to the frequency of sepsis in these cases. As a matter of fact they seldom would, for as a rule they have not been booked so early in pregnancy, but there is some danger that the midwife might be called in by a doctor. The district nurse is obviously the right person, and there appears to be no reason why she should not be used.

The District Nurse-Midwife

Rural areas are frequently served by a district nurse-midwife. This is, in my opinion, a bad practice, and is no longer needed, with the sufficient use of motor cars and telephones. Where distances are too great for this, it is surely the duty of the local authority to provide institutional care and a home-help service. Rural local authorities are too often content to throw up their hands and talk only of the difficulties of long distances, meanwhile making no effort to meet them. There is also a great tendency to say countrywomen will not accept this and that, when they are given no chance to say they will. As a matter of fact the patience and long-suffering of the rural population are wonderful, but are wearing rather thin.

Provision for Emergency Cases

The situation in a maternity institution admitting emergencies is often very difficult, and there is undoubtedly a higher sepsis rate in such institutions than there would be if the accommodation was of a higher standard.

Separate delivery rooms and separate wards, with ample single-room isolation, are essential for satisfactory work with emergencies, but are seldom or never available. Frequently the institution tries to do more than it has accommodation for and so lowers the general standard. No maternity institution, moreover, can afford to be without isolation rooms for the potentially septic cases, and these should be provided even where arrangements are made for the immediate removal of every case of notifiable pyrexia.

Conclusion

I would like to emphasize that the prevention of puerperal sepsis depends on intensive and intelligent antenatal care, with precautions directed towards safeguarding the patient from infection carried by the attendants, both during and after delivery. The greatest danger lies in the patient being infected through the attendant's own failure in health, and the best safeguard is the building-up of the patient's resistance by proper nutrition and the early and efficient treatment of all toxic or debilitating conditions, as well as by intelligent anticipation and treatment of obstetric abnormalities. At the same time the most stringent precautions should be taken in relation to asepsis, dust infection, etc., since all the ordinary risks of wound infection are constantly present.

The results of a careful technique show that institutional care can be rendered free from risks other than those inseparable from midwifery. The situation is very different where proper care is not exercised.

I should like to add a plea for closer co-operation with the public health authorities on the part of general practitioners. Notification of puerperal pyrexia is not a meaningless formality; it helps to ensure efficient supervision of midwives and gives information of the utmost interest in assessing the value of various precautionary and preventive measures.

The present statistics of puerperal pyrexia are valueless for district practice: they are fallacious, since a very large number of cases are never notified.

THE PREVENTION AND CONTROL OF PUERPERAL SEPSIS : ADMINISTRATIVE ASPECTS*

BY

A. MASSEY, M.D., D.P.H.

Medical Officer of Health, City of Coventry

Extent and Nature of the Problem

The Report on an Investigation into Maternal Mortality published by the Ministry of Health last year contains interesting figures relating to the role of sepsis in the causation of puerperal mortality. In this connexion, for example, it is shown that in a series of 770 maternal deaths investigated in selected areas puerperal sepsis was deemed to have been the cause in no less than 39 per cent. of cases. In the country generally it appears that 30 per cent. to 40 per cent. of all maternal deaths are attributable to sepsis. For the year 1937 in England and Wales the maternal mortality rate was 3.11 per 1,000 total births, the rate for puerperal sepsis being 0.94. Although figures relating to maternal morbidity are not available, it is safe to assume that sepsis is similarly a dominant factor in causation.

Maternal Mortality for the Year 1937 in Certain Towns

Town	Maternal Mortality per 1,000 Total Births	From Sepsis	From Other Causes
Barrow-in-Furness	4.90	0.98	3.92
Bolton	6.10	0.87	5.23
Bootle	3.66	1.83	1.83
Bournemouth	2.85	0.71	2.14
Bristol	3.53	1.12	2.41
Coventry	3.06	0.30	2.76
Darlington	1.68	0.84	0.84
Derby	4.66	1.39	3.27
Dundee	5.12	1.92	3.20
Eastbourne	4.69	1.56	3.13
Edinburgh	4.55	1.17	3.38
Liverpool	2.31	0.58	1.73
Middlesbrough	4.59	1.77	2.82
Stoke-on-Trent	4.59	0.84	3.75
Sunderland	3.45	1.06	2.39
Walsall	4.04	2.02	2.02

These considerations underline at the outset the first importance of measures directed to the prevention and control of puerperal sepsis. It must be confessed, however, that hitherto these measures have been attended with but limited success. It is notorious that, in contrast with a spectacular reduction in infantile mortality, little or no impression has been made upon the maternal mortality rate. Maternal deaths due to sepsis have in fact increased to some extent in recent years. The measures of social, economic, and environmental amelioration that have lowered the infantile death rate in so marked a fashion have hitherto proved of much less avail against maternal mortality. Some investigators, indeed, have adduced findings to indicate that the incidence of puerperal sepsis actually tends to increase on ascent of the social

* Read in opening a discussion at a joint meeting of the Sections of Public Health and Hygiene, and Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association, Plymouth, 1938.

scale. But there are many complex factors here at work, such as, to take a single example, the larger proportion of first confinements among the more well-to-do classes.

Improved standards of general midwifery practice are admitted to constitute the basis of measures for the prevention and control of puerperal sepsis. To attain these standards is not entirely a matter of obstetrics but partly also a matter of administration. The administrator can do much to raise the standard of skill and method in midwives' practice, and to improve the conditions under which obstetricians and midwives work and also the human material with which they have to deal. To the administrator also falls the task of evolving policy, notably, for example, in connexion with the relative claims of institutional and domiciliary midwifery, with the conduct of ante-natal centres, with the enforcement of notification of puerperal pyrexia, and like matters. Then again—and this is all-important—he is concerned with the education of public opinion on behalf of maternal welfare. I will deal briefly with some of these points.

Standard of Midwives' Practice

Although the proportion of confinements attended by doctors and midwives respectively varies somewhat widely area by area, it is probable that in the country as a whole some 70 per cent. are attended by midwives alone. In accordance with the modern trend of thought, moreover, it is likely that a still larger proportion of normal confinements will be undertaken by midwives in future. Thus it is that in the prevention of puerperal sepsis no measure is more important than that of raising the standard of midwives' practice. This at once indicates the supreme rationale of the Midwives Act, 1936, which has for its primary objects the improved education and status of midwives, the elimination of unsuitable persons from midwifery practice, and the competent control and supervision of midwives remaining in public or private practice.

The schemes of full-time salaried midwives for domiciliary practice, now being operated under the 1936 Act by local authorities or by approved voluntary associations under the surveillance of local authorities, have attracted to their service the best of available personnel in the various localities. Increasing numbers of residual private practising midwives are capitulating to the lure of compensation as offered them by the Act and under the stress of decreasing practice due to the competition of official services. This in time will tend to produce a better type of midwife, under improved control, and should devolve advantageously in the combat with puerperal sepsis. Administratively the full-time salaried midwife has many advantages relevant to the present theme. Important among these is the fact that, unlike her colleague in private practice, she has no financial inducement to avoid suspension from duty following contact with infection.

An interdiction by local authorities and voluntary associations concerned, in respect of the continuation in their service of midwives after marriage, may well be a necessary measure against puerperal sepsis, for when she has young children of her own, with their liability to scarlet fever, otitis, sore throat, and the like, the married midwife is more than ordinarily liable to convey infection. This does not, of course, apply to midwives of middle age, or beyond, who were already long married when initially admitted to the service.

The Part of the General Practitioner

The increasing tendency for normal confinements to be conducted by midwives restricts the experience in this branch available to medical practitioners, who are never-

theless expected to be equal to all emergencies to which they are summoned by midwives. In this connexion it is of course recognized that unskilled or untimely interference is a common cause of puerperal sepsis. These and similar considerations have led to the advocacy in some quarters of panels, limited to doctors with special experience in midwifery, for dealing with midwives' emergency cases instead of the present system whereby all medical practitioners are eligible for the work.

Notification by medical practitioners of cases of infectious disease is recognized as a necessary condition of control. This applies to puerperal pyrexia no less than to other infectious diseases, and yet in many areas the notifications of puerperal pyrexia are notoriously incomplete. As a result of the Public Health Act, 1936, the procedure in regard to the notification of puerperal febrile conditions has been simplified. Formerly, for purposes of notification, it was necessary to categorize these conditions into either puerperal fever or puerperal pyrexia. The effect of the new legislation is that the previous administrative differentiation between puerperal fever and puerperal pyrexia is removed, and all puerperal febrile states are notifiable as puerperal pyrexia. A more complete system of notification of this condition by medical practitioners is a necessary and ready line of reform in connexion with the control of sepsis.

Institutional v. Domiciliary Midwifery

In recent years there has been a progressive increase in the hospitalization of maternity cases. The Midwives Act, 1936, may now serve in some degree to check this tendency, for one of its objects appears to be that of restoring domiciliary confinements to greater favour. This has a bearing upon the prevention and control of sepsis, although it is difficult to define or assess. In most areas the increasing public demand for institutional confinements has overtaxed available beds, and either an overcrowding of cases or a diminution of the routine length of stay in hospital has resulted. In this way the risks of puerperal sepsis have been increased. Thus it appears that a necessary measure is either substantially to increase maternity bed accommodation or to limit admissions. The latter may well be the right as well as the readier line to take, notably in view of the improved domiciliary midwifery services already available as a result of the 1936 Act.

Cases for institutional maternity beds might usefully be restricted to (a) those showing abnormality as revealed at ante-natal investigation, (b) primiparae, and (c) cases from unsatisfactory homes. Thus the maternity hospital would deal largely with such types of case as constitute the worst "risk" in connexion with the possible supervision of puerperal sepsis. Then, again, the admission of emergency cases of potential sepsis has to be considered.

These things indicate that the careful planning of accommodation in maternity hospitals and in maternity units attached to general hospitals is a measure of fundamental importance in the prevention and control of puerperal sepsis. For this purpose separate isolation blocks are desirable for the accommodation of (a) cases of sepsis occurring in the routine practice of the hospital or unit, and (b) emergency admissions of actual or possible sepsis. In too many maternity hospitals or units the lay-out of accommodation is such that difficulty arises in circumscribing infection. Nowadays it may well be more important to have ample isolation accommodation for cases of puerperal sepsis than to have small-pox hospitals.

With regard to the hazard of puerperal sepsis there is some division of views as to whether a maternity hospital

is better as a separate entity or as a unit attached to a general hospital. The latter gives greater economy of administration, and it is likely that any epidemiological risk that may attach to the arrangement as such can be obviated by proper planning of the unit and by careful internal administration of the hospital.

Laboratory Facilities

In controlling puerperal sepsis a combination of epidemiological and bacteriological investigation is usually necessary, as, for example, in the determination of carriers and other agencies of infection. It should be just as much a matter of routine practice systematically to investigate an occurrence of puerperal sepsis as it already is in the case of the other major infections. Appropriate administrative action—in connexion with maternity hospitals, in the suspension of midwives from duty, and like matters—depends very often upon bacteriological findings. From the administrative point of view, therefore, adequate laboratory facilities are of obvious importance, and should be made available wherever possible in each area. In regard to laboratory services in general, there is useful scope in many districts in the matter of joint laboratory schemes conducted by the local authority and the local voluntary hospital in partnership.

Nutrition of Expectant Mothers

In the attempt to promote in expectant mothers a resistance to infection attention to the nutritional state is clearly of importance. For this purpose general powers for the "care" of mothers are contained in Section 204 of the 1936 Public Health Act. This section replaces that part of the 1918 Maternity and Child Welfare Act which dealt with the promotion of maternal "health." It appears that the word "care" now introduced is capable of the widest interpretation. Most or all maternity and child welfare authorities include in their schemes arrangements for the supply to expectant mothers of liquid milk or dried milk at cost, part-cost, or free, according to the ascertained means in each case. In a few areas the schemes also embrace "milk meals" or dinners for necessitous cases. The "milk meal" consists of milk and bread-and-butter, and is usually served about 11 a.m. The "dinner" is a complete meal, produced usually in a municipal kitchen and served at midday. To ensure that the expectant mothers themselves actually receive the meals, the latter need to be served at prescribed centres under supervision. Such measures as these have relevance—indirect but important—in the general combat with puerperal sepsis.

Formation of Public Opinion

Public or private agencies working on behalf of maternal welfare cannot achieve the best results without the active co-operation of the individuals whom they seek to help. The expectant mother herself may often be the final arbiter on the question of whether or not her confinement is to escape contingencies. In order to induce her to seek adequate ante-natal care and to follow faithfully the advice she receives, popular education in these matters is necessary. This comes largely within the province of the health administrator, although the family practitioner can take a vital part as an educator within the limits of his practice.

Medico-legal Aspects

In connexion with puerperal sepsis it is important to say a word concerning the liabilities and responsibilities of those in administrative charge of maternity hospitals or

domiciliary midwifery services and of those in clinical charge of maternity cases. I shall be brief, however, because a later speaker is to deal with this matter specifically. The *Lindsey County Council v. Marshall* case, which was carried to an appeal in the House of Lords in 1936, threw much light on the subject, notably in so far as concerns responsibility for the conduct of maternity hospitals and concerning the respective liabilities of local authorities and their medical officers.

The present position appears to be that any medical practitioner—whether in public or private practice—performing clinical work in the conduct of maternity cases is personally liable for all that flows from his (or her) acts or omissions. On the other hand, where a medical officer is performing an administrative act or a ministerial act as required by some statute or order of a governing or employing authority, the latter would be the defendant or would be joined as a defendant. In short, it appears that the clinical practitioner stands alone in this matter, whereas the administrative medical officer has his employing body behind him. Despite the foregoing, however, there are borderline cases in this connexion which fully tax the legal judgment.

In the *Lindsey County Council v. Marshall* case the appeal of the local authority in question was dismissed, and the main grounds for the decision appear to have been that the focal point in the case was an administrative one—namely, that at the time the plaintiff was admitted to it the maternity home administered by the county council was not reasonably safe, by reason of the prior presence of a case of puerperal sepsis about which the plaintiff was not informed.

The responsibility of a local authority or other governing body in connexion with a maternity home appears to be to satisfy itself so far as possible as to (a) the suitability and safety of the accommodation provided, (b) the supply of proper food, (c) the adequacy of the equipment, and (d) the reasonable efficiency of the staff it employs. The last two points also apply in the case of a domiciliary service of midwives.

Conclusion

The part prescribed for me in this discussion has relation to the administrative aspect only, and I trust that I have kept the bounds of my allotted sphere. The subject under consideration is complex and wide, and in respect of omissions I must plead the set limits of time and space.

The Minister of Health on July 26 opened a new general hospital at Louth, Lincolnshire. The hospital was formerly a Public Assistance institution, which has been converted by the erection of a large ward and alterations to the existing building at a cost of about £71,500. It has accommodation for 200 beds. "The public health hospitals should co-operate with, and not rival, the voluntary hospitals," said Dr. Elliot. "Indeed this principle of consultation is a statutory requirement of the Local Government Act of 1929." He described the great change that had come in the status of the old Poor Law hospitals with the passing of the Local Government Act of 1929, which empowered local councils to "appropriate" individual institutions to the public health services. This process expunged the so-called stigma of the Poor Law and set up a new hospital service of great national importance. He noted with approval that in the Lindsey area of Lincolnshire a consultative committee had been set up representative of the voluntary hospitals and the county council, which did excellent work in co-ordinating the hospital services as a whole.