HALOTHANE ANAESTHESIA IN TURKEYS

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SUMMARY

An anaesthetic technique employing halothane in oxygen for use in adult turkeys is described. The mixture was administered using a Magill attachment and a Hall cat mask. Induction was rapid and excitement-free. Anaesthesia was maintained for varying periods of time up to a maximum of 80 minutes. Recovery was rapid. In a total of twenty-five turkeys no deaths occurred which were attributable to the anaesthetic.

Since 1957 a number of publications describing the satisfactory use of halothane in a variety of species including man have appeared. The use of the drug for anaesthesia in experimental animals including rats, mice, cats and monkeys was described by Raventós in 1956 and the use of the drug in the clinical anaesthesia of cats, dogs, pigs, horses and cattle was reported by Hall in 1957.

In avian species use of halothane as a suitable general anaesthetic agent for budgerigars and other small birds has been described by Graham-Jones (1960) and the satisfactory induction and maintenance of anaesthesia in young and adult chickens was reported by Marley and Payne (1962a, b; 1964). A number of authorities consider the use of volatile agents unsatisfactory for anaesthesia in poultry due to the complex structure of the respiratory system. It is suggested that a dangerously high concentration of volatile anaesthetic agent may build up in the air sacs and will be removed slowly or cause death by overdose, but in a review of the literature and a reappraisal of the common methods of anaesthetizing chickens, Jordan, Sanford and Wright (1960) were able to show that satisfactory anaesthesia could be produced by ether in air. This article describes anaesthesia of the turkey by means of halothane. Anaesthesia was necessary in order to investigate the effect of altering the blood supply to the liver by ligating either the coccymesenteric vein or the posterior vena cava.

ANAESTHETIC METHOD

Premedication of the turkeys was not found to be necessary nor were the birds starved of food and water prior to anaesthesia and surgery. Halothane was administered from a Fluotec (Cyprane Ltd.) vaporizer which was calibrated to deliver up to 10 per cent halothane in the carrier gas (oxygen). The vaporizer was fitted to a standard Boyle anaesthetic machine (British Oxygen Co. Ltd.) which will deliver up to 5 l./min of oxygen. The anaesthetic agent was delivered to the birds through a semiclosed circuit using a Magill system. The system was connected to a Hall cat mask (British Oxygen Co. Ltd.) which was lightly applied to the bird's face. The amount of head visible was related to the size of the bird although it was always possible to place the beak and nostrils inside the mask.

Induction of anaesthesia was carried out by placing the facepiece on the bird, which was restrained by an assistant, after the oxygen-halothane mixture had been turned on for at least 2 minutes to produce a uniform concentration in the circuit. In order to restrain the birds for induction of anaesthesia they were held under the left arm and the head was held with the right hand. The birds did not resist the application of the facepiece nor inhalation of the halothane vapour. A concentration of 2–4 per cent was used for induction of anaesthesia which was usually complete within 4–5 minutes. Flow rates of 1–2 l./min of oxygen were used. No excite-
ment was noted on induction of anaesthesia.

The birds were considered to be at the stage of surgical anaesthesia when they did not react to vigorous pinching of the skin in the cloacal region or to the pinching of the comb or wattles. The corneal reflex with movement of the membrane nictitans persisted throughout the course or anaesthesia. Anaesthesia was maintained with concentrations of 2–2½ per cent halothane in oxygen although variations in respiratory rate were used as a guide to the depth of anaesthesia. If the respiratory rate increased, the concentration of halothane being supplied was increased and occasionally it was found necessary to administer up to 8 per cent halothane in order to reduce the respiratory rate and abolish occasional movements. If apnoea developed, as it did on a few occasions the halothane vaporizer was turned off and the oxygen flow rate increased to 4–5 l./min. Artificial ventilation was carried out by keeping the facepiece tightly applied to the head and rhythmically compressing the reservoir bag. Effective gaseous exchange could be produced by this method, and after a few compressions of the bag spontaneous respiration soon recommenced.

Throughout the course of anaesthesia of this series of birds it was never found necessary to perform endotracheal intubation. A build-up of pressure within the circuit was prevented by keeping the expiratory valve permanently open. The inhaled gas mixtures were never humidified and even after periods of anaesthesia up to 80 minutes no postanaesthetic complications were noted.

Recovery from anaesthesia was uneventful; within 5–20 minutes of withdrawing the anaesthetic agent consciousness was regained and the birds were able to resume the sitting position. The majority of birds were able to walk within 30 minutes although most of the birds were returned to their individual pens and allowed undisturbed recovery. On discontinuing the halothane, administration of oxygen was continued until the birds showed some movement which indicated recovery. No postoperative excitement was noticed.

RESULTS

The results of the experiments are summarized in table I. A total of 27 birds were anaesthetized during this series of experiments. No deaths occurred which could be attributed to the anaesthetic technique. One animal died of haemorrhage due to accidental puncture of the posterior vena cava and another was deliberately sacrificed due to the presence of adhesions which would have made successful surgery difficult. Of these birds, 6 were females and 21 males. Nineteen of the birds were subjected to ligation of the posterior vena cava and 8 had ligation of the coccygeo-mesenteric vein. The birds varied in weight from 2.6 to 9.0 kg and the duration of anaesthesia from 20 to 80 minutes.

DISCUSSION

The results of this series of experiments indicated that halothane-oxygen mixture is a suitable anaesthetic agent for use in abdominal surgery in turkeys of up to 80 minutes duration. The rapid and excitement-free induction has much to
commend it. Halothane is neither irritant, nor explosive, nor inflammable which is important if thermocautery is to be used during surgery. Halothane when used as an anaesthetic agent with oxygen can produce respiratory arrest, although there does appear to be a wide safety margin, in that following a period of controlled ventilation spontaneous respiration could easily be re-established. It would appear that this work substantiates the claim made by Marley and Payne (1962a, b; 1964) that volatile anaesthetic agents can be safely administered to poultry. This is a contradiction of the view expressed by Biester and Schwarte (1952) who suggest that the anatomy of the avian respiratory system renders the use of inhalation anaesthetic techniques rather unsatisfactory for birds. These authors suggest that excessive amounts of anaesthetic agent may be absorbed, resulting in respiratory failure, cardiac inhibition and death.

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REFERENCES