TABLE I—Mean Changes in Dynamic Lung Volumes and Arterial Blood Gas Tensions in Six Patients with Chronic Obstructive Bronchitis

<table>
<thead>
<tr>
<th>Time in Minutes</th>
<th>Basal</th>
<th>30</th>
<th>60</th>
<th>90</th>
<th>120</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEV₁</td>
<td>0.63</td>
<td>0.60</td>
<td>0.60</td>
<td>0.59</td>
<td>0.60</td>
</tr>
<tr>
<td>FVC</td>
<td>1.78</td>
<td>1.63</td>
<td>1.79</td>
<td>1.76</td>
<td>1.66</td>
</tr>
<tr>
<td>FEV₁/FVC</td>
<td>32.9</td>
<td>33.5</td>
<td>33.6</td>
<td>34.1</td>
<td>32.4</td>
</tr>
<tr>
<td>Pao₂</td>
<td>49.3</td>
<td>47.7</td>
<td>48.9</td>
<td>46.4</td>
<td>47.3</td>
</tr>
<tr>
<td>Paco₂</td>
<td>58.7</td>
<td>59.7</td>
<td>60.0</td>
<td>59.8</td>
<td>60.0</td>
</tr>
<tr>
<td>pH</td>
<td>7.41</td>
<td>7.39</td>
<td>7.41</td>
<td>7.40</td>
<td>7.41</td>
</tr>
</tbody>
</table>

A = Nitrazepam 10 mg. P = Placebo.
*Difference between A and P significant at 1% level.

The sixth patient was studied for four hours because it was noted that the fifth patient appeared to become increasingly confused between two and four hours on the active drug. In the sixth patient, while on the active drug, the Pao₂ fell by 13-0 mm Hg from 48 to 35 mm Hg while the Paco₂ tension rose by 8-5 mm Hg from 59-5 to 68-0 mm Hg. It was thought unethical to continue the trial.

Discussion

Ventilatory capacity fell quite appreciably at 120 minutes after the ingestion of 10 mg of nitrazepam in these patients with severe chronic obstructive bronchitis and hypercapnia. There was a tendency for the arterial oxygen tension to fall and the hypercapnia to increase. These changes in blood gas tensions seemed to develop later than the changes in the spirometric measurements.

Intravenous diazepam has been shown to reduce the ventilatory capacity in an uncontrolled study of patients with obstructive lung disease, leading to a mean increase in arterial carbon dioxide tension of 3-5 mm Hg (Catchlove and Kafer, 1971). Although it is impossible in the present study to separate the sedative and muscle relaxant properties of nitrazepam, the fall in ventilatory capacity is pronounced. In our sixth patient, who was studied for four hours, there were major changes in blood gas analysis. The other five patients were studied for only two hours because nitrazepam is expected to induce sleep within 45 minutes (Rutishauser, 1965).

It is well known that sedatives such as barbiturates are contraindicated in patients with ventilatory failure. There is a tendency to regard nitrazepam as a "safe hypnotic" (Matthew et al., 1969). Nitrazepam is prescribed in clinical practice for patients with severe respiratory disease, and indeed three of our patients had received it before admission, though an association with a deterioration in respiratory function has been suggested (Clark et al., 1971). The present study indicates that nitrazepam is contraindicated in patients with severe chronic obstructive bronchitis. Probably no sedative or tranquilizing drug is completely safe in these patients.

Our thanks are due to Dr. A. F. MacDonald for performing the arterial cannulations, to Dr. Gordon Hems for statistical advice, and to Mr. Keith Minty for technical assistance.

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References


Preliminary Communications

Nephrostonomography in Infants and Children: A New Technique


British Medical Journal, 1972, 2, 689-691

Summary

A technique has been developed for the ultrasonic investigation of renal disease in infants using a specially designed water-bath with a conventional ultrasonic scanner. This permits ultrasonic studies of the renal tract from the neonatal period onwards; the procedure does not distress the child and the water acts as an excellent coupling medium.

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Introduction

Investigation of the urinary tract of the young child is generally confined to procedures which depend on the presence of some degree of renal function. In a number of conditions such as hydrenephrosis and cystic disease little or no function may be present in a child, and it may be difficult to assess the degree of dilatation and the extent of parenchymal damage by intravenous urography. Successful retrograde pyelography and nephrotomography may supply some additional information but are rarely used in the infant as the former is a difficult and hazardous operative procedure and the latter incurs a relatively large dose of radiation.

Holmes (1966) and Barnett and Morley (1971) showed ultrasound to be a safe, non-surgical technique in the investigation of the urinary tract in adults. They reported its usefulness in differentiating between renal cysts and tumours, in assessing hydrenephrosis, and in visualizing bladder tumours. Hüning and Ameri (1970) illustrated some uses of ultrasound in children with contact B scanning. Although this is the most widely accepted method of obtaining information by ultrasound it was found by us to be unsuitable for examining most infants aged less than 2 years even when under sedation and asleep. However gently applied, the rocking motion of the transducer across the patient's back was irritating and caused the child to squirm. In order to overcome this difficulty a water-bath has been specifically designed for infants from birth onwards to provide the maximal exposure with a minimum of patient...
discomfort. This report deals with the design of this bath and outlines its advantages over contact scanning in this age group.

Method

The undressed child is placed prone on the examination trolley in a warm room and covered with a towel which is removed when he falls asleep. Some babies who had been bottle-fed immediately beforehand fell asleep during the procedure. Patients requiring sedation were given triclofos syrup (0-5 ml/kg bodyweight), the use of which is safe in advanced renal disease as it is excreted by the liver. Warm olive oil is spread over the child’s back and the specially designed water-bath is applied (Fig. 1). The base consists of two wooden boards resting on the bottom rail of a trolley and held together by a single metal bar under the couch. On each board are two vertically-aligned tubes with holes drilled at 13-mm intervals throughout their length. The supporting bars of the water-bath rest inside these tubes on a metal plate. The height of the bath may be adjusted as required by repositioning these pins either symmetrically or asymmetrically. It may be desirable to raise the cephalad portion of the bath so as not to exert unnecessary pressure on the thorax. A polyethylene sheet secured in a metal frame is filled with warm water (about 37°C) and fitted on to sliding bars which are fixed to the supporting frame. This bath may be positioned along the long axis of the trolley or placed transversely by the use of an accessory metal frame, as shown in Fig. 1.

The bath is 30 cm long, 15-5 cm wide, and 8 cm deep. It contains about 2,500 ml of water. An area 16 by 9 cm can be brought into contact with the infant’s back, allowing ample room to examine one kidney longitudinally or both kidneys transversely without disturbing the patient. The even pressure of the warm bath keeps the child comfortable and still. Gentle lateral or longitudinal movements of the whole bath do not rouse the child, and this allows the operator to examine both renal areas thoroughly. If examination of the bladder is indicated this is done with the patient in the supine position, but when the bladder is grossly enlarged it may be visualized with the child prone. The total time of the examination varies, but tends to take 30-45 minutes. This is slightly longer than the time required for the contact scanning method used for older children and adults.

The ultrasonic scanner used is the Diasonograph NE 4101 produced by Nuclear Enterprises. This has a fixed pulse repetition frequency of 300/s and is fitted with an accessory Hewlett-Packard variable persistence storage oscilloscope. A Polaroid photograph permanently records the image. The 2.5-MHz transducer was most frequently used, but in very young patients the 5-MHz transducer gave slightly better definition with adequate penetration.

Illustrative Case

A febrile male aged 11 months was admitted to hospital in August 1971 with a seven-day history of anorexia and general malaise. *Pseudomonas aeruginosa* (10⁵/ml) was isolated from his urine and he was given appropriate therapy. Routine intravenous urography showed a hydronephrotic left kidney with what appeared to be a large, single calculus in the pelvis and no right renal function. A renal scan by ultrasound (Fig. 2) showed a huge distended bladder and the presence of two grossly hydronephrotic kidneys—

**FIG. 1**—Assembly for ultrasonography of infants. Water-bath assembly is aligned transversely over the renal area. 1, Wooden boards. 2, Vertical tube. 3, Supporting bars. 4, Bag of water. 5, Sliding bar. 6, Accessory metal frame.
MEDICAL MEMORANDA

Factitious Anaemia

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British Medical Journal, 1972, 2, 691-692

Iron-deficiency anaemia in adults is usually secondary to blood loss. In many cases the cause and site of blood loss are not established even after full clinical examination and investigation. Iron administration generally improves the anaemia.

In this paper we describe the investigation of two patients referred from abroad for assessment of persistent anaemia. The patients were seen in a six-month period, and the conclusions reached were that in each case the anaemia was a result of massive self-induced bleeding.

Case 1

In July 1970 a 26-year-old Italian woman was referred for investigation of persistent severe anaemia. In 1961, after a fall, her left knee became swollen and painful. Twenty-four hours later blood was aspirated from the knee joint, which subsequently became infected. There followed a continuous serosanguineous discharge for the next four years. In 1965, after a biopsy report of malignant change in the synovial lining, a mid-thigh amputation was performed. The stump became infected and discharged pus for two years. It finally healed in 1968. She then sustained an injury to the right knee. The knee was aspirated and subsequently became infected, discharging pus for the next 18 months. At that time there was noted to be severely anaemic, and during the next two years numerous inconclusive investigations were undertaken in an attempt to clarify the cause of the persistent anaemia. She was treated with various haematinics and regular blood transfusions.

Her family and social history contained nothing relevant.

On admission she was very pale but well nourished. Multiple healed sinuses were present over the anterior surface of the right knee and left stump, and movement of the knee was restricted to 15 degrees of flexion. Nothing further was noted on clinical examination. Initial laboratory results were: haemoglobin 35 g/100 ml, M.C.H.C. 25%, reticulocytes 24%, platelets 327,000/mm³, and W.B.C. 2,800/mm³ (normal differential). On the blood film the red cells were hypochromic and microcytic. The bone marrow was hypercellular with erythroid hyperplasia, and the erythroblasts showed striking dyserythropoietic features. Iron was absent from the bone marrow fragments. Serum iron was 128 μg/100 ml and total iron-binding capacity 300 μg/100 ml (she had received parenteral iron three weeks previously). Serum vitamin B₁₂ and folate levels were normal, as were the blood urea, bilirubin, and liver enzymes. Radiological examination of the alimentary tract showed no abnormalities. Acidified serum lysis and direct antiglobulin tests were negative. Red cell survival studies were carried out with an isotransfusion of ⁵¹Cr-labelled cells (⁵¹Cr half-life was seven days). Excess ⁵¹Cr loss in the stool and urine was not found.

During the first few days in hospital she ran an intermittent pyrexia, for which at first no cause was found. The early results