P1 Blood Group, Pigeon Antigens, and Respiratory Disease

The P1 blood group antigen is a glycosphingolipid which is dominantly inherited. On the basis of the current structural data, there are two sets of alleles, one which adds the P1-specific sugar and the other which does not. Therefore, two phenotypes, P1 positive and P1 negative (or the P2 phenotype) are possible. About 20 percent of the white population is P1 negative, and the serum of those individuals may contain anti-P1 antibodies.

The demonstration of high titers of anti-P1 antibody in the serum of pigeon breeders led two groups of investigators to study the relationship between the P1-negative phenotype, anti-P1 antibody, and exposure to pigeon antigens. Radermecker et al. pursued the possibility that P1 blood group substance might be found on the erythrocytes in the serum and droppings of pigeons. Roland1 previously demonstrated P1 substance in gram-negative bacteria, and in the current study (see page 719), Effler et al. have examined pigeon droppings as a source of bacterial P1 substance which could have immunized breeders.

Although the methods used by the two groups differed slightly, the results were identical. Both groups found significant increases in the frequency of detectable anti-P1 antibody in the serum of P1-negative pigeon breeders when compared to controls. These antibodies were associated with the presence of serum precipitating antibodies directed against pigeon serum or an extract of pigeon droppings. Radermecker et al. found that anti-P1 antibody could be removed by absorption or neutralization with pigeon erythrocytes, pigeon serum, or pigeon-dropping extract, while Roland obtained the same results with pigeon-dropping extract and human P1-positive erythrocytes. This association of anti-P1 antibody and antibodies to pigeon serum and pigeon-dropping extract could have been the result of immunization by inhalation of avian antigens containing both serum proteins and P1 substance. Both groups of investigators also concluded that the presence of anti-P1 antibody was not associated with pigeon breeder’s disease, but that an increased frequency of respiratory disease was detected in the P1-negative individuals.

The study of Radermecker et al. suggests that the P1 antigen may not be just a bacterial contaminant of pigeon droppings but may be an integral component of various pigeon antigenic materials, since anti-P1 activity could be removed by absorption with pigeon erythrocytes and serum; however, the human response to P1 antigens appears different than the response to other pigeon proteins. Anti-P1 antibody is usually an IgM antibody and is rarely reactive at body temperatures, while antibodies against pigeon serum are normally IgG and reactive at body temperature. For these reasons, as well as those mentioned previously, it is unlikely that anti-P1 antibody is involved in the pathogenesis of pigeon breeder’s disease.

An interesting observation of both studies is the possible relationship between respiratory disease and the P1-negative phenotype. Both groups of investigators detected a significant number of individuals with respiratory disease of all types among those with anti-P1 antibody. The study of Radermecker et al. may have been biased, since some of their pigeon breeders were obtained through a respiratory disease clinic.

Since the P1 antigen has been found on fibroblasts and other tissues, it is possible that individuals negative for the P1 antigen may have a greater risk of respiratory disease due to changes in the surfaces of the membranes of the lung. Studies of populations of patients not selected for bird handling but rather for respiratory disease will be necessary to verify this. Perhaps the excess of anti-P1 antibody among pigeon breeders is a reflection of the increased respiratory trauma to which these individuals have been exposed, and similar findings may exist among all individuals with disease of the respiratory tract.

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REFERENCES

Fiberoptic Bronchoscopy in Bronchogenic Carcinoma

Kvale et al. (June 1976 issue of Chest) are to be given credit for updating the criteria for using various procedures associated with fiberoptic bronchoscopy in the diagnosis of bronchogenic carcinoma. In their analysis, Kvale and associates1 not only reviewed and compared more of the proce-
dures associated with bronchoscopy than did previous reports.\textsuperscript{2-5} but also and most important, for the first time, they analyzed only those cases in which a definite tissue diagnosis was made and in which atypical cytologic findings were not considered a criterion for a positive diagnosis. Kvale et al\textsuperscript{1} also compared the value of more of the diagnostic procedures associated with fiberoptic bronchoscopy (and done simultaneously) than did most other studies.

There still remain some unsettled points related to the study of Kvale et al.\textsuperscript{1} First, simple statistical analysis ($\chi^2$) does not bear out their conclusion that bronchial washing is not as productive as bronchial biopsy or brushing, although the probability is nearly acceptable for significance (this constitutes a plea for authors to confirm statements such as those about the comparative utility of diagnostic methods by statistical means, rather than by impressions). Secondly, while the arguments of Kvale et al\textsuperscript{1} that bronchial washing and postbronchoscopic sputum cytologic studies do not add “significantly” to the diagnostic yield in comparison to the effort and cost involved in obtaining them, it would not seem appropriate to discontinue their use on the basis of this one study; for example, in a series of our own, we found two cases out of 51 in which the diagnosis was made only on the basis of bronchial washings or postbronchoscopic sputum specimens or both, a small but possibly meaningful number. Thirdly, the number of patients with peripheral tumors in the series of Kvale et al\textsuperscript{1} were too few to adequately evaluate the efficacy of the procedures for this type of lesion, which the article recognized. Fourth, the authors did not compare the efficacy of procedures associated with bronchoscopy with the yield from prebronchoscopic sputum cytologic studies, which might significantly alter their conclusions by possibly obviating the need for bronchoscopy in many of the cases in which brushing and biopsy give a particularly high yield of positive findings.

It is interesting that our experience is similar to that of Kvale et al\textsuperscript{1} in some respects but is different in others. Importantly, we also found brushings and direct biopsies to be superior to all other procedures. Each yielded positive findings in approximately two-thirds of the tissue-proven cases, as in the series of Kvale et al,\textsuperscript{1} but it was our experience that brushings could be done in many more cases than biopsies (51 vs 38), so that brushing produced the largest number of positive findings. We also compared the utility of studying prebronchoscopic sputum specimens, which produced a relatively low number of positive findings (18 of 51); however, in several cases, such study obviated the need for bronchoscopy.

Further studies utilizing strict criteria for “positive” findings and comparing all diagnostic methods in the same group are indicated.

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Lung Disease (Where Are We Now?)

Answer: A lot farther than we were last year. Where will we be next year?—Clearly another step forward! These flamboyant statements are true and epitomize the current scene in pulmonary science and the practice of pulmonary medicine today. Recently, at the annual meeting of the American Thoracic Society held in New Orleans, the two editors of our most prominent journals in chest medicine, Drs. John H. Murray and Al Soffer, asked me to review the book Lung Disease (State of the Art).* I couldn’t have been more delighted! This is a compendium of major important reviews published in our sister journal, the American Review of Respiratory Diseases, during 1974-75, encompassing 14 articles by contemporary experts. These articles have been nicely bound and are offered as a state-of-the-art series and are dedicated to the continued enlightenment of those who know and care about lungs.