The Vascular Inflammation in Psoriasis (VIP) Trial:
FDG PET-CT is a Novel Tool for Quantification of Skin Inflammation

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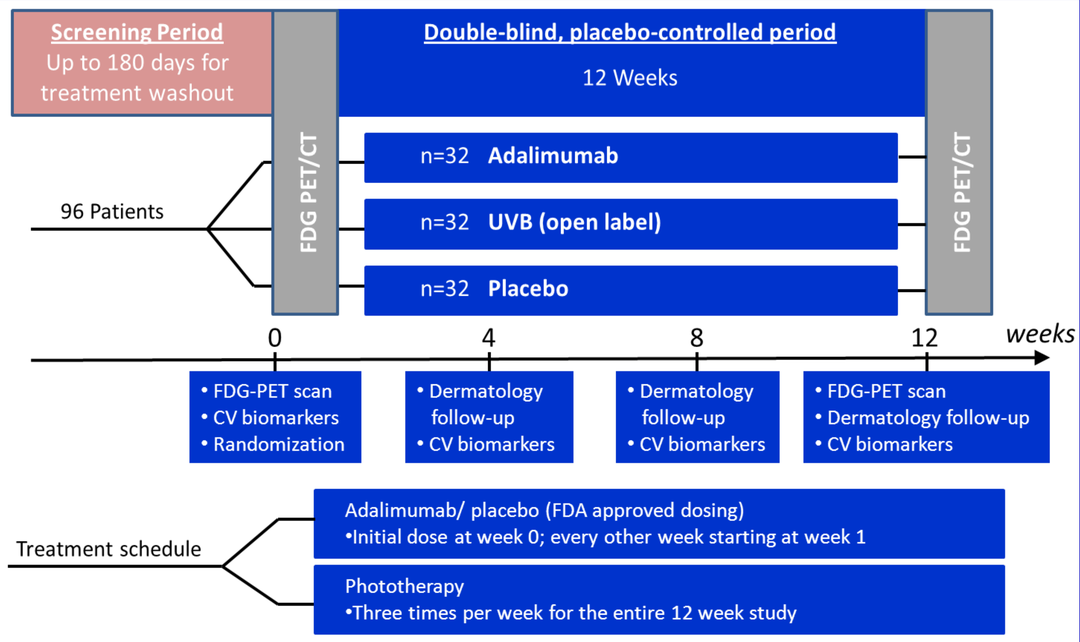
Introduction

- Psoriasis is a chronic inflammatory disorder of the skin that affects 2-3% of the population.
- While there are several clinical measures of psoriasis disease activity, no objective biomarkers of disease activity currently exist.
- 18-Fluorodeoxyglucose positron emission tomography-computed tomography (FDG PET-CT) is a powerful molecular imaging technique that highlights metabolically active tissues labeled by preferential uptake of 18-FDG by high-glucose-utilizing cells such as cancer and inflammatory cells. Thus, FDG PET-CT is a promising tool for imaging chronic inflammatory conditions such as psoriasis.
- In this proof-of-concept study, we present preliminary data quantifying the metabolic activity of psoriatic skin as measured by FDG PET-CT in a subject enrolled in the Vascular Inflammation in Psoriasis (VIP) trial and randomized to the open label phototherapy arm.

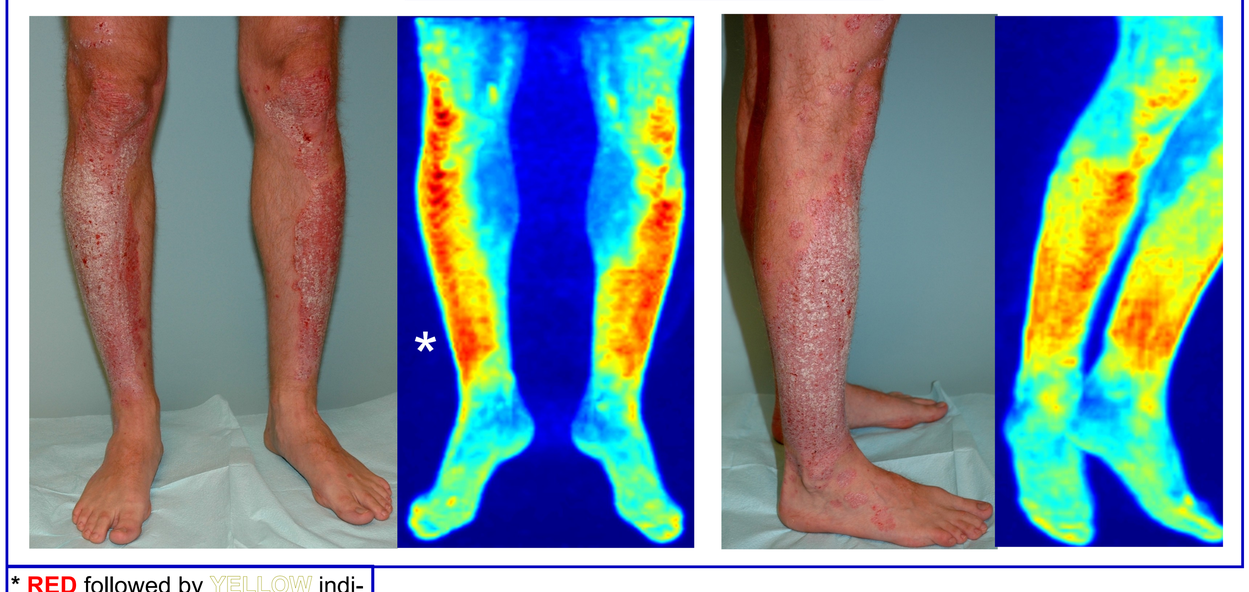
Methods

- The VIP study is a multi-center, 3-arm (narrow-band UVB vs. adalimumab vs. placebo), randomized, double-blind, placebo-controlled, 12-week clinical trial enrolling 96 subjects with moderate to severe psoriasis at 6 sites (University of Pennsylvania as coordinating center).
- The primary endpoints are vascular inflammation as measured by FDG PET-CT and sophisticated biomarkers of CV risk.
- As an exploratory endpoint (data presented here), inflammatory and metabolic activity of the skin was measured by FDG PET-CT using 3DViewnix software.
- Mean metabolic volume product (MVP_{mean}) was calculated for the lower extremeties. MVP_{mean} = (total volume of psoriatic plaques) x (mean standard uptake value (SUV) of all psoriatic lesions) = index of overall psoriasis extent and activity.



Results

Week 0: Baseline



* **RED** followed by YELLOW indicate areas of greatest metabolic activity.

Week 12: After 33 sessions of nb-UVB

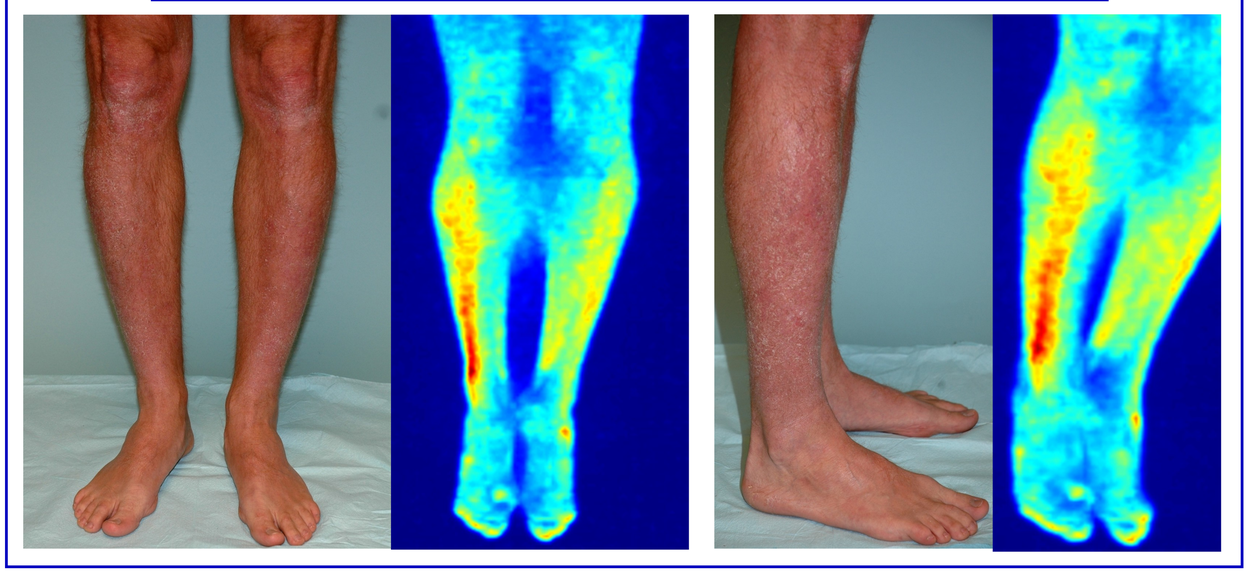


Table 1. Mean metabolic volume product (MVP_{mean}) vs. BSA vs. PASI scores for the lower extremities.

MVP_{mean} (SUV-mL)		BSA		PASI	
Week 0	Week 12	Week 0	Week 12	Week 0	Week 12
234.3	67.6	13	6	9.6	1.6

Conclusions

- In a subject with moderate to severe psoriasis treated with 33 sessions of nb-UVB phototherapy over 12 weeks, changes in BSA (53.8% decrease) and PASI (83.3% decrease) are paralleled by a similar change in MVP_{mean} (71.1% decrease) as determined by FDG PET-CT.
- In general, preliminary MVP_{mean} values of our psoriasis study subjects are similar to what is observed in patients with osteo- and rheumatoid arthritis.
- FDG PET-CT can be used to objectively quantify psoriasis skin activity and may be a powerful biomarker of psoriasis activity.

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