Middle Articles

GENERAL PRACTICE OBSERVED

Survey of General-practitioner Maternity Units in England and Wales

M. S. T. HOBBS,* M.B., M.R.A.C.P.

Brit. med. J., 1967, 4, 287-290

This paper is one of a series describing an investigation into the organization of the obstetric services in England and Wales (Acheson and Feldstein, 1964; Hobbs and Acheson, 1966a, 1966b). Previous studies in the series had shown that in the Oxford area general-practitioner maternity units are used as an alternative to consultant care for mothers with both high and low risks of perinatal mortality. Furthermore, the proportion of high-risk mothers booked for consultant care decreases sharply as the distance from the nearest consultant unit increases when general-practitioner beds are available as an alternative, but no similar decrease is observed when such beds are not available. Though the number of G.P. units in the area available for study was small, there was a suggestion that the proportion of high-risk mothers selected for delivery in consultant units was greater when the G.P. beds were incorporated in a consultant unit or when the G.P. unit was visited regularly by a consultant for antenatal consultations. In view of the possible implications of these findings for planners of the maternity services, it was felt that additional information about G.P. maternity units should be obtained from a national survey.

The objectives of the survey were as follows: (1) to examine the geographical relation of G.P. units to consultant units; (2) to examine the extent to which direct liaison exists between consultant maternity units and G.P. maternity units for selection of cases, provision of antenatal care, and management of complications in labour; and (3) to assess the standard of equipment and other facilities of G.P. maternity units necessary to deal with obstetric emergencies and resuscitation of the newborn.

Material and Method

In 14 of the 15 hospital regions of England and Wales the permission of the senior administrative officer was obtained to send postal questionnaires to the G.P. maternity units within the region. Permission was granted to send these direct to the matrons in seven regions, and through the group secretaries concerned in six regions, with the request that the forms be completed with the assistance of the matrons. In the remaining region completion of the forms was undertaken by the regional hospital board concerned.

Replies were received from 274 of the 288 units to which the form was sent. The information recorded on the forms was transferred to 80-column punch cards, and the subsequent

analyses were carried out with the aid of standard business machines.

Geographical Relation of G.P. Units to Consultant Units

Distance from Nearest Consultant Unit.—In Fig. 1 the distribution of units by distance measured in miles from the nearest consultant unit is shown. Eight units (2.9%) were completely integrated with consultant units, and five further units (1.8%) were situated at distances of less than half a mile (800 m.) from the nearest consultant unit, making a total of 13 (4.7%) situated in close proximity to a consultant unit. Seventy-five units (27.4%) were situated from half to five miles (0.8 to 8 km.) distance, 66 (24.1%) from 5 to 10 miles (8 to 16 km.), and the remaining 120 units (43.8%) were situated more than 10 miles from the nearest consultant unit.

FIG. 1.—Distribution of G.P. maternity units according to distance in miles from the nearest consultant unit.

This finding suggests that in a large proportion of G.P. units a considerable interval may elapse when it is necessary to transfer obstetric emergencies to consultant units. Correct initial selection to avoid such situations is therefore of great importance.

Contact with Consultant Obstetricians

In G.P. units which are physically integrated with consultant units on the same site close liaison between consultants and general practitioners using the units can be assumed to exist. The analyses which follow are therefore confined to the remainder—that is, the self-contained general-practitioner maternity units.

* Formerly Lecturer in Medicine, Oxford Record Linkage Study and Unit of Clinical Epidemiology, Nuffield Department of Clinical Medicine, University of Oxford.

Requests for reprints should be addressed to the Medical Director, Oxford Record Linkage Study, Oxford Regional Hospital Board, Old Road, Headington, Oxford

Contact in Antenatal Period

The inquiry was directed towards determining in which units (i) a consultant obstetrician is responsible for selecting cases for delivery in the unit; (ii) a consultant reviews the progress of all women selected for delivery in the unit in late pregnancy; (iii) a consultant visits antenatal clinics held at the unit to review complicated cases only; and (iv) no special arrangement for consultation exists apart from the referral of the complicated case to a consultant antenatal clinic by the G.P.

The extent to which units have some special arrangement for consultant obstetricians to see cases in the antenatal period—that is, i-iii—referred to as “consultant contact during the antenatal period,” is shown in Fig. 2. In 66 units (24.8%) a consultant obstetrician selects the cases to be delivered in the unit and also reviews their progress at a later stage of pregnancy. In a further 17 units (6.4%) the consultant selects the cases for delivery in the units but reviews only those with complications of pregnancy. In 15 units (5.6%) selection for delivery is made by general practitioners, but the consultant reviews all cases at least once during pregnancy. A consultant obstetrician thus sees *all* cases at some stages of pregnancy in 36.8% of units. In a further 54 units (20.3%) a consultant obstetrician visits the unit antenatal clinic to see complicated cases selected by the general practitioner. In the remaining 114 units (42.9%) no special arrangements exist between consultants and general practitioners for contact in the antenatal period.

FIG. 2.—Distribution of self-contained G.P. units according to type of arrangements which exist for contact with a consultant obstetrician in the antenatal period.

Factors affecting consultant contact in the antenatal period:

(a) *Existence of Antenatal Clinics.*—The relation between the existence of antenatal clinics and the frequency of consultant contact in the antenatal period is shown in Table I. Of the 266 units 140 (52.6%) have antenatal clinics supervised by medical practitioners. (A further 22 units have antenatal or booking clinics supervised by midwives alone which have been excluded from this group.) In these a consultant sees all mothers for selection or review in 56 (40.0%) and visits to see complicated cases selected by the general practitioner in a further 54 (38.6%). Consultant contact during the antenatal period thus exists in 78.6% of units with antenatal clinics. In contrast, only 42 (33.3%) of the 126 units *without* clinics have formal arrangements whereby mothers visit a consultant clinic elsewhere for selection or review. The difference, which is significant at the 0.001 level, strongly suggests that the existence of antenatal clinics may be an important factor in determining whether or not units have close liaison with a consultant in the antenatal period. Moreover, the opportunity for personal contact between consultants and general practitioners should be much greater where consultants visit G.P. units than is the case where mothers attend a special consultant clinic elsewhere. However, it is notable that of the units with antenatal clinics 22 (15.7%) had clinics attended by a consultant only, and that in only 18 (12.9%) did all general practitioners using the unit also attend the antenatal clinics. Personal contact between consultant and general practitioner is therefore by no means certain even in the

units visited by a consultant. Nevertheless, the finding that only 52.6% of units have antenatal clinics is unsatisfactory.

TABLE I.—Relation Between Consultant Contact in the Antenatal Period and the Existence of Antenatal Clinics in Self-contained G.P. Maternity Units

Nature of Contact	Units with Antenatal Clinics		Units without Antenatal Clinics		All Units	
	No.	%	No.	%	No.	%
Consultant selects or reviews all cases for delivery in G.P. unit	56	40.0	42	33.3	98	36.8
Consultant visits antenatal clinic at G.P. unit to see complicated cases	54	38.6	—	—	54	20.3
No special arrangement for consultant to see cases	30	21.4	84	66.7	114	42.9
Total	140	100.0	126	100.0	266	100.0

(b) *Regional Differences.*—In Table II the hospital regions have been ranked according to the proportion of units with special arrangements for consultant contact in the antenatal period. Because of the small number of units in many regions categories 1–4 in Fig. 2 have been here grouped together. Consultant contact for antenatal care is seen to range from 82.3% for region A to 33.3% for region N. This considerable variation suggests that there may be important differences between the regions in policy regarding the relation between consultant obstetricians and general-practitioner maternity units.

TABLE II.—Proportion of Self-contained G.P. Maternity Units with Special Arrangement for Consultant Contact in the Antenatal Period in 14 Hospital Regions in England and Wales

Hospital Region	All Units	Units with Consultant Contact in Antenatal Period	
		No.	%
A	34	28	82.3
B	4	3	75.0
C	30	21	70.0
D	13	9	69.2
E	3	2	66.6
F	28	17	60.7
G	18	10	55.5
H	19	10	52.6
I	25	13	52.0
J	10	5	50.0
K	11	5	45.4
L	9	4	44.4
M	47	20	42.6
N	15	5	33.3
All regions	266	152	57.1

(c) *Distance from Nearest Consultant Unit.*—When the effect of the distance in miles from the nearest consultant unit on consultant contact in the antenatal period was examined it was found that there were no important differences between those units nearest a consultant unit and those most distant.

Consultant Contact During Labour

In addition to questions about the extent to which consultants are involved in antenatal supervision, an inquiry was made whether a consultant obstetrician (other than with the flying squad) visits the unit to see complicated cases during delivery (referred to as “contact during labour”). A positive answer to this question was given in 197 units (74.1%).

The extent to which consultant contact during labour and contact in the antenatal period are related is shown in Table III.

TABLE III.—Relation Between Consultant Contact in the Antenatal Period and for the Management of Complications of Delivery

	Consultant Contact in Antenatal Period	No Consultant Contact in Antenatal Period	All Units
Consultant visits to see complicated cases in labour	127 (64.5%)	70 (35.5%)	197 (100%)
Consultant does not visit to see complicated cases in labour	25 (36.2%)	44 (63.8%)	69 (100%)
All units	152 (57.1%)	114 (42.9%)	266 (100%)

Special arrangements for consultant contact in the antenatal period exist at 127 (64.5%) of the units where a consultant visits to see complicated cases in labour, but in only 25 (36.2%) of the units where such visits are not made. This difference, which is highly significant ($\chi^2=12.77$; d.f.=1; $P<0.001$), indicates that consultant contact during labour and contact in the antenatal period are closely related.

The effect of distance on consultant contact during labour is shown in Fig. 3. It is seen that consultant contact decreases from 80.09% when units are less than five miles (8 km.) from the consultant unit to 52.9% when over 15 miles (24 km.) distant. In contrast to contact between consultant and G.P. units for antenatal care it is thus seen that consultants visit less often to see complicated cases during labour as the distance

FIG. 3.—Proportion of self-contained G.P. maternity units with consultant contact during labour according to distance in miles from the nearest consultant unit.

increases. This finding, which is statistically significant ($\chi^2=9.44$; d.f.=3; $0.05>P>0.02$), emphasizes the importance of correct selection of mothers for delivery in those units most distant from a consultant unit.

Equipment and Facilities for Management of Obstetric Emergencies

General Anaesthesia

A detailed inquiry was made about anaesthetic equipment. The actual value of such equipment obviously depends on all items required for a particular technique being available. A points score for anaesthetic facilities has therefore been constructed with the advice of a consultant anaesthetist which takes into account both the functional effectiveness of the equipment and the quality of the anaesthesia that could be administered. With regard to the latter, the advice that we received stressed the fact that, while mothers were in general young and healthy, the mechanical problems of pregnancy may make the administration of anaesthetics particularly difficult. Ideally they should only be undertaken when the following facilities are available: (a) adequate suction; (b) a table (or bed) which can be tilted to the head-down position; and (c) equipment for intubation and controlled ventilation.

Of the above, mechanical suction is virtually mandatory, but provided this is available general anaesthesia may be given in emergencies with either an anaesthetic machine and face-mask or an open anaesthetic mask. Following these principles points were allotted as follows:

Equipment	Points
(1) Mechanical suction	2
(2) Complete equipment for intubation anaesthesia (including laryngoscope, endotracheal tubes, rubber face-mask, bag and connexions, anaesthetic machine)	2
(3) Access to operating-theatre* (or operating-table)	1
(4) Anaesthetic machine plus rubber face-mask, bag and connexions, or open anaesthetic mask	1

* This question was intended to identify units where patients could be tilted to the head-down position. Unfortunately it does not take into account units with obstetric beds which can be tilted head down. Units with such beds may thus be underscored in this respect.

The total points score possible is five. Examples of possible scores are as follows:

Equipment	Score
Intubation anaesthesia, suction, tilting table	5
Intubation anaesthesia and suction, or simple machine anaesthesia (or open anaesthesia) plus suction and tilting table	4
Simple machine anaesthesia (or open anaesthesia) plus suction	3
Simple machine anaesthesia (or open) plus tilting table	2
Simple machine anaesthesia (or open) alone	1

It will be noted that units with a score of less than 3 do not possess suction equipment. Their equipment is therefore inadequate for safe anaesthesia. A score of 3 indicates minimal facilities for safe anaesthesia, a score of 4 indicates good facilities, while 5 indicates optimum facilities. The distribution of anaesthetic facilities classified in this way is as shown in Table IV. In 57 of the units (21.4%) no adequate facilities for general anaesthesia were available.

TABLE IV.—Distribution of Anaesthetic Scores for Self-contained G.P. Maternity Units

Anaesthetic Facilities	Score	No. of Units	% of Units
Inadequate	0-2 points	57	21.4
Minimal	3	39	14.7
Good	4	90	33.8
Optimal	5	80	30.1
All		266	100.0

When anaesthetic scores were examined according to whether or not units had contact with a consultant for intrapartum complications (Fig. 4) it was found that in units with consultant contact the facilities were inadequate or minimal in 30.1% of units and good or ideal in 69.9%. In units without contact the facilities were inadequate or minimal in 52.2% (for the differences in anaesthetic facilities $\chi^2=9.73$; d.f.=1; $0.01>P>0.001$). Similar but less marked differences in anaesthetic facilities were observed according to whether or not units had consultant contact for antenatal care.

FIG. 4.—Distribution of anaesthetic facilities scores for self-contained G.P. units with and without consultant contact during labour.

Care of Newborn

Several questions relating to the care of the newborn were asked in the inquiry. These included questions about nursery facilities, visits from consultant paediatricians, and equipment for the resuscitation of the newborn. In this paper, however, attention is confined to equipment for resuscitation of the newborn, which was thought to be the most important aspect of this part of the inquiry.

The general introduction of intubation and controlled respiration for the resuscitation of anoxic babies has been in

important advance in the care of the newborn (Hodges *et al.*, 1960; Barrie, 1963). Moreover, as both the technique and equipment required are simple, it should be possible for this method of resuscitation to be used in G.P. units should the occasion arise.

Units were considered to have equipment for intubation of the newborn when both infant endotracheal tubes and a laryngoscope were available (whether infant or adult). This equipment was not available in 34.0% of units. When assessed in relation to contact with consultant obstetricians it was found that equipment for intubating the newborn was present in 71.4% of units with contact during labour, but in only 52.2% of those without contact ($\chi^2=6.49$; d.f.=1; $0.02>P>0.01$).

Access to Operating-theatres

A total of 106 units (39.8%) were stated to have access to an operating-theatre. The proportion of such units visited by a consultant to see complicated cases during labour, 78.3%, was slightly greater than those without access to an operating-theatre, 71.8%, but this difference is not statistically significant.

Obstetric Equipment

No relation was found between the possession by units of various items of obstetric equipment and visits by a consultant to see complicated cases during labour.

Discussion

The importance of a close working relation between G.P. maternity units and consultant obstetricians has been stressed by many authorities (Ministry of Health, 1959; Baird, 1960; R.C.O.G., 1962; Stallworthy, 1964; Stirling, 1963). That such arrangements are not only desirable but may also be harmonious has also been emphasized by general practitioners who have had first-hand experience of working in units with close consultant liaison (Jameson and Handfield-Jones, 1954; Stevenson, 1961; Stewart-Hess and Green, 1962). It is therefore surprising that in almost half (42.9%) of the self-contained G.P. units in England and Wales in 1966 there was no special arrangement for a consultant obstetrician to see during pregnancy mothers booked for delivery in the units. The absence of facilities to contact antenatal clinics appears to be one important factor underlying this finding; differences between regional hospital boards in policy regarding the relation between consultant obstetricians and G.P. maternity units may be another.

Under the hospital plan announced by the Ministry of Health (1962) it is envisaged that the majority of G.P. maternity beds will eventually be incorporated in district hospitals, where close co-operation between consultants and general practitioners should be the rule. However, in 1966 fewer than one in 30 G.P. units were physically integrated with a consultant unit, and it thus seems likely that it will be many years before this goal is achieved. It therefore seems important that in the meantime steps should be taken to ensure that all G.P. units have the facilities to conduct antenatal clinics, and that there should be a policy whereby these are visited regularly by a consultant obstetrician to see complicated cases and to advise on the selection of cases suitable for delivery in the unit.

Another matter of policy raised by this survey is the quality of equipment and facilities required in G.P. units for dealing with obstetric and paediatric emergencies. There can be little argument that all units should contain efficient equipment for resuscitation of the newborn, but in the matter of anaesthetic

and obstetric equipment the issues are less clear. Many authorities may feel that G.P. maternity units have no need of sophisticated equipment, as emergencies are now efficiently and safely dealt with by transfer to a consultant clinic. On the other hand, the delays involved in transferring such cases may in some instances make this course impracticable or more hazardous. Local circumstances rather than a general rule should therefore direct what is desirable in the type of anaesthetic and obstetric equipment in G.P. units. It is nevertheless of considerable interest that the quality of equipment is related to whether or not a consultant visits the unit to see complicated cases in labour.

Summary and Conclusions

This paper reports the results of a national postal survey of general-practitioner maternity units, involving 274 (95%) of the 288 units to whom the questionnaire was sent. The following are the main findings:

(1) About one in 20 (4.7%) of the units are integrated with or in close proximity to consultant units. Almost half (43.8%) are situated more than 10 miles (16 km.) from such units. As transfer of obstetric emergencies from such units is likely to involve considerable delay, selection of low-risk mothers for delivery there is of obvious importance.

(2) When the degree of contact between the units and consultant obstetricians was examined it was found that in almost half (42.9%) there was no formal arrangement for antenatal consultation with a consultant obstetrician. However, in nearly three-quarters of the units (74.1%) a consultant visited to see complicated cases during labour.

(3) The frequency of formal arrangements whereby a consultant sees cases antenatally was found to be associated with the existence of antenatal clinics. Three-quarters of the units with antenatal clinics had an arrangement, while one-third of units without clinics had no such arrangement.

(4) When the equipment of the units was studied it was found that about one in five (21.4%) did not have facilities to give an anaesthetic safely and one in three (34%) did not have equipment for intubating the newborn. The likelihood of possessing both types of equipment was associated significantly with an arrangement for a consultant to visit during labour.

(5) These findings suggest that in self-contained G.P. maternity units both formal arrangements for contact with a consultant obstetrician and the existence of antenatal clinics are highly desirable.

I wish to thank the senior administrative medical officers of the hospital regions in England and Wales for their permission to conduct this survey, the matrons and group secretaries of the units concerned for their co-operation in completing the questionnaires, Dr. D. C. Hodgson for his advice in constructing the anaesthetic equipment scores, and Dr. E. D. Acheson for his advice in the design of the survey and preparation of this paper.

REFERENCES

- Acheson, E. D., and Feldstein, M. S. (1964). *Brit. med. J.*, 2, 95.
- Baird, D. (1960). *Lancet*, 2, 557, 609.
- Barrie, H. (1963). *Ibid.*, 2, 1223.
- Hobbs, M. S. T., and Acheson, E. D. (1966a). *Brit. med. J.*, 1, 499.
- (1966b). *Lancet*, 1, 761.
- Hodges, R. J. H., Tunstall, M. E., Knight, R. F., and Wilson, E. J. (1960). *Brit. J. Anaesth.*, 32, 9.
- Jameson, J. E., and Handfield-Jones, R. P. C. (1954). *Lancet*, 1, 665.
- Ministry of Health (1959). *Report of the Maternity Services Committee*. H.M.S.O., London.
- (1962). *Hospital Plan for England and Wales*. H.M.S.O., London.
- Royal College of Obstetricians and Gynaecologists (1962). *Brit. med. J.*, 1, 391.
- Stallworthy, J. (1964). *Ibid.*, 2, 169.
- Stevenson, J. S. K. (1961). *Ibid.*, 1, 1673.
- Stewart-Hess, C. H., and Green, T. H. H. (1962). *Ibid.*, 2, 1115.
- Stirling, H. (1965). *Scot. med. J.*, 10, 371.