The recurrence rate of puerperal mental illness in subsequent pregnancies in this series was 1 in 5 (18.7%). Relapse was not more frequent when the next birth occurred within two years of the illness.

Therapeutic abortion is discussed.

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ACUTE LARYNGOTRACHEOBRONCHITIS TREATED WITH 0.125% SUPERINONE

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0.125% superinone is a surface-active agent which acts by lowering surface tension, causing liquefaction of thick mucoid and purulent exudations in the upper respiratory tract and bronchial tree. Thickening of the sputum and dryness of the respiratory membranes are minimized, permitting better ciliary action and thus facilitating expectoration. Superinone is made up in a sterile alkaline medium ("alevaire"), which is administered as an inhalation in the form of a fine mist produced by a nebulizer usually activated by oxygen. It may be given intermittently or continuously (see illustration).

Acute laryngotracheobronchitis is usually of sudden onset and often follows a mild upper respiratory infection. It may be rapidly fatal, death being due either to asphyxia caused by laryngeal obstruction with thick viscid mucus or to toxæmia. The infection is probably of virus origin (Rabe, 1948). Cytopathogenic agents have been isolated from the secretion of several patients (Beale *et al.*, 1957), and in a recent paper Beale *et al.* (1958) demonstrated that the presence of these bodies in cases of acute laryngotracheobronchitis is associated with a rise in antibodies during convalescence. Clinically the appearances are reminiscent of laryngeal diphtheria (Garson, 1950), and before the name laryngotracheobronchitis was coined many cases were thought

to be due to this cause, though this diagnosis was never confirmed at post-mortem examinations.

The advent of chloramphenicol was of great value in dealing with the infection and toxæmia (Moncrieff and Weller, 1949), thus reducing the mortality; but the treatment of the asphyxia proved more difficult. Mild cases may be treated by steam inhalation if there is no evidence of bronchopneumonia, but as the patients are anoxic oxygen must be given as well. These patients

Apparatus for administering alevaire in a fine mist.

were therefore nursed in an oxygen tent, being transferred to a steam tent for 10 minutes every hour. Pharyngeal suction was carried out every 15–20 minutes. For cases with asphyxia bronchoscopic suction seemed rational, but this was not always possible and the manipulations involved could easily prove fatal. Tracheotomy then was the only means of trying to prevent death from asphyxia, but, although this successfully bypassed the obstructed larynx, one still had to deal with the viscid exudate in the trachea and bronchial tree. It was felt, therefore, that 0.125% superinone might be of use in dealing with this exudate, and the following is a report of five cases so treated.

Case Reports

Case 1.—A female infant aged 6 weeks was admitted to hospital on February 6, 1958, with a 24-hour history of a cough and cold. She had become very pale and short of breath in a few hours. The birth, personal, and family history revealed nothing relevant. On examination she was afebrile, but grey, cyanosed, and distressed, with rapid breathing and some subcostal recession. Air entry was good, with crepitations at the right base. Post-nasal mucus in small quantity was present. Penicillin was prescribed and the infant nursed in an oxygen tent. She became very much worse some 12 hours later, with marked respiratory embarrassment, collapse, and cyanosis. Air entry over the

lungs was then very poor and there was much white viscid mucus in the fauces arising from the larynx. A diagnosis of acute laryngotracheobronchitis was made. It was decided to give alevaire by facemask for 10 minutes every two hours, followed by pharyngeal suction. Penicillin was discontinued and chloramphenicol 125 mg. six-hourly substituted. After 12 hours there was no dyspnoea or cyanosis, and mucus was much reduced and less viscid. Air entry was then good, with no subcostal recession. The alevaire was finally discontinued after 48 hours and the oxygen tent removed. Chloramphenicol was stopped after five days. On admission the W.B.C. was 16,300. The chest x-ray picture on February 20 was clear. The baby was discharged quite well after 18 days.

Case 2.—A female infant aged 3 months was admitted to hospital on February 11, 1958, with a history of croupy cough for 24 hours. She became worse suddenly two hours before admission, with marked dyspnoea and cyanosis. The birth, personal, and family history revealed nothing relevant. On examination she was afebrile, collapsed, and limp, with moderate generalized cyanosis, much dyspnoea, and moderate subcostal recession. Faucial examination revealed much viscid white mucus arising from the larynx. Air entry was poor and few crepitations were heard. There were no other significant signs. Acute laryngotracheobronchitis was diagnosed and she was admitted to hospital at once. The infant was nursed in an oxygen tent and was given alevaire by facemask for 10 minutes every 90 minutes, followed by pharyngeal suction and chloramphenicol 125 mg. six-hourly. After 12 hours there was no dyspnoea or cyanosis, and the fauces were clear; the air entry over the lungs was good, with no subcostal recession. Her general condition was very good. Alevaire and the oxygen tent were discontinued after 48 hours and chloramphenicol after five days. The W.B.C. on admission was 8,400. The chest x-ray picture on February 19 was clear. The infant was discharged after 19 days in excellent general condition.

Case 3.—A male infant aged 3 weeks was admitted to hospital on February 17, 1958, with a three-day history of cough and 12-hour history of cough with vomiting and cyanosis. Birth, personal, and family history showed nothing relevant. On examination he was afebrile and slightly cyanosed, with rapid respiration and marked subcostal recession. Air entry over the lungs was poor, and there was inspiratory stridor. A moderate amount of white viscid mucus was present in the throat. The infant was nursed in an oxygen tent and was given alevaire by facemask for five minutes every two hours, followed by pharyngeal suction and chloramphenicol 125 mg. six-hourly. The patient showed marked improvement in about eight hours. There was no dyspnoea or cyanosis, the fauces were clear, and air entry was good. The oxygen was discontinued after 24 hours, but chloramphenicol was continued for five days, by which time all abnormal signs had cleared. The W.B.C. on admission was 7,600. The baby was discharged after 11 days.

Case 4.—A male infant aged 4½ months was admitted to hospital on March 1, 1958, with a history of cough and snuffles for two weeks and pallor and cyanotic attacks for two days. A dyspnoeic attack occurred before admission. Birth, personal, and family history revealed nothing relevant. On admission the child was febrile, with only slight cyanosis and normal respiration, and did not appear to be seriously ill. Air entry over the lungs was good, with a few crepitations at the left base. A short time after admission, however, he became very distressed, pale, cyanosed, and limp. On examination there was very poor air entry with marked respiratory embarrassment. Faucial examination revealed a large quantity of viscid white mucus. Treatment consisted of immediate pharyngeal suction. Alevaire was given by facemask five minutes every two hours followed by pharyngeal suction, and chloramphenicol 125 mg. six-hourly was prescribed. There was marked improvement after about 12 hours: no dyspnoea or cyanosis, air entry good, and fauces free of exudate. The alevaire was discontinued after 36 hours, but the oxygen tent was needed for three days.

Chloramphenicol was stopped after five days. Progress was complicated by a secondary bronchopneumonia, which, however, responded to tetracycline. Chest x-ray films showed a patch of consolidation at the right base which suggested abscess formation, but further films showed that this was resolving satisfactorily. This, of course, has prolonged the baby's stay in hospital. The W.B.C. on admission was 7,300.

Case 5.—A male infant aged 5 weeks was admitted to hospital on March 1, 1958, with a three-day history of cough and cyanotic and dyspnoeic attacks for the previous few hours. Birth, personal, and family history revealed nothing relevant. On examination he was cyanosed and dyspnoeic, with marked subcostal recession. Air entry over the lungs was very poor; there were no added sounds. A moderate amount of viscid white mucus was present in the pharynx. He was nursed in an oxygen tent and given alevaire by facemask for five minutes every two hours followed by pharyngeal suction and chloramphenicol 125 mg. six-hourly. Marked improvement occurred after a few hours: improved air entry, no dyspnoea or cyanosis, and fauces free of exudate. Alevaire was discontinued after 36 hours; oxygen was maintained for three days. Chloramphenicol was discontinued after five days, by which time all abnormal signs had disappeared. The W.B.C. on March 4 was 17,800. Chest x-ray examination on March 12 showed clear lung fields with some interlobar pleural thickening on the right side. He was discharged quite well after three weeks.

Comment

Cases 1, 2, and 4, would have qualified for tracheotomy, but it was decided to try the effect of alevaire before actually resorting to this. Previous attempts at diffusing alevaire into the oxygen tent continuously had not been successful, so it was thought advisable to administer it in Case 1 by means of a facemask placed directly over the patient's nose and mouth. The resulting liquefaction of the thick viscid mucus after only a few minutes, with rapid improvement of the asphyxia and cyanosis, was quite impressive, and so this method of administering alevaire intermittently was continued. Although the laryngotracheal secretion ceased to form after 8 to 12 hours, the intermittent administration of alevaire was continued for a longer period as described in the case reports.

Summary

Five cases of acute laryngotracheobronchitis are reported in which the asphyxial aspect was successfully treated with alevaire. Three of these (Cases 1, 2, and 4) would have needed tracheotomy otherwise. The alevaire resulted in rapid liquefaction of the viscid laryngeal exudate, with immediate improvement of the dyspnoea and cyanosis. All the patients recovered.

We thank the sisters and nursing staff for the excellent nursing management of these cases.

ADDENDUM.—Since the above was written Case 4 developed a recurrence of bronchopneumonia during his convalescence. His stools were then noticed to be frequent and very offensive. Examination of the stools showed no tryptic activity. No tryptic activity was detected in the duodenal juice, and his sweat test showed an increase in the chlorides to 840 mg./100 ml. There seemed no doubt, therefore, that he was suffering from mucoviscidosis. His condition continued to deteriorate, with increase in the physical signs over the lungs and reticular shadows in the chest x-ray films. Death occurred on April 25, 1958. Post-mortem examination revealed purulent bronchopneumonia and a tough fibrotic pancreas.

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