Treprostinil Iontophoresis in Idiopathic Pulmonary Arterial Hypertension

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Abstract:

Idiopathic pulmonary arterial hypertension (PAH) is a progressive disease without identifiable etiology and is characterized by elevated pulmonary vascular resistance that can lead to right heart failure and death (1). Initial studies characterized idiopathic PAH (IPAH) as a disease of the pulmonary circulation; however, recent data from us (2, 3) and other investigators (4–6) showed evidence of extrapulmonary vascular involvement. The extrapulmonary microcirculation can be studied in vivo, using cutaneous laser Doppler flowmetry (7), a methodology that can measure changes in skin flow in response to vasoactive stimuli. One stimulus is the cutaneous administration of prostacyclin (PGI2), using iontophoresis. Patients with IPAH have a marked reduction in PGI2 synthase (8) and expression of prostaglandin I2 receptors (9) in the lungs. More important, PGI2 analogs are potent medications to treat IPAH. Treprostinil is a PGI2 analog that increases cutaneous blood flow when administered by cathodal iontophoresis to healthy volunteers (10) and patients with systemic sclerosis (11). We hypothesize that patients with IPAH have systemic abnormalities in the PGI2 pathway that can be tested in vivo by cutaneous treprostinil iontophoresis.

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