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Clinical correlates of angiographically diagnosed idiopathic pulmonary hypertension

We read with great interest the report by Dr H H Gray and his colleagues (June 1990;45: 442–6). Several points are raised which, we feel, merit comment and, hopefully, clarification. The most critical one is the distinction between what we prefer to call major vessel chronic thromboembolic pulmonary hypertension and small vessel idiopathic pulmonary hypertension.

This distinction has major management implications. The most vital one is that chronic thromboembolic pulmonary hypertension is potentially subject to surgical correction by thromboendarterectomy; idiopathic pulmonary hypertension is not. Furthermore, as Dr Gray and colleagues note, medical management of the latter often is not successful, with transplantation as the "final option." We have evaluated and followed more than 220 patients with major vessel, chronic thromboembolic pulmonary hypertension who have undergone pulmonary thromboendarterectomy[1]; our experiences in making this diagnosis may be germane.

One of the central problems in determining the diagnosis has been the terminological confusion created by the World Health Organisation classification of idiopathic pulmonary hypertension, a classification which has outlived its usefulness. Particularly troublesome is the uncertainty introduced by the "thromboembolic" subcategory.

We would submit that a "1990s" classification would be "small vessel pulmonary hypertension" and "large vessel thromboembolic pulmonary hypertension." In the first category are patients whose pulmonary hypertension arises from obstruction in the small, distal "resistance" vessels of the lung. Various lesions cause such obstruction, as has been amply demonstrated. Among these are so called "thrombotic" lesions. In our view patients with such lesions should no longer be described as having thrombo*embolic* pulmonary hypertension as no evidence for embolism has been offered. More likely, such lesions arise in situ from endothelial injury.

In the second category are patients whose pulmonary hypertension arises from obstruction of the large *elastic* arteries (main, lobar, segmental). These organised obstructing thrombi arise, in virtually every patient, from embolisation of venous thrombi. This distinction is not only pathogenetically more useful; it is also operationally critical. Patients in the second category can be substantially aided (even "cured") by thromboendarterectomy; patients in the former category cannot.

Other considerations follow once this distinction is made: anticoagulation in true thromboembolic ("large vessel") hypertension is, in our view, essential. The same can be said of Greenfield filter placement, to protect against further embolism in patients with substantial, large vessel thromboembolic pulmonary hypertension. As Mansour *et al* and others have noted, the morbidity and mortality of this procedure is negligible (in contrast with caval ligation or plication). In small vessel hypertension the value of anticoagulation is much less certain and filter placement is not indicated in the absence of venous thrombosis. We agree with Dr Gray and colleagues that differentiating the two conditions is difficult and frequently impossible on clinical grounds. We have, however, found a much higher frequency of a history compatible with deep venous thrombosis or pulmonary embolism (over half of all patients) in cases of major vessel obstruction (perhaps this is because one of us has taken the history in each of these cases).[2] There also is one distinctive physical finding in large vessel thromboembolic pulmonary hypertension: a flow murmur (as in congenital pulmonary artery branch stenosis), due to partial obstruction by a chronic thrombus; one or more of these murmurs can be heard *over the lung fields during breath holding* in some 30% of patients. We have not heard such murmurs in patients with small vessel pulmonary hypertension.

As Dr Gray and colleagues have suggested, the perfusion lung scans and pulmonary angiograms in these two groups differ substantially. In regard to perfusion lung scans, we have not found segmental or larger perfusion defects in patients with small vessel pulmonary hypertension. All patients with major vessel chronic thromboembolic pulmonary hypertension have had one (usually more and larger) such defect. (But commonly the perfusion scan defects *underestimate* the extent of major vessel obstruction.)

The key test is, of course, the pulmonary angiogram. It is quite distinctive in the two conditions. In small vessel pulmonary hypertension patent and normally tapering elastic arteries are seen, with "pruning" of the small, distal vessels (that is, no "capillary" blush). In large vessel chronic thromboembolic pulmonary hypertension various patterns are seen in the central arteries: frank obstruction, peculiar taperings and irregularities, webs, and bands. These many patterns reflect the variability in the way in which central (main, lobar, segmental) thrombotic occlusions organise and recanalise. Direct fibreoptic angioscopy helps diagnosis occasionally.

We concur that lung biopsy does not help to distinguish the two conditions. All the small vessel lesions "characteristic" of small vessel pulmonary hypertension can be found in major vessel thromboembolic pulmonary hypertension and in other disorders associated with pulmonary hypertension.[3] Biopsy therefore may obfuscate rather than elucidate the diagnosis. History taking, lung scanning, pulmonary angiography, and angioscopy are the most useful techniques for obtaining a diagnosis.

Because of the major management implications of making the correct diagnosis, we hope that the confusion evoked by "mixing" large vessel thromboembolic pulmonary hypertension with small vessel pulmonary hypertension (in which thrombotic lesions may occur) can be dissipated; patients with the former, potentially remediable, condition can then be recognised and managed appropriately.

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AUTHOR'S REPLY We welcome the comments of Professor Moser and his colleagues, whose experience in the field of idiopathic pulmonary hypertension is well known. Our paper was a retrospective review of patients presenting with unexplained pulmonary hypertension and as such suffers from certain weaknesses. Our finding of a lower incidence of prior deep venous thrombosis or pulmonary embolism in the group with asymmetrical pulmonary arteriopathy than that in Professor Moser's group, and the absence of pulmonary flow murmurs in the case records, may represent one of these weaknesses as the incidence of these findings would almost certainly be higher in a prospective study when someone with a particular interest in the subject makes the clinical assessment.

We agree entirely with their comments concerning the distinction between patients with idiopathic pulmonary hypertension. The histological differentiation into the three WHO categories (primary plexogenic, thromboembolic, and pulmonary veno-occlusive disease) may be difficult and indeed makes the assumption that there are in fact three separate disease entities, whereas it may be that a range of diseases exists. Such a differentiation is often clinically unhelpful and, as clinicians, we agree that until the aetiologies of idiopathic pulmonary hypertension are more clearly defined it may be more helpful to make distinction between patient groups based on therapeutic options. The distinction that Professor Moser and his colleagues use in dividing patients into those with small and large vessel pulmonary obstruction has a lot to recommend it from a therapeutic point of view and has the additional advantage that patients are not given a diagnostic label that is based on speculation about the causes of their pulmonary hypertension. If the causes of idiopathic pulmonary hypertension become clearer and if an imaging or pathological technique becomes available that reliably separates patients into these aetiological groups, the patient can be given an accurate diagnosis. Until then a distinction based on therapeutic groupings would have more practical benefit.

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Antemortem recognition of brain metastases in malignant mesothelioma

Drs M Huncharek and J Muscat report that antemortem diagnosis of central nervous system metastases from pleural mesothelioma is rare, with only three reports of antemortem diagnosis (July 1990;45:571). I suspect that this is due to underreporting rather than to the rarity of the condition. Indeed, on the day I read the article I received a necropsy report