HOUSE PHYSICIAN: But does not phentolamine, an alpha blocking drug, also reduce blood pressure?

Dr. WOOD: Yes, but alpha blockade is very hard to control, and is almost never used therapeutically. Alpha effects are mostly stimulatory and noradrenaline produces these more readily than adrenaline (Fig. 2). They include vasoconstriction in the gut and skin vessels, and pupillary dilatation due to contraction of the radial muscle of the iris. Synthetic amines such as metaraminol, which have mostly alpha effects, are, and may be used as, pressors. Alpha blocking drugs like phentolamine antagonize metaraminol and the alpha effects of noradrenaline. Their hypotensive action is most definite when the blood pressure is being kept up by noradrenaline release.

This was the basis for using phentolamine in a diagnostic test for phaeochromocytoma.

Professor MACGREGOR: To sum up, an understanding of the pharmacology of the sympathetic nervous system is essential if the drugs used in hypertension are to be used safely and effectively. The four patients illustrate the spectrum of essential hypertension. The more severe cases need treatment and the outlook is improved by treatment. The problem area remains mild hypertension, where the effect of treatment on prognosis is uncertain and where each doctor must still make up his own mind about the lower level of a raised blood pressure which requires treatment.

Hospital Topics

Obstetric Anaesthesia Services in the United Kingdom

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Summary

In a survey of obstetric anaesthetic services in the United Kingdom questionnaires were sent to 398 hospital maternity units and 347 general-practitioner maternity units, of which 344 and 272 respectively were returned. Many hospitals were unable to provide an anaesthetist for obstetric surgery only, and few consultant anaesthetist sessions were allocated to obstetric surgery, particularly in regional hospitals in England and Wales. Constant supervision of junior anaesthetic staff with under 12 months' experience was lacking in several hospitals. Endotracheal intubation is widely used throughout the United Kingdom. Though regional analgesic techniques are used by most anaesthetists it is impossible to provide a 24-hour regional analgesic service in all but a few hospitals.

Introduction

The *Report on Confidential Enquiries into Maternal Deaths in England and Wales, 1964-66* (Arthure *et al.*, 1969) has given rise to anxiety in anaesthesia and obstetric circles (Crawford, 1970; *British Medical Journal*, 1970). While every other cause of maternal death has decreased in the past 15 years, those due to anaesthesia have increased. The confidential inquiry does not set out to give the reasons for these deaths. As a result the possible deficiencies which occur during obstetric anaesthesia are left to conjecture.

The present survey was designed to determine as near as possible the anaesthetic cover for maternity units over the 24-hour period, including the number of consultant obstetric

anaesthetic sessions. Other aspects of the survey dealt with types of general anaesthesia used and whether regional analgesic techniques were available. In addition, the anaesthetist's traditional role in neonatal resuscitation was examined.

Method

As a result of a pilot survey conducted in about 90 hospitals a more comprehensive inquiry was carried out. The present survey was divided into two phases. Firstly, secretaries of hospital management committees concerned in maternity services were asked to give the names of hospitals with maternity beds, the number of deliveries there per annum, and the name of the consultant anaesthetist responsible for the obstetric anaesthesia service; 95% of the circulars were returned. Secondly, two types of questionnaire were sent to the consultant anaesthetist in charge. The first, which comprised three pages and was designed for maternity units in hospitals, inquired into anaesthetic cover for obstetric surgery, including the number of consultant obstetric anaesthetic sessions, and also the use of general anaesthesia and regional analgesic techniques. A second, short questionnaire was for general-practitioner units where essentially only normal deliveries occur. In all instances first-class postage was used and stamped addressed envelopes were enclosed. The dispatch and return of questionnaires was completed between October 1969 and February 1970. The data were then put on to Visiscan punched feature cards and the results checked.

Results

For this survey the United Kingdom was divided into four parts—namely, teaching hospitals in England and Wales (those hospitals as defined by the *Hospital Year Book*, 1970), regional hospitals in England and Wales, and all hospitals in Scotland and in Northern Ireland. The coverage of the survey and the number of questionnaires returned from hospital maternity units are shown in Table I. The survey had a bet-

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TABLE I—Coverage of the Survey

	Teaching	Regional	Scotland	N. Ireland
No. of hospitals included in the survey	33	301	42	22
No. of questionnaires returned	33 = 100%	255 = 100%	39 = 100%	17 = 100%
Hospitals with integral maternity units	79%	78%	62%	88%
Anaesthetist first on call within grounds	82%	30%	18%	12%
Anaesthetist on call for obstetric surgery only	39%	15%	41%	24%

ter than 75% sample from maternity units in all four parts of the United Kingdom.

In all sections of the survey a few maternity units are separate hospitals. Mostly these do not have an anaesthetist in the building, and therefore in an emergency where anaesthesia is required there may be some delay. The anaesthetist first on call lives within the hospital grounds in most teaching hospitals, but the reverse is true in the other three parts of the survey. Where the anaesthetist first on call lives outside the hospital, however, he is often readily available within 15 minutes at night. In nearly all hospitals an anaesthetist is usually available for obstetric anaesthesia and other emergencies. Only 15% of regional hospitals can provide an anaesthetist for obstetric surgery only, despite the fact that 28% of hospitals in this part of the survey have more than 2,000 deliveries per annum per hospital.

No consultant anaesthetic sessions are allocated to obstetrics in most hospital maternity units. By far the largest number of maternity units are in regional hospitals, and the number of allocated obstetric anaesthetic sessions is low—a total of 84 for 255 hospitals (Table II). Since most obstetric

TABLE II—Consultant Obstetric Anaesthetic Sessions

	Teaching	Regional	Scotland	N. Ireland
Hospitals where sessions are allocated	36%	20%	38%	18%
No. of sessions allocated	50	84	69	19
Average No. of sessions for hospitals with allocation	4.1	1.5	5.3	6.3

operations are emergencies, these are therefore included in anaesthetic time allocated for emergency sessions. Several hospitals include elective caesarean section on gynaecological lists, mainly for convenience. If one elective caesarean section were to take place each week during gynaecological operating lists the number of additional sessions in regional hospitals would be increased by about 40. If this correction factor were applied to the rest of the survey there would be an additional four sessions in each part.

Many hospitals have different grades of anaesthetists available for obstetric anaesthesia (Table III); however, in teaching and regional hospitals most first-on-call duty is performed by senior house officers and registrars. In Scotland and Northern Ireland many consultants are first on call for obstetric surgery.

The answer to the question "who usually anaesthetizes for elective obstetric surgery?" was often multiple. If two grades were considered to share the duties it was assumed that this was done in equal proportion, except where definite percentages were indicated by the consultant answering the questionnaire. In most hospitals throughout the survey consultants usually give anaesthetics for elective obstetric operations (Table III). Emergency obstetric anaesthesia, however, is provided predominantly by registrars in England and Wales, but by consultants in Scotland and Northern Ireland.

There is no constant supervision of senior house officers performing obstetric anaesthesia in some hospitals. In England, Wales, and Scotland senior house officers in anaesthesia usually have under 12 months' experience, whereas

TABLE III—Grade of Anaesthetist First on Call and who Usually Anaesthetizes for Obstetric Surgery

	Teaching	Regional	Scotland	N. Ireland
Grade of anaesthetist first on call				
{ S.H.O.	25%	30%	16%	10%
{ Registrar	67%	47%	33%	19%
{ Consultant	0	10%	29%	55%
{ Other	8%	13%	22%	16%
Grade of anaesthetist who usually gives elective obstetric anaesthesia				
{ S.H.O.	12%	11%*	3%†	6%
{ Registrar	33%	28%	16%	18%
{ Consultant	33%	47%	55%	58%
{ Other	22%	11%	18%	18%
Grade of anaesthetist who usually gives emergency obstetric anaesthesia				
{ S.H.O.	16%	19%	10%	9%
{ Registrar	58%	50%	32%	26%
{ Consultant	8%	23%	34%	50%
{ Other	18%	13%	24%	15%

* In 3% of hospitals in regions elective obstetric surgery is not performed.
† In 8% of hospitals in Scotland elective obstetric surgery is not performed.
S.H.O. Senior house officer.

TABLE IV—Hospitals without Constant Supervision

	Teaching	Regional	Scotland	N. Ireland
Hospitals without constant supervision of senior house officer during elective obstetric surgery	15%	28%	10%	6%
Hospitals without constant supervision of senior house officer during emergency obstetric surgery	18%	41%	23%	18%
Hospitals without definite day consultant rota	12%	8%	15%	6%
Hospitals without definite night consultant rota	18%	3%	10%	6%

in Northern Ireland they often have more. The percentage of hospitals where constant supervision does not take place during elective and emergency obstetric surgery is higher for emergency surgery compared with elective surgery in all four parts of the survey (Table IV). Several hospitals indicated that there was no definite consultant anaesthetic rota available. No relationship was found, however, between hospitals without constant supervision of senior house officers and the lack of a definite consultant anaesthetic rota.

Intubation plays a major part in obstetric surgery, though on occasions the mask-only technique is used for retained placenta (Table V). In more than 85% of all hospitals

TABLE V—General Anaesthetic Technique

	Teaching		Regional		Scotland		N. Ireland	
	M	I	M	I	M	I	M	I
Caesarean section	5%	95%	1%	95%*	0	97%†	0	100%
Vaginal delivery	5%	92%‡	13%	87%	15%	85%	18%	82%
Retained placenta	14%	83%‡	25%	75%	23%	77%	35%	62%

M = Mask only.

I = Intubation.

* In 10 hospitals (4%) caesarean sections are not performed.

† In one hospital (3%) caesarean sections are not performed.

‡ In one hospital (3%) all vaginal operations are performed under epidural analgesia.

ventilators are available in the operating theatre for caesarean section, while in most they are also available in the delivery room. In 45% of teaching and Scottish hospitals the paediatrician is summoned during obstetric surgery to resuscitate the baby where necessary, whereas in the regional hospitals and Northern Ireland he is seldom called. If the paediatrician is not available the anaesthetist performs neonatal resuscitation in over 80% of all hospitals.

Most anaesthetists in the United Kingdom perform regional analgesic techniques (Table VI). Lumbar epidural anaesthesia seems to be the main method used, particularly in general surgery and gynaecology. Apart from several teaching hospitals, however, it is virtually impossible to run a 24-hour obstetric regional analgesic service.

TABLE VI—Ability and Availability to Perform Regional Analgesic Techniques

	Teaching	Regional	Scotland	N. Ireland
Ability to perform regional analgesic techniques . .	82 %	35 %	28 %	18 %
Availability to perform regional analgesic techniques . .	55 %	8 %	8 %	18 %

Of the 347 questionnaires sent to general-practitioner maternity units in the United Kingdom 272 were returned. In 91% of these units there were fewer than 750 deliveries per annum. Few general anaesthetics were given in these units, primarily because patients who were admitted there were expected to have a normal delivery. In 82% of general-practitioner maternity units either no anaesthetics were given or these were fewer than one a month. In most units the general anaesthetic was given by a general practitioner, though occasionally a consultant or the flying squad anaesthetist would be concerned.

Discussion

This survey, as with all other surveys, suffers from the problem of asking the correct question and obtaining the correct answer. Anaesthetic cover and techniques of course vary from hospital to hospital. The questionnaire, though not ideal for every hospital, produced some interesting results. Many consultant anaesthetists wrote at length indicating specific local differences which could not be brought out with the questions.

Ideally, the services of an anaesthetist would be available for obstetric surgery only, particularly in larger units. There were 103 hospitals in the survey, representing 30% of maternity units, where more than 2,000 deliveries occur annually. If regional analgesic techniques are to be incorporated in obstetric practice in Britain then an obstetric anaesthetist without other duties will be essential. Maternity units which are separated from main hospitals are particularly vulnerable to delay in obtaining anaesthesia services.

The number of consultant obstetric anaesthetic sessions allocated to maternity units is insufficient, particularly in regional hospitals. The National Tables of Hospital Medical Staff in post on 30 September 1969, England and Wales, state that there are 2,197 whole-time equivalent surgical appointments (all specialties) (Department of Health and Social Security, 1970). These figures include 455 combined obstetric and gynaecological appointments. If an obstetric and gynaecological consultant divides his time equally between the specialties then there are 227 whole-time consultant obstetricians in England and Wales. Thus the ratio of consultant surgical (except obstetric) to consultant anaesthetic appointments is about 2:1. The survey showed that there were the whole-time equivalent of 13 consultant obstetric anaesthetic appointments in England and Wales. The ratio of consultant

obstetricians to consultant obstetric anaesthetists is about 17:1. Even allowing for the fact that childbirth is a fundamentally normal procedure there is serious understaffing at a senior level to cope with the vagaries of obstetric surgery.

Most obstetric operations are on an emergency basis and therefore are usually included with other surgery and anaesthetic time allotted to emergency sessions. The confidential maternal mortality report states: "Patients with obstetric emergencies are gravely at risk and require the knowledge and skill of an experienced anaesthetist who must be readily available." Any obstetric patient who has been in labour must be regarded as an emergency owing to the possibility of a full stomach. In many instances, particularly in regional hospitals, a senior house officer may be obliged to anaesthetize obstetric patients unsupervised because of the lack of experienced anaesthetic personnel available to maternity units. There are some hospital groups, predominantly in the London area, where a definite consultant anaesthetic rota is not available and where serious delay may occur in obtaining experienced advice or assistance. Once again this is due to inadequate staffing.

Moreover, since most obstetric general anaesthetics throughout the United Kingdom entail intubation, experienced personnel must be available to intubate these patients. The mask-only technique, though safe in certain instances, offers little protection to the lungs should the patient vomit or regurgitate. Lumbar epidural analgesia is a possible alternative to general anaesthesia, particularly where vaginal deliveries are concerned. From my experience in a midwife teaching hospital, where about 75% of the deliveries are normal, epidural analgesia is used for about half of the remaining obstetrician deliveries; this represents a 10-15% epidural rate for all deliveries in hospital. In this way general anaesthesia is avoided for most operative vaginal deliveries.

Traditionally the anaesthetist has carried out neonatal resuscitation, particularly when the mother was anaesthetized, thus depriving her of his immediate attention. Moreover, if a relaxant anaesthetic was used then ventilation would have to be carried out by a nurse or an anaesthetic technician. The use of reliable ventilators, however, has alleviated the situation. Since in most hospitals a paediatrician is not available for operative deliveries, the responsibility for neonatal resuscitation rests heavily on the anaesthetist.

I found that junior anaesthetic personnel, who may be inexperienced, undertake obstetric anaesthesia unsupervised very early in their career. Since consultant obstetric anaesthetic sessions are few compared with the demands of other surgical specialties on anaesthetic time, opportunities for teaching and ensuring that good anaesthetic facilities exist in maternity units are limited.

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