Polyarteritis nodosa and acute interstitial pneumonia

Sir: Although about eight reports of patients with polyarteritis nodosa associated with interstitial pneumonia have been published, it appears that interstitial pneumonia has not been considered to be a complication of polyarteritis nodosa. Of the eight cases with this association, only two cases have been recorded in English publications. Thus we present one case of polyarteritis nodosa associated with acute interstitial pneumonia.

A 71 year old man was admitted to the hospital on 2 October 1990. He had complained of fatigue, weight loss, fever, and cough for two months before admission. His temperature was 39°C and oedema of the legs was noted. Abnormal laboratory data included a white blood cell count of 14.5 × 10^9/l (normal range 4.0-8.0 × 10^9/l) with neutrophilia, haemoglobin concentration 103 g/l (140-180 g/l), erythrocyte sedimentation rate 31 mm/h (0.7-11 mm/h), C reactive protein 1.5 (0.0-0.5 mg/l), and serum complement C3 (CH50) 18.8 U/ml (30.0-40.0 U/ml). Both rheumatoid factor and antinuclear antibody were positive. Patient B surface antigen and antibodies were negative. Cryoglobulins were negative. A chest radiograph was normal. It was considered diagnostically possible as polyarteritis nodosa and was treated with corticosteroids (prednisolone 60 mg/day). Two months later both rheumatoid factor and antinuclear antibody were negative, and CH50 had returned to normal.

On 4 January 1991 he complained of dyspnoea. Arterial blood gas analysis at room air showed a partial pressure of oxygen (Pao2) of 32 mmHg, partial pressure of carbon dioxide (Paco2) 32-7 mmHg, bicarbonate 23-4 mmol/l, and pH 7-5. The chest radiograph showed a diffuse reticular pattern in both lungs. Although he was treated with a large dose of corticosteroids (1 g of prednisolone a day for six days) based on the clinical diagnosis of acute interstitial pneumonia, he died of respiratory failure on 15 January 1991.

Necropsy showed polyarteritis nodosa affecting multiple organs, including the lung, oesophagus, stomach, intestine, liver, spleen, kidney, pancreas, and testis. In the lung the bronchial and pulmonary arteries were affected. Most marked were the changes in the stomach. The arteries along the greater and lesser curvatures of the stomach contained numerous nodules, often arranged in chains like a string of pearls. Moreover, many nodules produced protuberances of the gastric mucosa so that the inner surface of the stomach appeared nodular. Histologically, the affected arteries represented the scar stage of necrotising arteritis according to our classification. Collapse of the alveolar sacs and dilatation of the alveolar ducts could be seen in all lobes of both lungs (fig 2). Hyaline membrane formation, fibroblast proliferation, and chronic inflammatory cell infiltrate were present in the alveolar septae. Moreover, cuboidalisation of the alveolar lining cells and thickened pulmonary arteries were noted. These findings correspond to acute interstitial pneumonia. There was no correlation between interstitial pneumonia and arteritis. Although interstitial pneumonia was associated with collagen vascular diseases as described, it was believed that polyarteritis nodosa is not complicated with interstitial pneumonia. Recently, Carratalá and coworkers presented two cases of polyarteritis nodosa associated with interstitial pneumonia, and suggested that reports of new cases were needed to determine whether or not this association is real.

Our case represents classic polyarteritis nodosa, indicated by nodule formation, with histological evidence of arteritis of polyarteritis nodosa type. Nodules were originally described, hence the term polyarteritis nodosa, but these nodules are frequently seen today, either clinically or pathologically. In the present case the arteritis represented the scar stage. On the other hand, the interstitial pneumonia corresponded to the acute stage. Thus we think that interstitial pneumonia overlapped the pre-existing polyarteritis nodosa in this case.

A nationwide research team was organised under the auspices of the Ministry of Health and Welfare of Japan in 1973 to investigate polyarteritis nodosa. The research team analysed 56 patients with polyarteritis nodosa, of whom 10 (18%) clinically had interstitial pneumonia. Moreover, our own experience of three patients with polyarteritis nodosa (the present one and two previously reported) showed that two had interstitial pneumonia. These findings indicate that polyarteritis nodosa associated with interstitial pneumonia is apparently more common than has previously been recognised. Thus during treatment of polyarteritis nodosa it may be necessary to treat overlapping interstitial pneumonia.

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Letters to the editor


Radiographic assessment of the knee joint in OA

Sir: The article of Cooper et al, on reproducibility of radiological assessment of the knee joint in osteoarthritis, considers a subject integral to the science of rheumatology. The surprisingly poor reproducibility of the cardinal radiological sign of osteoarthritis (osteophytes) in this Bristol Study contrasts with the observations of Altman’s 15 centre study. Experienced rheumatologists took part in the latter, whereas four of the five observers in the Bristol Study were trainees. The poor reproducibility from three of the five observers raises an intriguing possibility. Does the study actually consider the effectiveness and reproducibility of rheumatologists in interpreting radiographs, or solely the efficacy of a particular training programme in teaching the skills in question?

Failure to observe differential reproducibility of joint space assessment between medial and lateral knee compartments was most perplexing. This suggests that the Bristol team observers were no more accurate in assessing the ‘normal’ compartment of the joint than the ‘affected’ compartment. Combination of data from ‘normal’ and osteoarthritic compartments seems even to underestimate the original premise that this was a study of osteoarthritis.

If Samuel Clemens (Mark Twain) is correct that statistics can be considered as one of the various forms of lies, the failure to achieve statistical significance may be misleading. The blinded nature of the analysis may not overcome an apparent fundamental statistical premise violation, related to non-random selection of who reviewed which films. β Error (related to limited sample size) and phenomenon infrequency (making use of χ² inappropriate) further compromise interpretation.

The comments of the reviewers of a difference in order of appearance and of clustering of findings and use of the peculiar ill-defined phrase ‘abnormality of bony contour’ raise an intriguing possibility, as only osteophytes have actually been demonstrated as a reliable radiological sign of osteoarthritis. Do the differential appearance order and clustering indicate that perhaps we have been grouping phenomenon with osteoarthritis that are at best tangential? Are we dealing with the traditional overlapping circles of phenomenon which so punctuate the epidemiological chapters in McCarty’s text?

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AUTHORS’ REPLY: We were interested to read Dr Rothschild’s comments on our study of radiological assessment of the knee joint in osteoarthritis. We agree that the reproducibility of these assessments is a subject integral to rheumatological research and practice. Although we cannot be expected to comment on the American College of Rheumatology study which is still in press, we are uncertain that the reproducibility with which osteophytes was assigned in our study was markedly different from that reported using a similar scale by Altman et al. The lowest intraclass correlation between observers for spurs in that study was 0.56, as compared with a x statistic of 0.58 in our study. Indeed, we emphasised in our paper that assessment of joint space narrowing and osteophyte in the tibiofemoral compartment performed rather better than did sclerosis and cyst formation. Dr Rothschild is correct that one of the reasons why reproducibility in our study might have been generally worse than in others relates to the observers chosen for the study. One of our specific aims, however, was to examine the assessment of these features in routine practice rather than to ascertain the optimum performances which could be attained by highly trained observers. Indeed, we highlighted the potential role of training to reduce observer variation as an area for further research.

We were unable to understand Dr Rothschild’s statistical comments. If he is lamenting the widespread use of statistical inference in biomedical research, space does not permit us to do more than profoundly disagree with him. The study was designed so that all the observers viewed all the radiographs unaware of their own or colleagues’ previous assessments. The statistical analysis of observer variation is controversial, but we chose to use the x statistic (rather than the χ² statistic as your correspondent implies). We took pains to emphasise the pitfalls of this analytical technique, but ultimately decided that a summary index of the concordance for various measurements justified its use. It remains one of the most widely used tools to assess the reproducibility of categorical scales.

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