

References

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Cerebral perfusion in the dog

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Cross circulation experiments have proved useful in studying drugs which produce cardiovascular changes by an action on the CNS. The method of Taylor & Page (1951) involves the perfusion of the cerebral vasculature of one dog by the circulation of another and in the method of Barrett, Ingenito & Procita (1969) the cerebral vasculature of the cat is perfused by oxygenated, mechanically pumped blood. A modification of the method of Barrett *et al.* (1969) for cerebral perfusion in the dog is described here.

Anaesthesia was induced in beagle dogs (10-16 kg) using thiopentone sodium (25 mg/kg i.v.) and maintained with chloralose (100 mg/kg i.v.). Blood pressure was recorded from a femoral artery and the heart rate obtained from the blood pressure pulse. The carotid and vertebral arteries and the external jugular veins were located. The thyroid and internal jugular veins and all branches of the external jugular veins caudal to the point of cannulation were ligated. 200 units/kg heparin was administered intravenously.

A Bentley 'Temptrol' infant-sized blood oxygenator (Q-130) and a 'Sarns' pump (Model 3500), primed with 500 ml of heparinised (100 units/ml) dog blood, were used to perfuse the head of the animal. Blood was pumped to the head via both common carotid arteries and venous drainage was taken from the external jugular veins. The vertebral arteries were then ligated. Perfusion was carried out at a flow rate of approx. 100 ml/min at a mean perfusion pressure

of 100 mmHg. Injections were made via a carotid artery into the cerebral circulation and the effects on systemic blood pressure, heart rate and central perfusion pressure were observed.

Although the vertebral venous sinuses were not ligated, leakage into the systemic circulation was found to be low. This corresponded to approximately 5%/min of a centrally injected dose of Evans Blue dye (assayed spectrophotometrically at 600 nm using a 'Cecil' CE 272 spectrophotometer). Thus cardiovascular responses to catecholamines injected into the cerebral circulation could be obtained which were not subject to interference by effects on the systemic circulation. Similarly, intravenous injection of catecholamines produced only reflex changes in cerebral perfusion pressure.

If the responses to drugs with a longer duration of action are to be investigated, the vertebral venous sinuses may be ligated using the method of Taylor & Page (1951). However, this procedure involves extensive surgery and reduces the life of the preparation to 2-3 h compared with 3-5 h if the sinuses are left intact.

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