Subject	Age (yrs.)	Height (cm.)	Weight (kg.)	Resting Excretion*	2-hr. Excretion†	Max. Conc.‡
European Subjects						
M.L.T. ..	42	185	72	0.595	3.316	3.110
N.A.B. ..	38	183	88	0.390	4.260	3.430
P.G.P. ..	33	173	62	0.517	3.800	2.940
W.S.S.L. ..	41	176	68	1.148	4.015	2.733
R.A.K. ..	28	183	*80	0.330	3.540	3.060
Mean ..	36	180	74	0.596	3.786	3.055
s.d. ..				0.291	0.334	0.228
African Subjects						
La ..	20	160	56	0.354	2.766	2.840
Sa ..	32	171	63	0.150	1.268	1.350
Go ..	26	174	54	0.240	2.780	1.780
An ..	35	156	57	0.144	2.590	1.630
Wm ..	40	156	53	0.354	2.564	1.800
Pa ..	28	170	56	0.401	2.037	1.886
Ma ..	38	148	44	0.257	2.727	2.400
Os ..	28	178	60	0.358	2.438	2.720
Jo ..	28	150	43	0.239	3.072	1.330
Ge ..	25	167	65	0.212	1.073	0.793
Mean ..	30	163	55	0.271	2.332	1.793
s.d. ..				0.091	0.634	0.611

* Grammes of urea excreted during the hour prior to the administration of urea.

† Grammes of urea excreted during the two hours following the administration of urea.

‡ The maximum concentration of urea achieved during this two-hour period expressed as grammes of urea per 100 ml. of urine.

suggest, on normal standards, a marked degree of renal impairment. More elaborate functional tests (which will be reported in full elsewhere) have, however, failed to show any abnormality in either the glomerular filtration rate or the rate of perfusion of the kidney by plasma water.

The low normal plasma urea concentration of these subjects, which is of the order of 14 mg. per 100 ml. of plasma, has been briefly reported by Phillips and Kenney (1952). This finding, together with the low urea outputs here reported, is of interest in view of the diagnostic significance attached to these values in kwashiorkor (*British Medical Journal*, 1952). It may well be that the low levels of excretion and plasma concentration reported in this condition are, in part at least, physiological and not due to pathological processes.

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Medical Memorandum

Bronchography in Children

Bronchography in children is, in general, not a simple procedure, and numerous attempts have been made to simplify the technique. Puncture of the cricothyroid membrane, intubation and injection of the iodized oil down a catheter introduced into the tube, or direct passage of a catheter into the larynx through the mouth or nose, all have the disadvantage of reducing the lumen of the larynx and interfering with adequate oxygenation.

Temple and Gray (1950) have evolved a very simple technique. They pour 20 ml. of lipiodol over the back of the tongue of the previously anaesthetized child; this method certainly has the advantage of simplicity. In the past 18 months we have obtained very good results by injecting the required amount of oil from a 10-ml. syringe into a Phillips airway placed in the mouth. If the airway is lifted forwards the distal end compresses the base of the tongue and points directly towards the larynx. This is merely an extension of the method whereby the oil is injected into the larynx, over the base of the tongue, from a syringe attached to a curved cannula, except that the airway replaces the cannula.

The technique should meet the following requirements: (1) it should be as simple as possible; (2) it should be as speedy as possible; (3) no inflammable agent should be used in the x-ray room; (4) the cough reflex should be abolished; (5) return of consciousness and the cough reflex should be rapid; and (6) the minimum quantity of lipiodol should be used. Adequate postural drainage of the affected lobes for 10 to 14 days before the examination is first carried out by a trained physiotherapist, either as an out-patient or as an in-patient.

METHOD

The child, having been tested for iodine sensitivity, is premedicated with quinalbarbitone sodium ("seconal") and atropine according to age, and is induced with nitrous oxide and oxygen, a flow of 2 litres per minute of oxygen and 4-6 litres per minute of nitrous oxide being eventually reached. Chloroform is added from the machine until stage 3 plane one (lower half) is reached, when carbon dioxide 1 litre per minute is added for a few breaths. The mask is removed and a Phillips airway inserted and tilted upwards so that its distal end compresses the base of the tongue and thus points towards the larynx. For a child of 5, 5 ml. (or more, according to age) of lipiodol is injected down the airway direct from a 10-ml. syringe. This is enough to fill the bronchial tree of one lung. The oil can be heard entering the larynx, as a gurgling sound is produced during respiration. The mask is reapplied, only nitrous oxide and oxygen being given, and the child is then turned quickly on to the side to be filled. Usually, no further posturing is required, but better filling of the anterior basic branches of the lower lobe can be obtained by sitting the child up and leaning him forward towards the appropriate side. Films are then taken, and while these are being developed the procedure is repeated if the bronchi on the other side are to be outlined. The amount of chloroform is minimal, averaging 1 drachm (3.5 ml.). The child is kept anaesthetized with nitrous oxide and oxygen only, until the films are developed; if these are satisfactory he can be allowed to regain consciousness. Screening can also be performed, but this is not essential.

Immediately after the operation the child is tilted into the head-down position, and each lung is then percussed and drained for about two to three minutes. In this way most of the injected oil is recovered. This is an important part of the technique. The total duration of the procedure is usually in the region of 15 minutes, and by the time the child leaves the x-ray department he is invariably a good colour and the reflexes have returned.

RESULTS

This technique has given very satisfactory results in our hands; any non-inflammable anaesthetic agent may be employed, but our preference for chloroform is determined by its freedom from the spasm associated with thiopentone, and the depth of anaesthesia is greater than that obtained with trichlorethylene.

The children are a good colour on return to the ward, and oxygen is very rarely required post-operatively; they are generally sitting up and taking an interest in their surroundings in one and a half to two hours after the bronchogram. It is of considerable importance that the follow-up radiographs show that the oil has almost completely disappeared from the lung fields in two to three weeks, and this is a great advantage if further bronchograms are required within a short period.

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