Raynaud's syndrome presents a number of difficulties and confusions for primary care physicians. At least some of the ‘mystique’ of the condition is due to the changing nomenclature. In 1862, the year he received his medical degree in Paris, Maurice Raynaud published his inaugural thesis, ‘Sur l’asphyxie locale et la gangrène’ [1], and henceforth the widely recognized clinical entity of extremity vasospasm became known as Raynaud's disease. Raynaud's original 25 patients exhibited digital gangrene despite the presence of palpable wrist pulses and Raynaud himself proposed that the underlying abnormality producing such severe vasospasm was sympathetic nerve overactivity. This theory held sway for almost a century but is incorrect. Not only do these patients not have systemic sympathetic overactivity but vasospasm alone does not result in digital gangrene.

In 1901, Hutchinson [2] recognized that a number of diverse conditions may manifest as digital ischemia e.g. atherosclerosis, scleroderma etc., and redefined the disease as a phenomenon. This was further clarified by Allen and Brown [3] who defined Raynaud's disease as idiopathic and Raynaud's phenomenon as being a manifestation of a more serious and potentially more progressive underlying disease process. Allen and Brown were attempting to distinguish between those patients who followed a benign course and those patients who progressed to develop tissue loss of the digits. However, with increasingly sophisticated immunologic testing, an increasing proportion of patients are recognized to have, or eventually to develop evidence of, an underlying autoimmune disorder. Thus, the misleading primary Raynaud's disease and secondary Raynaud's phenomenon are now replaced with the more encompassing term of Raynaud's syndrome.

Clinical presentation

Raynaud's syndrome is episodic vasospasm of the digits, usually of the upper limb but occasionally of the lower limb as well. The digits between attacks are generally normal in terms of color, temperature and sensation. The attacks typically begin in adolescence and are initiated by exposure to cold and emotional stimuli and are usually completed 15 to 60 minutes after cessation of the stimulus. The classical triad of color changes of pallor, cyanosis and rubor may be evident but often one of the latter two color changes is less obvious. The vasospasm of Raynaud's syndrome...
is symmetrical and about 90% of those who seek medical advice are female. Paresthesia and mild discomfort, especially during the rubor phase are common but overt pain is rare in the absence of ischemic ulceration. Digital tissue loss does not occur with vasospasm alone but indicates structural change and anatomical obstruction of digital and palmar arteries is present with a correspondingly worse prognosis.

Pathophysiology

Lewis [4, 5] proposed that vascular wall hyperresponsiveness to cold was due to a ‘local fault’ in the vessel. His experiments involved local anesthetic blocks of both somatic and autonomic nerves. These blocks did not prevent vasospasm in response to cold stimuli. Maurice Raynaud’s theory of a hyperactive sympathetic nervous system appeared to be disproved yet cervical sympathectomy continued to be used because of the beneficial results observed. Although an initial hyperemia is observed, vasospasm can still be precipitated albeit with a more severe cold stress. The overall results however are disappointing, particularly in the longer term.

If the adrenergic system is involved in the production of vasospasm, then either there is an excessive abundance of the stimulating agent or there is an excessive response to stimulation. From the time of Lewis in the 1930s, the pendulum has swung toward the concept of excessive response. Coffman and Cohen [6] emphasized that digital blood flow either perfused the nutrient capillary bed or was shunted through arteriovenous communications. Cold stress applied to normal fingers resulted in decreased arteriovenous shunt flow but unaltered nutrient capillary blood flow, whereas in patients with Raynaud’s syndrome there was a reduction in both. More importantly, they showed that pretreatment with reserpine, a sympathetic blocking agent, resulted in increased nutrient capillary flow. This was amongst the first evidence suggesting that enhanced adrenergic neuroeffector activity had a role in the pathophysiology of Raynaud’s syndrome.

More recently attention has focused on α-adrenergic receptors in vascular smooth muscle, specifically α۱-adrenergic receptors. In 1983, Keenan and Porter [7] reported significantly elevated levels of α۱-receptors in circulating platelets in patients with vasospasm compared to controls and suggested a correlation may occur with vascular smooth muscle. The possibility of an increased receptor population provides a mechanism for a ‘final common pathway’ for a variety of stimuli. The concept of altered receptor population may have implications for other clinical entities involving vasospasm e.g., migraine, variant angina. Experimental work with regard to α-adrenergic receptors in general is continuing but of particular interest is the possibility that the population of receptors is not fixed but may be modulated by activity in response to stimuli.

From a practical point of view it is tempting to divide Raynaud’s syndrome into vasospasm and vaso-obstruction. However, patients, particularly if observed over a long period, tend to demonstrate features of both. It is likely that vasospasm and vaso-obstruction are merely opposite ends of the same spectrum and thus such separation is artificial. Certainly the two processes are not mutually exclusive.