

any defect such as esophageal atresia or tracheal fistula, and use of the rectal thermometer may also serve to indicate whether the anorectal area is normal.

And lastly we should remember that the preservation of these babies does not depend nearly so much on our having the latest and newest gadgets as it does on the quality of nursing care and the soundness of our observations and medical judgments.

■ **SUMMARY.** In the care of the pregnant patient with diabetes, the paramount objective is the delivery of a healthy baby to a healthy mother. The obstetrician must work closely with the internist and the pediatrician. The medical care of the mother is concerned chiefly with prevention of acidosis and the careful regulation of insulin dosage. Injectable insulin is the agent of choice; if the long-acting form is used,

Manipulation and Postoperative Pulmonary Complications

RAYMOND E. HENSHAW, D.O., GREELEY, COLO.

Pulmonary problems are among the most frequent causes of morbidity following surgical procedures. Kurzweg¹ states that the incidence of postoperative complications averages 2.5 to 3 per cent of all operations, 20 to 30 per cent in upper abdominal operations, and 10 to 20 per cent in all types of abdominal surgery. Clendon and Pygott,² reviewing case records on 300 consecutive patients in 1944, found 38 per cent of the group having abdominal operations and 2.7 per cent of the group having nonabdominal operations to show evidence of respiratory complications.

Moersch³ found atelectasis in 4 per cent of patients having lower abdominal operations and in 10 per cent of patients having upper abdominal operations. A Mayo Clinic report⁴ on surgery of the

This paper was prepared during Dr. Henshaw's residency in the Department of Surgery, College Hospital, College of Osteopathic Medicine and Surgery, Des Moines, under the direction of Ronald K. Woods, D.O., chairman of the Department. Dr. Henshaw was the recipient of a 1962 grant in graduate education from Merck, Sharp, and Dohme.

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a short-acting form should be introduced just before the baby is to be delivered, to insure control. It is suggested that the blood-sugar level be maintained at about 140, if possible. Sodium intake should be restricted to about 1 gram per day; diuretic agents should be used as indicated. Administration of stilbestrol and progesterone has been reported to lessen the risk of preeclampsia and fetal death, but the results are questionable, and probably the avoidance of acidosis is more important in this connection. It is highly important that the patient be hospitalized for complete evaluation sometime before the thirty-fifth week of pregnancy. If preterm delivery is decided on, either pitocin-drip induction or cesarean section may be carried out. Although the newborn infant may be oversize, it is nevertheless immature, and should be treated as a premature infant, with special attention to metabolic and anatomic defects.

stomach and duodenum for 1950 stated that 25 per cent of the hospital deaths were due to pneumonia. Glassman and McNealy⁵ state that the incidence of fatal postoperative embolism is approximately one in 1000, or 0.1 per cent; of these, approximately 50 per cent of patients are under 50 years of age. It also can be assumed that many pulmonary complications may go undetected unless they are sought specifically.

The etiologic factors in postoperative pulmonary morbidity are almost innumerable, although the basic problem is one of maintenance of a clear tracheobronchial airway. Postoperative pulmonary edema, atelectasis, pneumonia, and lung abscess usually are secondary to partial or complete obstruction of the tracheobronchial airway by retained or aspirated secretions. Anscombe⁶ has shown that upper abdominal operative procedures will greatly reduce vital capacity and maximum expiratory and inspiratory rates, often as much as 40 per cent. This reduction of vital capacity was found to be directly proportional to the incidence of pulmonary complications. Beecher⁷ and Powers⁸ also have reported similar findings.

Other etiologic factors which may precipitate postoperative pulmonary morbidity are: the preoperative and postoperative use of excessive narcotics and sedatives, indiscriminate use of intravenous fluid therapy before and after operations, and preexisting conditions such as structural defects or diabetes mellitus. Complications also may occur in patients who are excessively heavy smokers.

■ **OSTEOPATHIC LESIONS AS ETIOLOGIC FACTORS.** The purpose of this paper is to focus attention on another probable etiologic factor for postoperative

pulmonary morbidity—that of the osteopathic lesion. The value of routine preoperative and postoperative osteopathic care in prevention of pulmonary complications would seem indicated, should the osteopathic lesion prove an etiologic factor of any relative importance.

The respiratory center is located in the reticular substance in the lower part of the medulla and forms the floor of the fourth ventricle. Cecil and Loeb⁹ state that "It appears probable that essential rhythmicity of respiratory activity is inherent in all of the reticular substance." The visceromotor, viscerosensory, and viscerotrophic reflexes which arise from stimuli originating in the lungs appear to manifest themselves in tissues supplied by nerves arising in most of the cervical segments, but to be more marked in those tissues supplied by neurons arising in the third to fifth cervical segments. Pottenger¹⁰ has stated that the visceromotor reflex, which is caused by inflammation in the lung, shows itself in the contraction of the fibers of those muscles which receive their origin from the cervical portion of the cord, and particularly from the third to fifth cervical segments. This is recognized clinically as an increased tone or spasm of the tissues involved.

There are also numerous chemical regulators of respiration. Gaensler¹¹ has stated that of the chemical regulators of respiration, the carbon dioxide tension of arterial blood is the dominant stimulus. Blood acidity and anoxia are other stimuli. Anoxia acts chiefly through the carotid sinus mechanism located in the cervical area. Overholt¹² has shown that extreme asthma often can be relieved in patients with no structural abnormality of the pulmonary system by glomectomy.

■ **PRESENT STUDY.** A survey of surgical patients was started in August 1961 and completed in March 1962. The purpose of the study was to determine if a preexisting pattern of one or more lesions was present on those patients who developed postoperative pulmonary complications. If this were so, could the pulmonary complication be prevented by correction of these lesions prior to operation? Also, this study sought to determine if routine use of osteopathic manipulative therapy before and after operations would significantly reduce pulmonary complications.

A total of 1,031 surgical patients were studied. Of this total, 109 (10.6 per cent) had preexisting lesions at the level of the third, fourth, and fifth cervical vertebrae prior to surgery. Of this number, 75 were given corrective manipulative therapy for these lesions. Of this group, 3 patients (5.3 per cent of the patients), developed postoperative pulmonary complications. Of the remaining 34 patients, who were *not* given corrective manipulation for preexisting cervical lesions, 29 (85.3 per cent) developed pulmonary complications.

The total number of patients developing postoperative pulmonary complications was 32 (3.1 per cent) of all cases studied. Of this number, 22 (68.8 per cent) had upper abdominal operations, and 8 (25 per cent) had lower abdominal operations, with all other types of operations making up the remaining percentage.

In all cases early ambulation was used and antibiotic therapy was ordered as indicated.

The pulmonary complications involved, including the number of cases and percentages, were:

TABLE I—TYPES OF COMPLICATIONS

Complications	No. of cases	Per cent of complications
Atelectasis	3	9.4
Emphysema	4	12.5
Pleural effusion	1	3.1
Pulmonary edema	2	6.3
Pneumonia	5	15.6
Bronchitis	6	18.8
Cough	11	34.4

It can be seen from the above findings that there appears to be a more than casual correlation between postoperative pulmonary morbidity and the presence of osteopathic lesions in the cervical area, with particular attention being drawn to the third to fifth cervical segments. It would also seem that correction of these lesions prior to surgery produced a significant decrease in the postoperative pulmonary morbidity.

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