

# Directly quantified abdominal subcutaneous adipose tissue volume is negatively associated with subclinical coronary artery disease in men with psoriasis

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**Background:** Psoriasis is a common chronic inflammatory condition associated with an increased risk of obesity and higher coronary atherosclerosis burden by coronary computed tomography angiography (CCTA). Prior studies have shown that the ability to expand subcutaneous adipose tissue (SAT) may serve to identify individuals at a lower risk of atherosclerotic cardiovascular disease. However, the relationship between abdominal SAT and high-risk subclinical coronary artery disease requires exploration.

**Purpose:** To characterize the relationship between abdominal SAT volume measured on low-dose computed tomography, and coronary artery disease assessed as noncalcified and lipid-rich necrotic core burden by CCTA in psoriasis.

**Methods:** We performed a cross-sectional study of 232 participants with psoriasis and without known cardiovascular disease. All participants underwent CCTA to characterize coronary artery disease burden and low dose abdominal computed tomography to quantify subcutaneous adipose tissue volumes. Fat depot volumes were first adjusted in a sex specific manner for each participant's body mass index in a linear regression model. The residual values from the sex stratified linear regression models were used for analyses. Coronary artery disease burden was quantified in the three

main coronary arteries (QAngio, Medis, The Netherlands) and averaged. Analyses were performed with StataC 16 (Stata Corp., College Station, TX, USA).

**Results:** Of the 232 participants, 92 (40%) were women and the average age was 50 years. In women, there was a positive correlation between abdominal SAT and systemic inflammation as assessed by hs-CRP ( $r=0.30$ ;  $p=0.004$ ) and GlycA ( $r=0.29$ ;  $p=0.007$ ) as well as total cholesterol ( $r=0.24$ ;  $p=0.02$ ) and LDL cholesterol ( $r=0.22$ ;  $p=0.04$ ). In men, abdominal SAT correlated with hs-CRP ( $r=0.18$ ;  $p=0.04$ ) and insulin resistance as assessed by the homeostatic model for insulin resistance ( $r=0.17$ ;  $p=0.04$ ). In models fully adjusted for traditional cardiovascular risk factors, abdominal SAT volume negatively associated with noncalcified and lipid-rich necrotic core burden in men ( $\beta=-0.17$ ;  $p=0.03$ ,  $\beta=-0.21$ ;  $p=0.02$ , respectively), but not women ( $\beta=-0.04$ ;  $p=0.72$ ,  $\beta=0.05$ ;  $p=0.68$ , respectively) with psoriasis (Table).

**Conclusions:** In psoriasis, for a given body mass index, abdominal SAT negatively associated with coronary atherosclerosis burden in men. The observed sex-specific effects on subclinical coronary artery disease warrant further study of abdominal SAT in states of chronic inflammation.

**Table. Sex stratified associations between adjusted abdominal subcutaneous adipose tissue volume and coronary atherosclerosis burden**

	Noncalcified burden				Lipid-rich necrotic core burden			
	Women		Men		Women		Men	
	Stand. $\beta$	P Value	Stand. $\beta$	P Value	Stand. $\beta$	P Value	Stand. $\beta$	P Value
Unadjusted	0.04	0.72	-0.18	<b>0.04</b>	0.04	0.69	-0.22	<b>0.01</b>
Model 1	-0.04	0.72	-0.17	<b>0.03</b>	0.05	0.68	-0.21	<b>0.02</b>
Model 1 + VAT BMI Adjusted	-0.04	0.72	-0.21	<b>0.01</b>	0.05	0.67	-0.24	<b>0.008</b>

Adipose tissue volumes have initially been adjusted for each participant's body mass index in a sex stratified manner. Model 1: Adjusted for age, smoking status, total cholesterol, high-density lipoprotein cholesterol, diastolic blood pressure, hypertension treatment, lipid-lowering therapy, biologic therapy, and high-sensitivity c-reactive protein. Stand. B; Standardized beta from linear regression. SAT; subcutaneous adipose tissue. VAT; visceral adipose tissue. BMI; body mass index.