SLE/APS, 20% of DM, and 9% of controls (p=0.032). Multivariate regression-derived relative risk estimates for atherosclerotic plaques in any location were 2.72 for PAPS, 2.63 for SLE/APS, and 1.98 for DM (p=0.004, 0.009, 0.032 respectively), after adjusting for age, gender, hypertension, dyslipidemia, smoking, BMI, and family history of coronary disease. Among patients with APS, atherosclerotic plaques were associated with the number of traditional CVD risk factors in both PAPS (RR=2.75, p<0.001) and SLE/APS (RR=1.84, p<0.001), and with IgG anti-beta2-glycoprotein I antibodies in SLE/APS.

**Conclusions** Patients with PAPS and SLE/APS have a nearly 2.5-fold risk of atherosclerotic plaques in carotid and femoral arteries compared to healthy controls, similar to DM patients. Atherosclerotic plaques are associated with the number of traditional risk factors in both APS and SLE/APS, and with IgG anti-beta2-glycoprotein I antibodies in SLE/APS.

**Abstract PS4:68 Table 1** Baseline characteristics of study participants and vascular ultrasonagraphic findings by disease group

| | APS, n=86 | | DM | Controls |
|---|---|---|---|---|
| | PAPS n=43 | SLE/APS n=43 | n=86 | n=86 |
| *Baseline characteristics* | | | | |
| Age (mean±SD) | 46.4± 12.6 | 46.4 ± 10.9 | 46.7± 12.0 | 46.4± 12.1 |
| Gender (% female) | 63 | 84 | 73 | 73 |
| Disease duration [median (Q1, Q3)] | 7(2, 15) | 11 (4, 19) | 14 (6, 21) | |
| Hypertension (%) | 32 | 26 | 37 | 28 |
| Dyslipidemia (%) | 23 | 21 | 37 | 15 |
| Smoking (% ever) | 56 | 58 | 59 | 42 |
| Smoking (pack years) | 14 ± 18 | 12 ± 19 | 16 ± 22 | 7 ± 13 |
| BMI (kg/m2) | 29.1± 4.8 | 26.7 ± 6.2 | 29.6± 8.2 | 26.7 ± 5.1 |
| Family history of premature CAD (%) | 7 | 7 | 14 | 12 |
| Number of traditional CV risk factors except DM (%) | | | | |
| - 0-1 | 23 | 49 | 40 | 53 |
| - ≥ 2 | 77 | 51 | 60 | 46 |
| Anti-cardiolipin IgG positivity (%) | 67 | 79 | | |
| Anti-cardiolipin IgM positivity (%) | 53 | 60 | | |
| Anti-β2-glycoprotein I IgG positivity (%) | 56 | 47 | | |
| Anti-β2-glycoprotein I IgM positivity | 44 | 44 | | |
| Lupus anticoagulant positivity | 74 | 72 | | |
| Triple antiphospholipid antibody positivity | 44 | 51 | | |
| Statin current (%) | 21 | 12 | 30 | 11 |
| Antiplatelet agents, current (%) | 33 | 47 | 14 | 0 |
| Systemic anticoagulation, current (%) | 91 | 79 | 0 | 2* |
| Hydroxychloroquine, current (%) | 21 | 63 | - | - |
| Corticosteroids, current (%) | 12 | 65 | - | - |
| Immunosuppressives, current (%) | 14 | 47 | - | - |
| *Vascular Ultrasound Findings* | | | | |
| LCCA IMT (mean±SD) | 0.669±0.119 | 0.627±0.147 | 0.704±0.177 | 0.655±0.139 |
| LCCA IMT > 0.9 mm (%) | 5 | 8 | 31 | 23 |
| Atherosclerotic plaques (%) | | | | |
| - Carotid arteries | 28 | 23 | 30 | 9 |
| - Femoral arteries | 33 | 19 | 20 | 9 |
| - Any site | 44 | 28 | 34 | 15 |

* Two of the control subjects were on anticoagulation for atrial fibrillation without CAD. APS: Antiphospholipid syndrome; DM: Diabetes Mellitus; PAPS: Primary APS; SLE/APS: Systemic Lupus Erythematosus with APS; Q1: 1st quartile; Q3: 3rd quartile; BMI: Body mass index; CAD: Coronary artery disease; CKD: Chronic kidney disease; LCCA IMT: Left Common Carotid Artery Intima-Media Thickness

**Abstract PS4:68 Table 2** Relative risk of increased atherosclerotic plaque numbers conferred by participant disease group versus controls, after adjusting for the effect of traditional CV risk factors

| | Relative risk* | 95% Confidence Interval | p-value |
|---|---|---|---|
| Carotid and femoral plaques | | | |
| PAPS | 2.72 | 1.37 – 5.40 | 0.004 |
| SLE/APS | 2.63 | 1.28 – 5.41 | 0.009 |
| DM | 1.98 | 1.06 – 3.67 | 0.032 |
| Carotid plaques | | | |
| PAPS | 2.36 | 1.01 – 5.52 | 0.047 |
| SLE/APS | 2.86 | 1.20 – 6.83 | 0.018 |
| DM | 2.87 | 1.36 – 6.07 | 0.006 |
| Femoral plaques | | | |
| PAPS | 2.44 | 1.14 – 5.20 | 0.021 |
| SLE/APS | 1.91 | 0.84 – 4.38 | 0.124 |
| DM | 1.08 | 0.49 – 2.37 | 0.844 |

*Estimates derived from multiple negative binomial regression controlling for the effect of age, gender, hypertension, body mass index, pack years of smoking, family history of premature coronary artery disease
PAPS: Primary Antiphospholipid Syndrome; SLE/APS: Systemic Lupus Erythematosus with Antiphospholipid Syndrome; DM: Diabetes Mellitus

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