action of the ventricles may be less effective than normal. In simple pacing procedures ventricular contraction is dissociated from atrial contraction because only the ventricles are stimulated. Filling of the ventricles with blood may not be normal. Restoration of the normal heart sequence, with ventricular contraction occurring with a small delay after atrial contraction, would almost certainly increase the available cardiac output. This can be achieved by triggering off the ventricular stimulus, with a small delay, from the P wave of the E.C.G. This procedure has the additional advantage of allowing the paced ventricular rate of beating to be modified by the activity of the autonomic nervous system because the

beating of the normal sinu-atrial pacemaker is followed. Nevertheless, it may not be feasible to carry this out because the technical difficulties may not be compatible with day-to-day clinical practice.

This article is one of the Birmingham series of lectures (see B.M.J., 27 November, p. 510).

Further Reading

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General Practice Observed

Place of the General Practitioner in the Obstetric Service

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Summary

A survey of perinatal mortality in Northern Ireland has shown that despite a progressive fall in the proportion of deliveries at home the perinatal mortality rate in domiciliary practice has risen in recent years. Overall, however, the perinatal mortality rate for all deliveries compares well with English figures. It seems that as the proportion of deliveries in hospital and general-practitioner obstetric unit rises a hard core of high risk patients is left who insist on delivery at home. Three prerequisites for good general-practice obstetrics are careful selection of cases, intelligent antenatal care, and close co-operation between the general practitioner and the consultant.

Introduction

The role of the family doctor in the maternity services is at present being questioned. Can the family doctor maintain his position as an obstetrician, with the introduction of new techniques and the progressive development of midwifery?

The general-practitioner/obstetrician offers the advantages of continuity of care. This can be provided increasingly in general-practitioner maternity units—which, especially in country districts, are usually situated closer to the patient's home—than the larger district hospital. But does the standard of maternity services provided warrant the retention of the family doctor-obstetrician and has a general-practitioner maternity unit any real advantages over domiciliary confinement? This paper looks at these questions with particular reference to the maternity services in County Armagh, Northern Ireland.

Maternity Units in County Armagh

The main district hospital for County Armagh is the Lurgan and Portadown Hospital. This is a 30-bed specialist unit which during the period under review was staffed by one consultant obstetrician. It provides specialist cover for the Carleton General Practitioner Maternity Hospital, a 30-bed unit situated 6 miles (9.5 km) distant in Portadown. Daisy Hill Hospital is the other specialist hospital situated on the southern border of the country. A new general-practitioner unit has been opened in the City of Armagh but was not operational during the period under review. The number of births in the various units over the 10-year period 1960-9 and the dramatic fall in domiciliary confinements are shown in Table I.

TABLE I—Number of Births in Various Hospitals in County Armagh (1960-9)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Carleton ..	694	717	781	833	948	957	948	961	972	962
Lurgan ..	448	480	502	576	600	630	729	764	842	965
Domiciliary ..	934	832	760	754	697	596	463	374	274	187
Daisy Hill ..	462	457	494	483	618	589	635	655	577	600

The selection of patients for delivery at home or in the general-practitioner unit is entirely a matter for the individual general-practitioner/obstetrician. The matron of the unit books the patient on referral by her general practitioner and no criteria are laid down for the selection of cases. The consultant obstetrician does not see each patient routinely during the antenatal period but is readily available for advice if requested by the general-practitioner/obstetrician. Antenatal clinics are not held at the maternity unit. The general-practitioner/obstetrician does not usually send his antenatal notes to the unit when the patient is admitted. There has hitherto been no restriction on any general practitioner attending the unit, but recently an obstetric list has been introduced. The general practitioner is normally present at delivery and if not available always

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sends a deputy. The average stay for a patient in the unit is six days. The general-practitioner/obstetrician performs artificial rupture of membranes, low forceps deliveries, and ventouse extractions, mostly with local or regional anaesthetics. There is no consultant anaesthetic cover for the unit. Major procedures, including manual removal of the placenta, are performed by specialist staff in the unit or after transfer of the patient to the specialist maternity unit. Blood is not stored in the unit but full laboratory facilities are available at the district hospital.

Perinatal Mortality Rate

The adequacy of maternity care can be assessed by studying the perinatal mortality rate—that is, the number of stillbirths plus deaths in the first week per 1,000 total births—now believed to be a better index than the stillbirth rate.

As is shown in Table II the perinatal mortality rate fell steadily during 1961-9 both in Northern Ireland and in England and Wales.² Over this period the rate for England and Wales was lower than that for Northern Ireland. The perinatal mortality in County Armagh, though tending to fluctuate owing to the smaller numbers involved, was in the years 1965-9 lower than the average perinatal rate for Northern Ireland. During this five-year period County Armagh had a mean perinatal mortality rate of 29.5, which compares favourably with that of the other counties in the North of Ireland.² (Table III). In County Armagh over the same five-year period

TABLE II—Perinatal Mortality Rates for Northern Ireland, County Armagh, and England and Wales (1961-9)

	1961	1962	1963	1964	1965	1966	1967	1968	1969
Northern Ireland	38	38	36	35	35	31	31	29	29
County Armagh	45	33	45	31	35	26	32	22	31
England and Wales	32	31	29	28	27	26	25	25	23

TABLE III—Confinements and Perinatal Mortality Rates for Various Counties in Northern Ireland during 1965-9

	Mean Perinatal Mortality Rate 1965-9	Percentage of total Confinements Attended by G.P.s in 1969	Domiciliary Confinements in 1969 as % of Total
Co. Derry	29.1	35	4
Co. Antrim	29.2	58	2.5
Co. Armagh	29.5	39	6
Co. Fermanagh ..	30.8	42	7
Co. Tyrone	30.9	21	10
Co. Down	31.9	34	3
Belfast Co. Borough	35.0	25	5
Derry Co. Borough	37.0	22*	6

* Estimated.

the percentage of confinements attended by general practitioners continued to decline as it has done over the preceding five-year period. In 1961 in County Armagh 56.4% of confinements were attended by general practitioners, while in 1969 the percentage attendance was 38.5%.¹ This can be compared with the percentages in other counties during 1969³ (Table III).

When the perinatal mortality rates in the various counties are compared with the percentage confinements attended by general practitioners (Table III) there is no evidence of a higher perinatal mortality rate with a higher incidence of general-practitioner attendance at confinement. Neither can an association be shown between perinatal mortality rate and the percentage of social classes IV and V in each county or between perinatal mortality rate and population density. There are apt to be many other factors involved in these county variations. These findings are in keeping with the

1958 British Perinatal Mortality Survey,⁴ which showed that in England and Wales the eastern region had the lowest perinatal mortality ratio and the highest domiciliary delivery rate of any of the 11 regions and that apart from the London and south-eastern region the four regions which had the highest incidence of delivery in specialist hospitals also had the four highest perinatal mortality ratios.⁵

The unadjusted perinatal mortality rates for the years 1966-9 for Lurgan Hospital, the Carleton Maternity Home, and domiciliary practices are shown in Table IV. By the unadjusted perinatal rate is meant the number of perinatal deaths that actually occur in each unit or in domiciliary practice and not adjusted according to whether the patient was booked for that unit. The perinatal mortality rates adjusted for place of original confinement are shown in Table V. Some patients were transferred either in labour or after failed induction of

TABLE IV—Unadjusted Perinatal Mortality Rates by Place of Delivery 1966-9

	1966	1967	1968	1969
Lurgan	50.7	45.9	60.1	55.0
Carleton	10.5	9.3	7.2	7.3
Domiciliary ..	13.0	24.1	21.9	42.8

TABLE V—Perinatal Mortality Rates Adjusted for Place of Booking

	1966	1967	1968	1969
Lurgan	8.0	25.8	18.3	26.1
Carleton	25.2	17.6	16.4	23.7

labour from the Carleton Maternity Hospital to Lurgan Hospital in the years 1966-9. This gives a transfer rate of 10%. The transfer rate is the number of patients transferred as a percentage of the total deliveries in the unit.

Discussion

The perinatal mortality rate in domiciliary practice as shown in Table IV was relatively high and actually rose as the number of deliveries declined. This was probably due to the hard core of high-risk patients who refused hospital confinements and to the unmarried mothers, who do not attend in the antenatal period and are not booked for their confinements. It is at variance with previously published figures of Hobbs and Acheson⁶ and the British Perinatal Mortality Survey,⁴ both of which showed little variation in perinatal mortality rate between general-practitioner units and domiciliary practice. Apart from the particularly low perinatal mortality rate in Lurgan Hospital in 1966 the perinatal mortality rate was somewhat lower in the Carleton Maternity Hospital than Lurgan Hospital. These results were as expected and reflect the selection of bad-risk cases for the specialist hospital.

The published reports on obstetrics in general practice in the literature before 1960 were reviewed by O'Brien in 1963.⁷ The published reports from general-practitioner maternity units since then are summarized in Table VI. It is difficult to make comparisons for many reasons—(a) the perinatal mortality rate is continuing to improve gradually; (b) some reports do not adjust perinatal rates by place of booking; (c) some units, particularly combined general-practitioner and consultant units, have strict criteria for admissions. There is a resultant low overall percentage of general-practitioner confinements, often associated with a low attendance by the general-practitioner/obstetrician during labour and with a high transfer rate to consultant care in labour, with apparently better results.

TABLE VI—Review of Published Reports on General-practitioner Maternity Units

	Year	No of Deliveries	Unadjusted Rate	Adjusted Rate	Transfer Rate (%)
<i>General Practitioner Maternity Units</i>					
Brecon ⁸	1957-64	1,000		27	Nil
Oxford ⁶	1962	1,141	11	15	
Lanarkshire ¹⁵ { No. 1	1962-3	2,295	5.2		8
{ No. 2	1963-4	1,357	10.4		12.7
Spalding, Lincoln ¹⁶	1959-65	1,000	28		4.6
Carleton	1966-9	2,895	7.9	19.2	10.2
<i>Combined G.P./Consultant Units</i>					
Harlow ⁹	1966-8	1,540	3.0	19.1	13.3
Dulwich and St. Giles ¹⁰	1968	500		12.0	9.4
Belvedere, Glasgow ¹⁵	1962-4	1,024	10.7		10.7
Queen Mary, Sidcup ¹¹	1968	372		8.1	11

It is thus important when comparing results to consider the criteria for selection of patients, the percentage of actual confinements by the general-practitioner/obstetrician, and the transfer rate immediately before and during labour to the specialist unit. Cavenagh⁸ reported that the general-practitioner maternity unit in Brecon, South Wales, was then situated 40 miles (64 km) from the nearest specialist hospital. There were no transfers in labour, the caesarean sections being performed by the senior partner in the practice. Strict criteria for admissions were used at the Princess Alexandra Hospital, Harlow,⁹ where the consultant obstetrician was the booking officer. The perinatal mortality rates were very similar to those in the present study, where the general-practitioner/obstetrician had complete discretion in regard to admission to the unit (Table VI). Oldershaw and Brudenell¹⁰ described how in Dulwich and St. Giles' Hospitals the patients were admitted under the care of the consultant obstetrician, the general practitioner working under his direction. Patients were reviewed by the consultant obstetrician at the 34th week. There was close co-operation between consultant and general-practitioner/obstetrician, as shown by a 9.4% transfer rate and a 6.4% consultation rate in labour. The perinatal mortality rate was 12.0. Barnard¹¹ reported on a similar scheme at Queen Mary's Hospital, Sidcup, with the even lower perinatal mortality of 8.1.

Conclusions

There appear to be three essential prerequisites for good general-practice obstetrics—careful selection of cases, intelligent antenatal care, and close co-operation between general practitioner and consultant. Careful selection of cases for the general-practitioner maternity unit is vital to the reduction in perinatal mortality. The question is how rigid and how strict the selection of cases should be and by whom selection should be made. The Royal College of Obstetricians and Gynaecologists¹² has made specific recommendations. Others favour even stricter criteria for admission to general-practitioner units. Many authorities¹³ favour selection of cases by the consultant obstetrician in early pregnancy rather than leaving the decision to the discretion of the general-practitioner/obstetrician.

Hobbs and Acheson⁶ found that the perinatal mortality in the Oxford area in 1962 was significantly higher in practices with access to general-practitioner maternity units than in practices without such access. They concluded that general-practitioner maternity units were being used as an alternative to consultant care and not just an alternative to domiciliary care. Their findings support this view, though it would be interesting to know if the increasing experience in the selection

of cases for general practitioner maternity units this still pertains. But is there value in a too rigid and strict selection of cases? Different units with varying criteria and methods of selection can have similar results. This paper and the British Perinatal Mortality Survey show that low perinatal mortality rates are not synonymous with a high percentage of specialist hospital confinements or conversely with a low percentage of general-practitioner confinements.

As Cookson⁵ stated, a careful selection of low-risk cases at the time of booking does not significantly reduce the proportion requiring transfer or lead to a low perinatal mortality rate in transferred cases. This is because some of the major causes of perinatal mortality—for instance, premature labour and toxæmia—are not predictable at the time of selection. Thus intelligent antenatal care is essential to the practice of good general-practitioner obstetrics. The general-practitioner/obstetrician must be able to recognize the abnormal—the early warning signs of trouble ahead—and take appropriate action. Intelligent antenatal care must also include a follow-up of the non-attenders, who carry such a high risk.

The third and final essential in general-practice obstetrics is that there should be close co-operation between general practitioner and consultant obstetrician. Hobbs and Acheson,¹⁴ in a survey of general-practitioner units in England and Wales, found an association between the existence of antenatal clinics at general-practitioner maternity units and consultant contact during the antenatal period. They regarded it as unsatisfactory that only 53% of general-practitioner maternity units had antenatal clinics. The present study suggests that routine antenatal clinics are not a necessity in general-practitioner maternity units if as in County Armagh the consultant can attend the maternity unit or health centre regularly to see selected patients. Combined consultant and general-practitioner maternity units as shown in Table VI appear to have a lower perinatal mortality rate than separate general/practitioner units. Perhaps this is due to closer contact and co-operation that should exist between the general practitioner and the consultant in these units.

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