and signs. Haematological values and liver enzyme values had reverted to normal, but the bilirubin level remained raised at $22 \mu\text{mol/l}$ (1.3 mg/100 ml).

Discussion

CMV infection either causes a focal process limited to salivary glands or intestinal or respiratory tract or presents as generalised cytomegalic inclusion disease. Although CMV antibodies are often acquired during adult life, the generalised form is very seldom recognised in adults except as a complication of debilitating diseases, cytotoxic drugs, or blood transfusion. It may, however, present as a Paul-Bunnell negative form of glandular fever. The clinical course is usually that of a benign pyrexial illness lasting two to six weeks and associated with peripheral blood mononucleosis and abnormal liver function test results without significant lymphadenopathy or exudative pharyngitis.³ Although rare, the fundal appearance in adult CMV chorioretinitis may be distinctive, as in this patient. The lesions progress through the healing stage punctate chorioretinal scarring, and the condition may take a fulminating course if the patient is receiving systemic steroids.¹ The other ocular changes that she developed have been described previously on rare occasions.⁴

This report describes the first previously healthy adult to be afflicted with CMV chorioretinitis. She probably developed her severe illness because, as a hospital-based teacher, she was often in close contact with chronically sick children, from whom CMV can be readily isolated.⁵ The possibility of CMV infection should always be considered in previously healthy adults presenting with a pyrexial illness who had been exposed to similar risk.

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Continuous monitoring of mixed venous oxygen tension

An umbilical artery catheter carrying an oxygen electrode mounted at its tip¹ has enabled continuous monitoring of the arterial oxygen tension in infants with respiratory distress syndrome.² This electrode when inserted into the adult radial artery is also of value in managing patients undergoing one-lung ventilation.³ We report here our initial experiences in flow guiding this catheter and its oxygen electrode into the pulmonary artery, thereby permitting continuous monitoring of mixed venous oxygen (MVO_2) tension and pulmonary artery pressures.

Apparatus, method, and results

The catheter is 5 F diameter, 100 cm long, and made of polyvinyl chloride with a polystyrene-coated tip. It is of double lumen construction, one lumen containing the wires to the miniaturised Clark polarographic electrode at its tip, the other being patent, allowing blood sampling and pressure monitoring. Placement of the oxygen electrode was studied in 10 patients who had severe cardiorespiratory disorders. The sampling lumen of the catheter was filled with heparinised saline. Using a sterile technique it was inserted percutaneously through a 14-gauge needle into a basilic or

internal jugular vein and then advanced into the pulmonary artery. Catheter tip pressure was monitored with an Elcomatic transducer, oscilloscope, and writer. The electrocardiogram was monitored throughout and a chest x-ray picture was taken to confirm correct positioning of the catheter tip. While in situ the catheter was continuously flushed with heparinised saline using a Flotrol device.

In all patients the catheter recorded a satisfactory series of pressure traces so that there was no doubt about the position of the catheter tip. Placement into the pulmonary artery was achieved in nine patients within one minute of its arrival in the right atrium and in one patient after five minutes. Occasional isolated ventricular ectopics were seen during the passage of the catheter through the right ventricle. In one patient the catheter dropped

Pressure traces obtained in patient with oxygen electrode catheter and Swan Ganz flow directed catheter, recorded serially and using same signal amplification.

back in to the right ventricle when she was turned into the lateral position and in two other patients the same thing happened spontaneously after three and 12 hours. In the remaining seven patients the catheter remained in the pulmonary artery until removed after 12-24 hours. The figure shows the pressure traces obtained with the oxygen electrode catheter and a 5 F Swan Ganz catheter recorded serially in the same patient using identical signal amplification. The oxygen electrode was calibrated by conventional blood gas analysis of blood samples obtained via the catheter using an Instrumentation Laboratories 313 blood gas analyser. Stable recordings were always achieved within 30 minutes of insertion. Accuracy of the electrode and lack of drift were confirmed by repeat sample blood gas analysis.

Discussion

Oxyhaemoglobin saturation depends on the shape of the oxyhaemoglobin dissociation curve and the haemoglobin affinity for oxygen, the latter varying with pH, Paco_2 , temperature, and 2-3 diphosphoglyceric acid level. Several investigators¹⁻⁵ have confirmed the value of MVO_2 saturation and tension as indices of deteriorating cardiac output and tissue oxygenation. With the aid of this commercially available oxygen electrode the MVO_2 tension can be continuously monitored.

Interpreting the MVO_2 tension can be difficult. For instance, a fall in MVO_2 tension in a patient with Gram-negative septicaemia would indicate a deterioration of respiratory function or cardiac output or an improvement in tissue oxygen uptake. A clinical evaluation of this catheter is now in progress.

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