DR A SAKULA (8): Some years ago I was amazed to find that about seven million budgerigars were kept as pets in Britain—one home in seven had one. So exposure to budgerigars is very common but budgerigar fancier's lung is rare. There must be other factors.

DR SEAL: Another factor is smoking: non-smokers are far more likely to develop an antibody response, and a much higher response, than smokers exposed to the antigens. Perhaps part of this man's illness is attributable to the fact that he was a non-smoker.

PROFESSOR MAHLER: Perhaps every budgerigar should carry a Government health warning.

The conference was recorded and edited by Dr W F Whimster.

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APPOINTMENTS OF SPEAKERS

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Outside Europe

Practical approach to problems of the parturient diabetic in developing countries

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Summary

Improved management of diabetic pregnancies at Lautoka Hospital, Fiji, in 1976 resulted in a neonatal survival rate of 100%. Management included attempts to control the maternal blood glucose concentration with insulin and delaying delivery until there was enough surfactant in the liquor to ensure a viable infant. The techniques are simple to use and require only minimal technological facilities.

Introduction

The Fiji islands have a relatively well developed public health service, some 92% of mothers having their babies in hospital. The western division of Viti Levu, the main island, contains over half the population of 500 000 and has five regional maternity units. These deal mainly with normal deliveries, complicated cases being sent to the divisional hospital at Lautoka. The major racial group in the western division is Indian, mostly from southern India, whose ancestors were brought to work as indentured labour on the sugar cane estates at the end of the nineteenth century, and who now slightly outnumber the indigenous Fijians, who are Melanesians with some Polynesian admixture. Diabetes is more common in Fiji than in Western countries[1] or other Pacific island communities, the increased prevalence being confined almost entirely to the Indian population.

British Overseas Aid Scheme, Lautoka Hospital, Fiji

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Patients and methods

In Lautoka Hospital, as in most base hospitals in developing countries, facilities exist for determining blood glucose concentrations but not for sophisticated techniques such as ultrasound, tests of placental function, or assessment of lecithin:sphingomyelin (L:S) ratios. Furthermore, there are no specialist paediatric staff, and neonatal care consists largely of incubation and nursing. Few patients are aware of the date of their last menstrual period, and maternal age is often advanced, causing problems of high parity. Pre-eclampsia is also common, especially in Indians.

Up to 1975 most pregnant diabetics were treated with tolbutamide, insulin being reserved for severe cases. Patients were admitted to hospital before delivery only if there were complications of the diabetic state. In 1975, however, the unit policy was changed to one based on the regimen used at King's College Hospital, London.[2 3] Patients were admitted to hospital from 32 weeks and, unless the disease was very mild, treated with insulin. Blood glucose was measured two hours after each meal on two days each week, the aim being to achieve as near normal concentrations as possible (less than 8·3 mmol/l; 150 mg/100 ml). Delivery was planned for the 38th

week as determined by palpation and radiological evidence of maturity. Vaginal delivery was usually allowed, but caesarean section was performed if there were any obstetric complications or when labour lasted more than 18 hours.

In 1976 several important additions were made to the regimen. Within one week of the planned date of delivery patients were given intramuscular dexamethasone 8 mg eight-hourly for 48 hours in an attempt to stimulate surfactant synthesis in the fetal lungs.[4] Once a week from the 36th week in uncomplicated cases 10 ml of liquor was obtained by amniocentesis and used in a "shake" test in the ward laboratory to assess the amount of surface-active agents produced by the fetal lungs.[5] In patients with pre-eclampsia or fetal growth retardation the test was performed twice weekly. Patients with hypertension, with or without proteinuria, a poor obstetric history, or who were unsure of their dates often began these tests when they were thought to be at 34 weeks' gestation. No patient was induced until the result of the test was unequivocally positive. No reliance was placed on radiological signs of maturity, since in diabetic fetuses these can appear much earlier than usual.[6] Finally, increased use of elective caesarean section was made for all patients aged 35 or over, those with a poor obstetric history, and those with persistent or worsening pre-eclampsia. In addition, emergency caesarean section was undertaken if delivery was not imminent after eight to 10 hours, since there were no facilities for intrapartum fetal monitoring.

Results

Table I summarises the results of treatment during 1965, 1975, and 1976, 1965 being used to represent a typical year before the unit policy was changed, as during that year statistics were known to have been accurately collected. Perinatal mortality was 47% in 1965, 45% in 1975, and zero in 1976.

TABLE I—*Treatment regimens used in 1965, 1975, and 1976*

	1965	1975	1976
	Oral hypoglycaemic agents: hospital admission before delivery for complications only	Admission from 32 weeks; control with insulin; regular blood sugar measurements	
		Delivery at 38 weeks	Delivery when "shake" test result positive; steroids given if earlier delivery contemplated
No of patients	19	11	21
Indians	17	11	19
Fijians	1		1
Others	1		1
No aged 35 years and over	8	2	9
Average gravidity (range)	7 (2–15)	5 (3–8)	5 (1–10)
No delivered by LSCS	2	2	12
No undergoing tubal ligation	0	8	16
Average birth birth weight (g)	3547	2858*	3112
No (%) of perinatal deaths	9 (47)	5 (45)	0
Stillbirths	5	3	0
Neonatal deaths (No due to RDS)	4 (3)	2 (2)	0

LSCS = Lower segment caesarean section.
RDS = Respiratory distress syndrome.
*One immature stillbirth 29 weeks of gestation.

Details of the 21 patients treated during 1976 are given in table II. Except for the Fijian and one part-European woman all the patients were Indians. Nine patients (43%) were of advanced maternal age (over 35), and three were over 40. This is particularly striking in a community where early marriage is the rule and most girls start their reproductive life between the ages of 16 and 18. Most of the patients of advanced age had had long intervals of infertility since their previous pregnancies. There were many patients with a poor obstetric history or previous complications of pregnancy, 15 (71%) of them having had at least one perinatal loss. In addition seven patients had had hypertension with proteinuria at some stage of the pregnancy, and three had suffered severe pre-eclampsia.

TABLE II—*Analysis of all pregnant diabetics treated during 1976*

Case No	Race	Age (years)	Gravidity	Sureness of dates	Past obstetric history	Gestational age at delivery (weeks)	Birth weight (g)	Type of delivery	Tubal ligation performed	Outcome	No of times blood glucose concentrations measured in following ranges (mmol l): 8·3–11·0	11·1–13·8	13·9–16·6	≥ 16·7	Indication for LSCS	Degree of control
1	Indian	33	7	Sure	2 NND, 1 SB	37	2994	Spontaneous vaginal LSCS	+	Alive and well	1				Poor obstetric history, advanced maternal age	Good
2	,,	42	10	Unsure	3 SB	38?	2869	,,	+	,,	7	4			Advanced maternal age, breech presentation, hypertension	Fair
3	,,	39	8	,,	1 SB, 1 NND	36?	2767	Induced vaginal	+	,,	5	3				Fair
4	,,	26	5	,,		39?	3130	,,	+	,,	6	2				Fair
5	,,	30	5	Sure		38	2767	Spontaneous vaginal LSCS	+	,,	1				Advanced maternal age	Good
6	,,	38	3	,,	2 NND	36	3221		+	,,	2	7		1	Advanced maternal age	Poor
7	,,	37	9	Unsure	1 SB	36?	2785	,,	+	,,	5	1			Advanced maternal age, severe PET	Fair
8	,,	39	5	,,	1 NND	37?	3493	,,	+	,,	6	9		1	Advanced maternal age, severe PET	Poor
9	,,	43	7	,,	2 SB, 1 NND	37?	3230	,,	+	,,	4	8	3		Advanced maternal age, hypertension, and intermittent PET	Poor
10	,,	41	4	,,	1 NND	37?	3175	,,		,,	5	8	2		Advanced maternal age, severe PET	Poor
11	,,	24	3	,,	2 SB	38?	2722	Spontaneous vaginal LSCS	++	,,	2					Good
12	,,	38	8	Sure	1 NND	37	2858	Induced vaginal LSCS	++	,,	8	1			Advanced maternal age	Fair
13	Fijian	34	4	Unsure		39?	3969			,,	1					(Late booking)
14	Indian	33	1	Sure	1 MC, 7 years infertile	38	3583		+	,,	6				7 years' infertility	Fair
15	,,	33	3	,,		37	3039	,,	++	,,	1				Previous LSCS (CPD)	Good
16	,,	27	4	,,	1 SB	36	2781	Spontaneous vaginal	++	,,						Good
17	,,	25	3	,,	1 SB	37	3679	,,		,,	5	6	2			Poor
18	PE	29	4	Unsure	1 MC	39?	3992	,,	+	,,	12			3	Failure to progress in labour	Fair
19	Indian	29	3	,,		38?	2812	LSCS APH, EUA ARM		,,						Good
20	,,	25	3	Sure	1 SB	38	3679	Spontaneous vaginal LSCS	+	,,	7	2				Fair
21	,,	38	7	Unsure	2 NND	?	2858			,,	6	2			Advanced maternal age, severe PET	Fair

PE = Part-European. NND = Neonatal death. SB = Stillbirth. MC = Miscarriage. APH = Antepartum haemorrhage. EUA = Examination under anaesthesia. ARM = Artificial rupture of membranes. PET = Pre-eclamptic toxaemia. CPD = Cephalopelvic disproportion.

Conversion: SI to traditional units—Blood glucose: 1 mmol l ≈ 18 mg 100 ml.

The extremely critical timing of delivery was made more difficult by many of the patients being unsure of their dates. The actual number of such cases was almost certainly higher than we knew, since many of the patients adhered rigidly to dates given to them by older relatives. This problem was compounded by the fact that patients in Fiji rarely book earlier than the mid-trimester, so that bimanual examination in early pregnancy is rarely possible. Two patients (11%) underwent caesarean section in 1965 compared with 12 (57%) in 1976. In most Western centres the overall section rate in diabetics is around 50%, the increased number at Lautoka largely being due to advanced maternal age and the prevalence of pre-eclampsia.

The relatively low average birth weight in 1976 (3112 g) was due both to the careful antenatal control of the blood sugar concentration and to the fact that Indians tend to have smaller babies than Europeans or Fijians. Nevertheless, the average birth weight among patients in the 1965 series, who were treated with oral hypoglycaemic agents, was 3547 g, suggesting that control of the blood glucose concentration with insulin was responsible for the lower weight.

Three-quarters of the patients were sterilised after delivery in 1976 compared with none in 1965. The prolonged hospital stay and the many investigations carried out combined with an intensified family planning campaign were important contributory factors.

Although the aim of blood sugar control with insulin was to keep the blood sugar concentrations below 8·3 mmol/l (150 mg/100 ml), this was often not achieved (table II). Owing to limited laboratory facilities blood sugar concentrations were measured two hours post-prandially on only two days each week, and the problems of measurement were further compounded by a lack of quality control in the laboratory and a disturbing tendency for the results to vary with the skill of the technician. Good control was consistently achieved in only six of the 21 patients. Nine patients repeatedly had blood sugar concentrations above 8·3 mmol/l and five were poorly controlled. One patient booked too late for the degree of control to be assessed.

Discussion

These results show that in developing countries with limited technological facilities a greatly improved perinatal survival rate may be achieved after diabetic pregnancies.

It is difficult to assess the contribution of antenatal admission from 32 weeks and moderate control of blood sugar concentrations to the improved survival rate. Antenatal admission was certainly important since bed rest could be enforced, particularly in the case of patients over 35, and energy intake could be strictly supervised. It was also useful in the early detection of pre-eclampsia, an important factor in Fiji since most Fijian Indians come from southern India, where pre-eclampsia is particularly prevalent.[7]

Because strict blood sugar control was not feasible it was essential to deliver the fetus as soon as pulmonary maturity was attained. The respiratory distress syndrome had made a large contribution to neonatal mortality in the past and it was unfortunate that many of these deaths had been due to early induction of labour carried out largely because of concern over pre-eclampsia, fetal growth retardation, or uncertain dates.

The dramatic reduction in perinatal mortality to zero in 1976 with many high-risk patients was mainly due to methods introduced to stimulate surfactant synthesis and detect fetal lung maturity. This reduction is particularly relevant to developing countries where facilities do not exist for treating the respiratory distress syndrome.

In many diabetic patients the expected preterm rise in amniotic fluid lecithin does not occur,[8] and dexamethasone was given to all but three of the patients in this series a week before the planned date of delivery to encourage early surfactant synthesis.[9] Chronic fetal distress acting through the fetal adrenals might be expected to induce an early rise in surfactant levels but this has been found not to be the case.[10] The three patients with severe pre-eclampsia seen in 1976 had all developed hypertension and proteinuria in previous pregnancies and had all lost babies from the respiratory distress syndrome due to premature induction. It is usual to administer steroids whenever there are medical indications to deliver an immature fetus, but it is necessary to monitor maternal blood sugar concentrations carefully since these can induce a large increase in insulin requirements.[11]

To determine the time when the fetal lungs reached functional maturity the shake test was used. This test, introduced by Clements *et al* in 1972[5] to measure the amount of surfactant produced by the fetal lung, is a simple modification of the L:S ratio test. The test relies on the presence of enough surfactant to maintain a stable film of bubbles in the presence of ethanol. The test requires only a set of five clean test-tubes, some alcohol and saline, a measuring pipette, and a clock and can be performed in 20 minutes, so that the result is available soon after the amniocentesis. Although not as accurate as the L:S ratio or the absolute lecithin value, it has the advantage of simplicity and cheapness, and because it can be performed on the ward by the obstetric staff it involves them more directly with the primary care of the patient and the active interpretation of the results. In addition, by excluding laboratory personnel there is less room for error, since the test is carried out by the same doctor who performs the amniocentesis.

A further advantage of the test derives from the fact that if the result is positive (a complete ring of bubbles in the test-tube at dilution of 1/2 at the meniscus 15 minutes after shaking) the L:S ratio is almost certainly higher than 2:1. Although false-negative results may occur, Wagstaff and Bromham[12] have shown that on no occasion was the shake test result positive when the L:S ratio was less than 2:1. This was confirmed by Bhagwanani *et al*.[13]

After experimenting with the test towards the end of 1975 (mainly on patients with pre-eclampsia and fetal growth retardation) we became so convinced of its value that none of the diabetic patients in 1976 were electively delivered unless the result was unequivocally positive. The three patients in the series with severe pre-eclampsia required intravenous diazepam infusions, intravenous hypotensives, and intensive nursing care. Although termination of pregnancy would have been mandatory for the sake of the mother if oliguria had developed, this regimen was maintained for up to 10 days until the presence of surfactant in the liquor indicated that there was a chance of delivering a live baby who would not die of the respiratory distress syndrome.

A recent report[14] questioned the value of the L:S ratio in diabetics. According to Robert *et al*[15] diabetes is associated with a fivefold increase in the respiratory distress syndrome, and this is possibly explained by the fact that in tissue culture insulin retards the incorporation of lecithin into fetal lung cells.[16] Severe fetal hyperinsulinaemia associated with poor blood sugar control would be responsible for the increased incidence of the respiratory distress syndrome, and it is interesting to note that in the present series no cases of the syndrome occurred despite relatively poor control of the blood sugar. Whitfield *et al*[17] found that some diabetics show a steep terminal fall in the L:S ratio, which is probably associated with failing surfactant production, and it is possible that by performing serial shake tests from 34 weeks of gestation in the poorly controlled diabetics and by delivering the babies when the results became positive we were able to avoid this problem.

Such intensive care requires an enthusiastic and interested junior staff and considerable co-operation from the patients. It could be argued that the bed usage is uneconomical in developing nations where overpopulation is the most pressing social problem. It is suggested, however, that the successful management of diabetic pregnancy avoids the expense and distress of recurring obstetric disaster and, when associated with an active sterilisation programme, might actually limit the number of diabetics.

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What are the indications for arthroplasty of the knee joints? Is Charcot's disease a contraindication? What investigations can be done to confirm or exclude Charcot's disease?

Indications for arthroplasty of the knee joint are severe pain and loss of function in patients with osteoarthritis or rheumatoid arthritis. At present most surgeons would confine this operation to patients with osteoarthritis aged over 60, in whom osteotomy is not considered suitable. In rheumatoid arthritis operation at a younger age is justifiable, and in some centres the operation has even been done on teenagers with juvenile rheumatoid arthritis when no other treatment is available to restore mobility. Most surgeons would consider Charcot's disease a contraindication as the loss of pain appreciation results in a greater strain being put on the knee replacement and often disruption of the cement-bone fixation. There are no specific investigations to confirm or exclude Charcot's disease. A Charcot joint is a neuropathic joint and most commonly due to tabes dorsalis, diabetes mellitus, or syringomyelia. There are other rare causes. Routine investigation usually excludes tabes but a Charcot joint must be diagnosed on clinical grounds and suspicion should be aroused at a joint where the degree of disorganisation of the joint is out of all proportion to the relative painlessness. Not all Charcot joints are completely painless.

A patient cannot tolerate lignocaine because of syncopy. General anaesthesia is undesirable owing to tracheal stenosis. Is there any alternative local anaesthetic that might be used with safety?

Syncopy after the use of lignocaine is usually due to fear: occasionally it might be the first sign of cardiovascular collapse after the absorption of an overdose of the drug and rarely is it due to an anaphylactoid reaction in a patient sensitised to the drug. Before using an alternative drug it would be advisable to determine which was the cause. If it was associated with fear reassurance, suitable premedication such as diazepam, and the use of lignocaine with the patient lying down may be all that are needed. Overdosage should not, of course, occur. If there is a true anaphylactoid reaction an ester-linked drug such as procaine may be safe. The presence of tracheal stenosis is a major hazard. Any operation planned on such a patient should be undertaken only by those conversant with the hazards with suitable facilities for resuscitation. Oxygen should be administered throughout the operation.

Is breast-feeding contraindicated if the mother is on anticonvulsant drugs?

No, but certain anticonvulsant drugs may pass through into the breast-milk, notably barbiturates, phenytoin, bromides, diazepam, and carbamazepine. Barbiturates and bromides could cause drowsiness and bromides could cause a rash. Carbamazepine may be found in the breast-milk in a concentration about two-thirds of that in the plasma. Diazepam might raise the infant's serum bilirubin by competing for glucuronyl transferase; and it could cause some drowsiness. It is unusual for these drugs to cause any symptoms in the baby so that breast-feeding is not contraindicated. Whether the mother is breast- or bottle-feeding remember that if her epilepsy is incompletely controlled she might drop the baby if she has a fit.

What is the current treatment for primary syphilis?

Penicillin is the most effective treatment for primary syphilis. After accurate diagnosis it is current practice to give the patient intramuscular injections of procaine penicillin, 600 000 units daily for 10 successive days. This treatment should cure 95-98%, and retreatment is seldom necessary. Longer acting penicillin preparations, such as benzathine penicillin given as two intramuscular injections of 2·4 megaunits each at a three-week interval, have been widely recommended in the USA. Unfortunately, penicillin given in this way does not always penetrate into the cerebrospinal fluid, and it is therefore probably wiser not to use these long-acting preparations.[1]

For patients sensitive to penicillin erythromycin or tetracycline is used. As these preparations are taken by mouth patient compliance is important. The dosage is 500 mg six-hourly for 15 days—a total of 30 g. There have been no satisfactory long-term follow-up studies with these preparations, and many doctors give a second course of treatment with the same antibiotic at the same dosage three months after completing the first course. The patient should be warned that about 40% of patients may expect a Herxheimer reaction. The importance of the diagnosis and the infectious nature of the condition should be explained to the patient, who should be requested to avoid any form of sexual contact until treatment is completed. Detailed contact tracing is of the utmost importance and should be carried out thoroughly. The importance of follow-up to establish that cure is permanent should be explained to the patient. The usual period of surveillance is two years, after which the patient should be reassured that cure has been complete.

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What is the prognosis and treatment for the Duchenne type of muscular dystrophy?

The Duchenne type has been subdivided into three categories: (*a*) the severe sex-linked recessive form, (*b*) the mild sex-linked recessive form, and (*c*) the mild autosomal recessive form. These are said to occur in the ratio of 27:3:5 respectively. The severe sex-linked form has been studied most and it usually appears during the second and third years of life, thus interfering with the beginning of locomotion. Onset after the age of 10 would place the case in the second category of the milder disease. Females may transmit the disease but seldom suffer from it. The carrier female can be identified with about 80% accuracy using the creatine kinase test on serum. This is slightly raised. Also a muscle biopsy specimen may show a slight dystrophic change, and there may be a myopathic electromyelogram. In the severe case the child may be confined to a chair before the age of 12. Fatality is frequent during the second decade of life owing to obesity, kyphoscoliosis, and possible cardiac failure and pulmonary insufficiency from recurrent infections. Cardiac involvement is commonly observed in the late stages of disease and presents with tachycardia and also by early heart failure. There may be prolongation of the P-R interval and slurring of the QRS complex, bundle-branch block, and elevation or depression of the ST segment in the electrocardiogram. The milder types have a much better prognosis as they start considerably later in life. Nothing helps this disease except treatment for the complications as they arise, which orthopaedics and physiotherapy may help.