Predicting fetal death

Like wine and children, medical specialties mature and develop at different times. Now obstetrics is developing fast with widespread application of biochemical and other techniques—as shown by the proceedings of a symposium on the pathology of pregnancy recently held by the Royal College of Pathologists. The obstetrician’s second patient (who is the one most at risk) is buried in the maternal tissue, so that the predicament is like that of a physician asked to assess a patient in full winter dress and refusing to take off even the greatcoat. In consequence obstetricians are relying more and more on scientific techniques to give them insight about the hidden fetus. Physical or biochemical methods may be used, and possibly a combination will prove to be ideal, but at present most information relates to biochemical techniques and they are well reviewed. The commonly used term “placental function test” is something of a euphemism for “fetal death risk predictor” as effort has been concentrated on trying to answer the relatively simple question, “Is the fetus likely to die in utero?”

Many clinicians are bewildered by the profusion of tests, and indeed the introduction of new methods may have retarded progress when what was needed was a thorough assessment of those already available. Standards need to be established, and it is not (as in adult medicine) merely a matter of determining a single mean and standard deviation; risk zones indicating high possibility of fetal death must be defined, and these need no straightforward relationship to conventional statistical distributions. All this must be done for each week of gestation. There is a great ethical problem, too, in refining new tests predicting fetal death. Strictly, data should be provided on cases in which no action was taken and death occurred; yet once experience suggests that something should be done, that observation cannot be ignored. Furthermore, tests are generally used only when abnormality is detected clinically, and the range of apparent normality may vary for different diseases. The clinician wants to know whether the risk of a particular baby dying in utero is high. The only tests to have received any broad assessment in these terms are estimations of oestrogens and human placental lactogen (HPL) and these are the two tests of most practical use. Common—or clinical—sense is required in applying the results of tests; they represent only one of several risk indicators which must be taken into account. Single assays are widely agreed to be of little or no value, and sequential low or falling levels are of more significance than isolated readings in the “at risk” zone. If the obstetrician contemplates premature delivery because of the likelihood of fetal death he must weigh this chance against the risk of neonatal death from the respiratory distress syndrome. Fortunately the examination of liquor amnii specimens for lecithin has proved of great complementary value in leading to a balanced judgment. The tests have a value, too, when the results are normal, though this fact is often overlooked. Normal results indicate that unless some acute event such as abruptio placenta occurs the fetus is unlikely to die, so preventing the obstetrician from unnecessarily exposing the child to the hazard of premature delivery.

The few studies done on total obstetric populations indicate the help which may be expected from using these tests for unselective screening. Both Australian and American reports have shown that if the oestrogen concentration is subnormal the incidence of intrauterine death is increased fivefold. Nevertheless, before urging general screening of all pregnant women the doctor must give some thought to the practical and analytical aspects. Largely for historical reasons oestrogen estimations are currently most often made on urine, whereas HPL is measured in blood. Technical developments in urinary oestrogen estimations have led to simplification and automation and a reduction in costs, so that single assays probably cost no more than 25p. HPL measurements can be similarly automated, but blood specimens require the physical presence of the patient or a visit to her, which is often difficult to arrange. Results based on collecting 24-hour urine specimens may be influenced by incomplete collection, though oestrogen/creatinine ratios have been claimed to eliminate such problems, but two estimations compound the laboratory error and the expense. Inevitably there is some delay in the time required for urine collection. Such a delay is less important than it may seem, as is conceded in a recent book devoted to plasma hormone assays in pregnancy, because deterioration in the fetus is usually gradual and will be detected if daily assays are performed. Organisation of an efficient daily service is therefore important, probably more so than the choice of whether oestrogen or HPL is measured. Nowadays results can be reported within a few hours of completion of urine collection. Methods for estimating oestrogen concentrations in the blood are also available, but there is no agreement on which form of oestrogen to measure or how to interpret the results. Dynamic tests, in which oestrogen precursors are given to the mother, have been used—but their place is not yet defined and they seem unlikely to have a major role.

Future developments for screening are more likely to be...
towards simpler tests, such as the agglutination inhibition techniques reported, particularly if they can be made sensitive enough to be used on a morning urine specimen. Possibly a "dip" test may become practicable, which could be carried out at each antenatal visit or even daily.

Our present policy rightly emphasises improvement in the quality of life, so that mere reduction in perinatal mortality is seen as inadequate. Possibly for every perinatal death two or three children survive severely damaged. The causes of handicap and its severity vary in different communities at different times. Recently more children with spina bifida and Down's syndrome have survived longer, whereas keraunocus and phenylketonuria are now less frequent causes of long-term handicap. No strict assessment has yet been reported, but there seems no evidence that selective premature delivery of fetuses who have been judged by placental function tests to be seriously at risk has resulted in more long-term morbidity. Even so, clearly further careful trials of known tests for predicting fetal death are needed, especially those which also study the long-term effects of intervention on the child.

Today's harsh economic climate means that every procedure used in obstetric practice should be analysed for its cost-effectiveness. Such a requirement is probably a blessing in disguise, for sound economic practice is usually good clinical practice. An outstanding example of this approach to obstetric and perinatal care is the French Rationalisation des Choix Budgétaires—explained for the English reader in a concise and lucid publication, Prevention of Handicap of Perinatal Origin. The cost of reproductive casualties in France was reckoned at £2000 million per annum at 1976 prices and it was estimated that possibly 30% cases were preventable by systematic application of present techniques. The report recommended that 58% of additional resources should be allocated to improving antenatal care, particularly in increasing the tests done rather than the number of antenatal visits, and in providing referral centres for women at risk. As a comparison of the French approach with British practice put it, "The French Government believe that the major preventive measure is improving the general standard of antenatal and paediatric care. How cost-effective will the British programme be if aid to preventive schemes is paid for by an increase in handicap due to deteriorating standards of prenatal and intrapartum care?"

Tests to discover how the hidden patient is faring are complex, as is organising them and deciding if, when, and how premature delivery should be performed. As Dr Rosalinde Hurley says in her preface, "Many of the procedures ... are only possible if delivery is effected in hospital and it is disheartening to reflect that the pace of advance in obstetric care could decelerate if maternity beds were closed."

Surgery for Menière's disease

The indications for surgical intervention for treating any disease should be clear. When they are not, this usually shows that there is disagreement about the efficacy and merits of the various methods used. At the one extreme, surgical removal of a part may be needed to preserve life when there is little room for difference of opinion. At the other extreme, however, operation may be offered for the relief of symptoms of a disease that does not endanger life in any way. In those circumstances the measures proposed, which may be effective in varying degrees, demand close scrutiny. The quality of life offered and the risks of the procedure must be carefully balanced.

Menière's disease falls into this category. In general, otologists accept that in most patients symptoms can be controlled satisfactorily by conservative treatment. Many would agree that no more than 5% of the cases seen require any form of surgical intervention. To these 5% with disabling but not fatal vertigo, surgery offers a bewildering bouquet of procedures. Furthermore, the patient suffers from vertigo, tinnitus, and deafness: the treatments proposed offer the possible relief of the first and may on occasion affect the second and third.

The procedures vary from the ultra-conservative myringotomy and insertion of a grommet drain to the more radical destruction of the labyrinth. Both may bring speedy relief with comparative safety. No one can say with certainty why the grommet drain works, but undoubtedly many patients find it very effective.

More elaborate procedures may be divided into two categories. Ultrasound and division of the vestibular nerve interrupt the neural pathways carrying misleading labyrinthine information to the brain. Saccus decompression and the subarachnoid shunt procedure seek to relieve the increased fluid tension in the endolymphatic system.

Ultrasound destruction of the vestibular labyrinth was first introduced by Arslan of Padua. Arslan's technique was refined and brought to scientific precision by Angell James in Britain. Nevertheless, while the vertigo was improved in most patients, the relief was not always permanent: hearing was not always preserved; and in the end many patients had to undergo a formal labyrinthectomy.

Decompression of the saccus endolymphaticus is the procedure recommended by Shambaugh. In essence the procedure consists of the microdissection of the saccus exposing its lateral surface in the bony recess in which it lies. This allows the distended saccus to expand into the cortical mastoid cavity created by the operation of access. Few complications follow this procedure, though total death of the labyrinth may occur on the operated side. This operation, too, is not always successful in relieving the vertigo.

In 1962 House introduced a microshunt into the saccus endolymphaticus, draining it into the subarachnoid space via