

had, however, features of SS accompanied by marked swelling of both parotid and submandibular glands and severe PHT later complicated by right heart failure. She died suddenly several months later. In addition to the references cited in the case report,<sup>1</sup> we were able to identify a further patient with PHT and SS.<sup>3</sup>

PHT in association with connective tissue disease occurs most commonly with progressive systemic sclerosis (particularly the CREST variant (calcinosis, Raynaud's phenomenon, oesophageal dysmotility, sclerodactyly, telangiectasia)), in SLE, and in mixed connective tissue disease. In SLE it usually manifests as PHT indistinguishable from the 'primary' idiopathic type and is rarely of the thromboembolic variety.<sup>4</sup> It is considerably rarer in association with other connective tissue diseases, such as rheumatoid arthritis, when it may be more frequently associated with pulmonary vasculitis. It is excessively rare in conditions such as dermatomyositis and discoid LE. Its occurrence in primary SS may perhaps provide clues as to its pathogenesis. An interesting hypothesis concerning the relation between hypothyroidism and PHT has recently been postulated by Chin and Fisher.<sup>5</sup> Several factors may contribute.

Clotting factors are typically raised in hypothyroidism<sup>6</sup> and may contribute to a relatively hypercoagulable state, resulting in in situ microvascular thrombosis. More importantly, norepinephrine, which may cause systemic and pulmonary vasoconstriction, is increased in hypothyroidism.<sup>7-9</sup> This may result from a diminution in the number of alpha and beta receptors. Increases of pulmonary artery norepinephrine concentrations have also been found in patients with increased pulmonary venous and arterial pressures.<sup>10</sup> Chin and Fisher found that three out of 25 of their patients with unexplained PHT had evidence of hypothyroidism. This prevalence of 12% is far higher than that of hypothyroidism in the general population, which ranges from 0.4 to 5.9%.<sup>11, 12</sup> Additionally, they found a further seven patients with connective tissue disorders and PHT who also showed evidence of hypothyroidism.

There is also an association between Raynaud's phenomenon, common in patients with PHT, and hypothyroidism,<sup>13</sup> as well as evidence, recently confirmed, of the efficacy of triiodothyronine in patients with Raynaud's phenomenon,<sup>14</sup> relieving vasospasm both subjectively and objectively.<sup>15, 16</sup>

The frequent occurrence of organ specific antibodies to constituents of thyroid as well as clinical Hashimoto's thyroiditis in patients with SS<sup>17, 18</sup> leads one perhaps to speculate on a common link between these conditions.

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## Note

### Volvo awards for low back pain research 1989

The Volvo Company of Göteborg, Sweden will again this year sponsor three prizes of US \$8000 each. Original reports within the following three areas: clinical studies, bioengineering studies, other basic science areas, must reach the address below by 15 November 1988. Further information from Professor A Nachemson, Department of Orthopaedics, Sahlgren Hospital, S-413 45 Göteborg, Sweden.