now achieved a total of six pregnancies, two ending in early abortion, three resulting in normal delivery at term, and one being undelivered. Each patient showed radiological evidence of an expanded sella with localised erosion of the fossa but no suggestion of suprasellar extension. Pituitary function tests showed no abnormality apart from an impaired response of growth hormone to insulin-induced hypoglycaemia in two cases. One patient, who miscarried during the first trimester on two occasions within four months, has not shown any radiological changes. Two of the three who delivered at term had uneventful pregnancies and confinements. There were no changes in the radiological appearances of the fossa or the visual fields during pregnancy or following delivery. The other patient developed minimal impairment of her visual fields at the 37th week of gestation, but these changes were not progressive and she was delivered normally. Radiological examination of the pituitary fossa at mid-pregnancy and shortly after delivery showed no significant changes from the prepregnancy appearances and the visual fields have returned to normal. In addition, one patient with radiological suspicion of a tumour has had two pregnancies.

We therefore support the view of Dr Bergh and his colleagues that it is reasonable to manage such patients conservatively, keeping them under close supervision during the pregnancy and considering bromocriptine as the first-line treatment should complications arise.

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¹ Thorner, M O, *et al*, *British Medical Journal*, 1975, **4**, 694.

² Franks, S, *et al*, *British Journal of Obstetrics and Gynaecology*, 1977, **84**, 241.

Factors influencing the incidence of neonatal jaundice

SIR,—The paper by Louise Friedman and her colleagues (13 May, p 1235) deals mainly with obstetric factors affecting jaundice. It suffers the handicap of most retrospective studies that not all infants had plasma bilirubin estimations carried out. The arbitrary allocation of a figure of 77 $\mu\text{mol/l}$ (4.5 mg/100 ml) to those not showing clinical jaundice is not acceptable. We have shown in work awaiting publication that despite a high index of suspicion it is possible to miss up to 4% of infants with bilirubin levels of 205 $\mu\text{mol/l}$ (12 mg/100 ml) or more.

The observation that amniotomy showed no effect on the incidence of jaundice while gestational age was the most important factor is not surprising as it is likely that those patients whose labour was induced preterm were balanced numerically by those induced for prolonged pregnancy. This was certainly true in our experience when, if the inductions for prolonged pregnancy were excluded, the remainder of induced infants had a much higher incidence of jaundice, as would be expected.

More importantly, no account is taken of

feeding,¹⁻³ weight gain,³ or drugs given to the mother,⁴ all of which have significant effects on the incidence of jaundice. Indeed, an earlier report from Dr Friedman's hospital¹ showed that while only 2.7% of infants received breast milk only, the ratio of jaundiced to non-jaundiced was over 3:1. Our results have shown that wholly breast-fed infants have double the incidence of jaundice compared with their artificially fed peers. A similar effect was seen as regards weight gain. Their conclusions may not apply to other hospitals, where the wholly breast-feeding rate may approach or exceed 50%, and as jaundice is multifactorial other factors such as oxytocin or epidural analgesia may, and in our experience do, have a rather different effect.

Retrospective studies, however large, and questionnaires on clinical impressions, however widely distributed, are no substitute for prospective work measuring plasma bilirubin levels in all infants included and continuing their observation over the period concerned.

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¹ McConnell, J B, Glasgow, J F T, and McNair, R, *British Medical Journal*, 1973, **3**, 605.

² Eden, O B, Revolta, A D, and Adjei, S K, *British Medical Journal*, 1974, **3**, 573.

³ Sims, D G, and Neligan, G A, *British Journal of Obstetrics and Gynaecology*, 1975, **82**, 863.

⁴ Drew, J H, and Kitchen, W H, *Journal of Pediatrics*, 1976, **89**, 657.

⁵ Campbell, N, Harvey, D, and Norman, A P, *British Medical Journal*, 1975, **2**, 548.

Myelography and lumbar venography

SIR,—The advocacy by Dr A K Clarke and others (29 April, p 1143) of ascending lumbar venography as a replacement for myelography is strictly a minority view. The great majority of radiologists with experience of examining the spinal canal and its contents prefer the more direct and informative method of myelography. The indirect methods of visualising the lumbar subarachnoid space, epidurography and lumbar venography, provide significantly less detail and do not demonstrate the spinal cord or its nerve roots. They are therefore not widely practised for this purpose for, although useful, their information content is indirect.

The technique of lumbar and dorsal myelography has been radically changed in the past five years by the introduction of the low-osmolality water-soluble contrast media—at first meglumine iocarmate (Dimer X) and later metrizamide (Amipaque).

Every new radiological technique and every new contrast medium produces its occasional problems and even disasters. Such a disaster is that reported by Dr J B Eastwood and others (18 March, p 692)—central fracture dislocation of the hips following myelography with iocarmate. Mild muscle spasm occurs in 0.5–2% of patients investigated by iocarmate myelography; the spasms are usually mild and almost always respond to intravenous diazepam if it is given in sufficient dosage, early, and repeated if necessary. Very rarely the spasms become severe, usually when the spinal cord has been bathed for many minutes with the contrast medium, because of too large a dose, a low spinal block, or inadequate post-myelographic posture. Early administration of a sufficient dose of diazepam is a very important factor in preventing severe and damaging muscle spasm, which occurs very rarely with a careful water-soluble myelographic technique

using iocarmate. Dr Eastwood's patient appears to have been one of these very rare cases.

It is very important to realise that metrizamide lumbar myelography does not cause muscle spasm, and no such complication has been reported in the first 100 000 such examinations. Metrizamide is considerably less neurotoxic than iocarmate; it can therefore be used in considerably higher dose (3000 mg iodine compared with an absolute maximum dose of 2000 mg of iodine when using iocarmate). Metrizamide lumbodorsal myelography is a very safe, reliable and informative technique.

The other complication of water-soluble myelography mentioned by Dr Clarke and his colleagues is headache. This occurs in about 25–30% of patients subjected to either iocarmate or metrizamide myelography. It is due mainly to cerebrospinal fluid leak through the puncture hole in the arachnoid as the patient is propped head up after the procedure. It is therefore important to use a lumbar puncture needle no larger than 22 SWG. Headache, nausea, vomiting, and buttock pain occur with approximately equal frequency in oil- and water-soluble myelography.

Metrizamide lumbodorsal myelography is considered by very many experienced radiologists to be the preoperative investigation of choice for the investigation of the lumbosacral syndrome. It is a precision procedure, producing very much better anatomical detail of the lumbosacral nerve roots than any other technique (oil myelography, epidurography, or lumbar venography), with a very low incidence of adverse reactions. Water-soluble myelography is very different from oil myelography and it is essential to follow carefully the details of technique and radiographic interpretation as fully described in the literature.¹⁻³ It is my firm belief that lumbodorsal myelography with metrizamide (or one of the even newer contrast agents now being evaluated) will increasingly become the radiological investigation of choice for disease of the lower spinal cord, its nerve roots, and its meninges, and especially for the lumbosacral syndrome.

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¹ Grainger, R G, *et al*, *British Journal of Radiology*, 1976, **49**, 996.

² Grainger, R G, in *Recent Advances in Radiology*, 6, Edinburgh, Churchill Livingstone, 1978.

³ *Acta Radiologica*, 1978, suppl 355.

Pilots' hearts

SIR,—Your leading article (29 April, p 1089) discusses the difficult question of the detection of coronary artery disease in apparently healthy pilots or in those with atypical chest pain. The limitations of both resting and exercise electrocardiography are stressed, but the role of other non-invasive investigations is not considered. Radioisotope imaging of the myocardium is a technique which has potential value in this setting. Recently it has been shown¹⁻⁷ that gamma-camera images of the myocardium obtained after intravenous injection of the radionuclide thallium-201 during maximal exercise or symptom-limited exercise have a high sensitivity for the detection of coronary artery disease. The detection rate with such images is higher than with exercise electrocardiography and most series also