radiological features, suggesting extensive pulmonary disease and clinical evidence of activity. (3) Serial SACE measurement is a useful monitor of active sarcoidosis and its response to steroids.

82. A NEW METHOD FOR THE COMPUTER-ASSISTED DETERMINATION OF AIRWAYS RESISTANCE

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Conventional methods for determining airways resistance, based on the recording of plethysmographic pressure and flow as X-Y displays may yield inconsistent results since airways resistance is only one of a number of factors affecting the shape of such displays. Furthermore, subjective assessment, by eye, of the pressure-flow slope gives rise to large inter-observer variations. In order to obtain a more accurate measurement of resistance a mathematical model has been set up which includes coefficients characterizing resistance, gaseous inertance and the behaviour of the airways as compliant structures. A simple algorithm allows these coefficients to be deduced from measured pressure and flow signals. Measurements of resistance obtained with the new method correlate well with those obtained by the conventional method and exhibit improved reproducibility. The coefficient of variation of specific airways conductance is of the order of 10% for both normal subjects and patients with airways obstruction. The improved accuracy and speed of the new method has been found to be particularly useful in assessing the immediate response to lung irritants.

83. EFFECT OF BIPEDAL LYMPHOGRAPHY ON RESPIRATORY FUNCTION IN UNTREATED PATIENTS WITH MALIGNANT LYMPHOMA

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Bipedal lymphography is now an accepted investigation in the staging of malignant lymphoma and many other cancers. It differs from other radiological vascular investigations in that the contrast medium used is oily as opposed to water-soluble, and contrast which is not retained in the lymph nodes may obstruct the venous capillary blood supply to the lungs with reduction in respiratory function. This investigation was to assess the timing and degree of adverse respiratory effects after lymphography in patients with malignant lymphomas without overt evidence of parenchymal lung disease. Eleven patients were initially studied; respiratory function was checked before and 24 h after lymphography. A significant fall in transfer factor was confirmed in the group as a whole. Other respiratory function tests were not significantly affected. Further patients were studied sequentially before and 4, 8, 24, 48, 72, 96 and 120 h after lymphography. Falls in transfer factor occurred within hours of lymphography and persisted for several days.

These changes may have implications in the selection of patients for lymphography and in the management of patients in the days after lymphography.

84. EFFECT OF ORAL CONTRACEPTIVE AGENTS ON THE CHRISTIANSEN, DOUGLAS AND HALDANE EFFECT

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In 1914 Christiansen, Douglas & Haldane demonstrated that oxygenation of whole blood at constant PCO2 leads to a reduction in the CO2-carrying capacity of the blood and suggested this was because oxyhaemoglobin is a stronger acid than reduced haemoglobin. In 1933 Margaria & Green demonstrated that CO2 forms carbamates with haemoglobin which are reduced on oxygenation, and together these two phenomena account for the Christiansen–Douglas–Haldane (CDH) effect of oxylabile CO2 transport.

We have expressed the CDH effect in whole blood as the change in whole-blood CO2 content at Pco2 5-3 kPa (40 mmHg) when the oxygen saturation (SO2) changes from 50% to 100%, using tonometry in vitro to construct whole-blood CO2 dissociation curves. The CDH effect in normal men and normal ovulatory women was constant, but varied through the menstrual cycle in women taking a low-dose oestrogen combined oral contraceptive (McElderry, Walker & Flenley, 1979, Clinical Science, 56, 99). We now confirm this observation. In the ovulatory women the mean value of the CDH effect for eight estimations in four women was 10-08 ± 2d 1-44 μmol of CO2/g of haemoglobin (Hb) at mid-cycle and 10-64 ± 2-43 μmol of CO2/g of Hb at menstruation. However, in eight women taking the oral contraceptive agent the mean value of the CDH effect for 18 estimations was 10-18 ± 1-13 μmol of CO2/g of Hb at mid-cycle but fell to 6-54 ± 0-99 μmol of CO2/g of Hb at menstruation, and this change was significant (P < 0.001).

In two women starting to take an oral contraceptive agent for the first time there was a reduction in the CDH effect at the end of the second month in both subjects, but in one subject the effect did not appear during the first month.

We have not so far found the mechanism of this effect on oxylabile CO2 transport: there is no change in the acid–base status, in methaemoglobin or glycosylated haemoglobin concentrations, or in the concentrations of reduced glutathione in the erythrocyte during the cycle in those women taking the contraceptive agent in whom the change in CDH effect is present.

85. EFFECTS OF VARYING GAS VISCOSITY AND DENSITY ON PULMONARY MECHANICS

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Many recent studies investigating the site of airways obstruction have examined the effects of breathing helium + oxygen (80:20) (He/O2) on maximum forced expiratory flow. He/O2 has a density one-third that of air but a similar viscosity, and contrast which is not retained in the lymph nodes may obstruct the venous capillary blood supply to the lungs with reduction in respiratory function. This investigation was to assess the timing and degree of adverse respiratory effects after lymphography in patients with malignant lymphomas without overt evidence of parenchymal lung disease. Eleven patients were initially studied; respiratory function was checked before and 24 h after lymphography. A significant fall in transfer factor was confirmed in the group as a whole. Other respiratory function tests were not significantly affected. Further patients were studied sequentially before and 4, 8, 24, 48, 72, 96 and 120 h after lymphography. Falls in transfer factor occurred within hours of lymphography and persisted for several days.

These changes may have implications in the selection of patients for lymphography and in the management of patients in the days after lymphography.

86. INCREASED REFLEX HYPOXIC DRIVE TO BREATHING IN HEAD-INJURY HYPERVENTILATION: EVIDENCE FOR A CORTICAL RELEASE MECHANISM?

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The mechanism of head-injury hyperventilation is unknown. We have measured breath by breath values for instantaneous minute ventilation (V, INST) in seven unconscious head-injured adults