Contemporary Themes

Neonatal and "perinatal" mortality rates by birth weight

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Summary

Neonatal and "perinatal" mortality rates by birth weight were compared for Sheffield and for England and Wales. The fall in neonatal mortality rate for Sheffield infants weighing 2500 g or less was partly due to the excessive fall in numbers in the 1000 g or less group: this effect was also present in England and Wales but was less pronounced.

Perinatal mortality rates may be lowered either by reducing (a) the number of stillbirths, (b) the number of preterm live births, or (c) by salvaging a greater percentage of the latter. For liveborn births it is suggested that the second approach would be better than the third. So far there is no evidence that superintensive care for those weighing 1000 g or less reduces their mortality rate.

Introduction

Previous studies[1 2] have shown that since 1967 the number of very light liveborn infants has fallen dramatically in one Sheffield hospital and in Sheffield itself, and that in England and Wales there has been a similar but less pronounced trend since 1964. In both the fall was disproportionate to that of total live births and of larger small births (2000 to 2500 g), being obvious mainly in the 1000 g or less group. This disproportionate fall in the number of high-risk infants may have played a part in the falling neonatal mortality rate. This report explores this possibility further.

Material

All figures were obtained from official DHSS publications[3 4] and the Sheffield Office of Population, Censuses, and Statistics. The figures for neonatal mortality are those of first-28-day deaths, since they are the only ones published nationally that are related to birth weight. Similarly the "perinatal" mortality rate is the number of stillbirths and neonatal deaths (first 28 days) per 1000 total births. This is not the same as the official perinatal mortality rate varying by the number of deaths occurring from seven to 28 days.

Results

In a comparison of the neonatal mortality rate for Sheffield with that for England and Wales the figures for all weights run parallel

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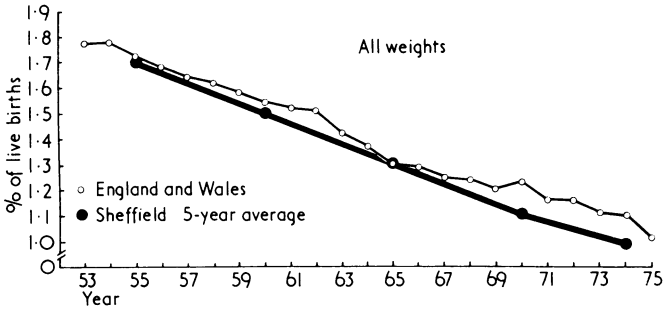

FIG 1—Neonatal mortality rates for first 28 days. Sheffield neonatal mortality rates (all weights) are always lower than in England and Wales.

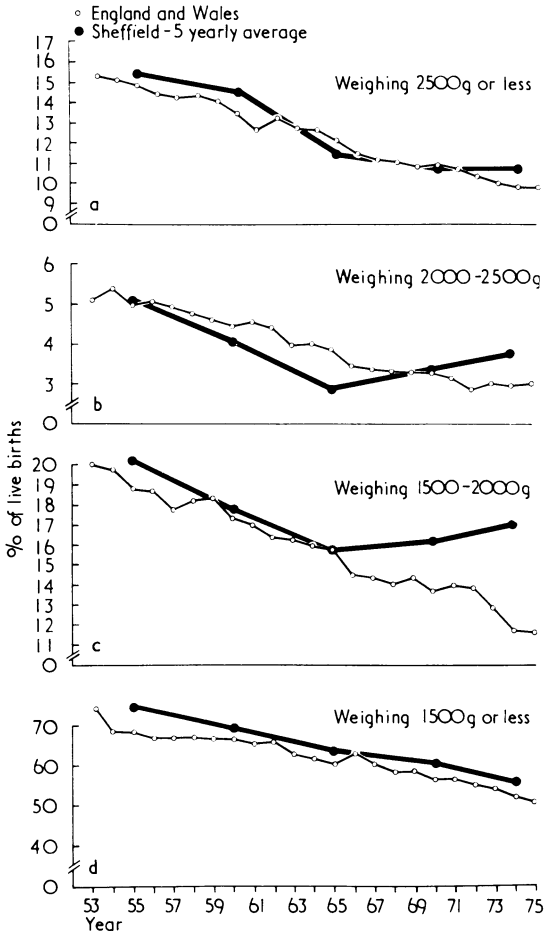

FIG 2a-d—Neonatal mortality rates for first 28 days. In smaller infants there is similarity in fall except for fig 2c where Sheffield mortality rate fails to continue to fall. This figure should be compared with fig 4c.

(fig 1). For those weighing 2500 g or less the Sheffield mortality was originally higher but for the past 15 years it has been much the same as the national figure (fig 2). Subgroups of the 2500 g or less group also show a similar trend, except that in the 2000-2500 g groups there has been a slight upward trend recently in Sheffield (fig 2b); the subgroup 1500-2000 g (fig 2c) shows a recent lack of fall in mortality in Sheffield; but the subgroup 1500 g or less follows the national trend. The conclusion from these figures might be that Sheffield has just as good (or bad) neonatal mortality figues as the rest of England and Wales except for the subgroup 1500-2000 g where great improvement could be expected.

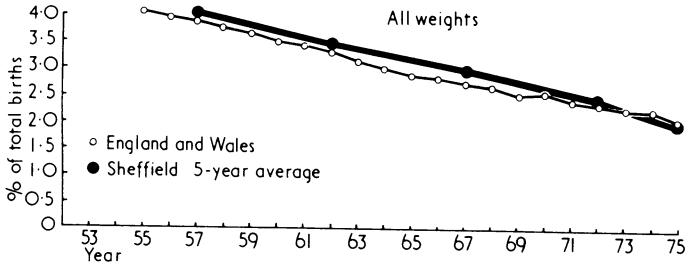

FIG 3—Perinatal mortality rates: stillbirths and first-28-day neonatal deaths. Similarity between perinatal mortality rates (all weights) is even more pronounced when single-year figures for Sheffield are plotted against national figures; this has not been published because other Sheffield figures show up better in five-year periods because of fluctuation of small numbers.

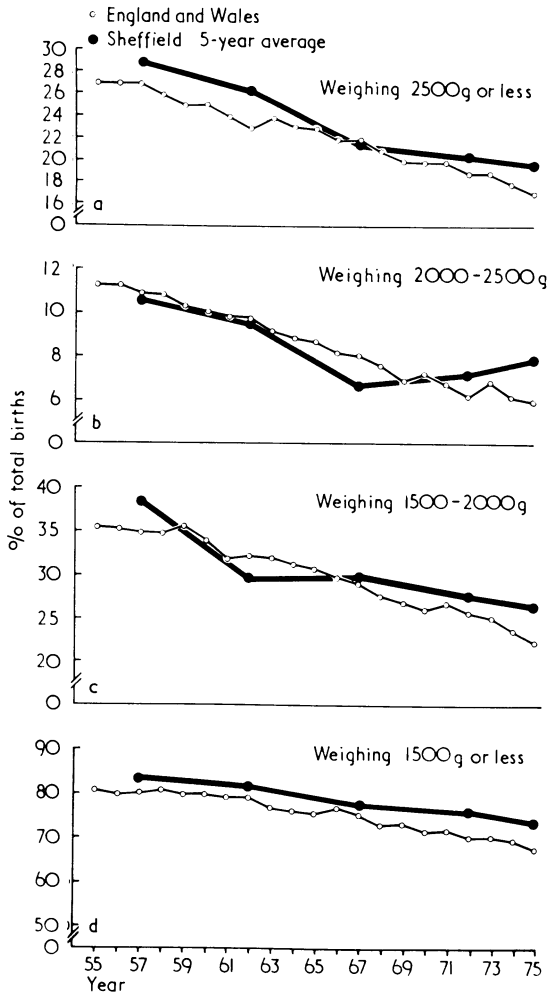

FIG 4a-d—Perinatal mortality rates: stillbirths and first-28-day neonatal deaths. Perinatal mortality rates are related to weight groups. Fig 4c should be compared with 2c since it shows that an apparently poor result in neonatal mortality may be balanced by a decreased number of stillbirths.

The perinatal mortality rates are also similar. For all weights the figures have been identical since 1955 (fig 3). Sheffield trends are similar but always slightly higher (fig 4a, b, and d). The Sheffield perinatal results (fig 4c) correspond better with those for England and Wales than did the neonatal mortality (fig 2c) for this weight group.

But has the fall in mortality rates been related to the dramatic fall in number of very small, high risk infants?[1] From 1964 to 1975 in England and Wales the mortality rate for the 2500 g or less group fell 2·92% (12·75-9·83% (see table). If the disproportionate fall in the 1000 g or less component had not occurred the mortality rate in 1975 would have been 10·19% instead of 9·83%. The disproportionate fall in numbers accounted for 0·36% of the 2·92% fall in mortality rate in England and Wales (12·33% of the fall).

England and Wales: effect of the disproportionate fall in live births weighing 1000 g or less on the neonatal mortality rate of those weighing 2500 g or less

	1964	1975	% Fall
	<2500 g		
Total live births	55852	38604	30·88
No of deaths	7119	3794	
% Mortality	12·75	9·83	2·92
	<1000 g		
Total live births	2358	1416	39·95*
No of deaths	1980	1095	
% Mortality	83·97	77·33	6·64

*Fall of only 30·88% would have meant 212 more live births with 163 (77%) deaths. Hence for 1975 total live births would have been 38816 (38604 + 212) and total deaths 3957 (3794 + 163)—proportion of deaths 10·19%. Difference between this proportion and that observed (9·83%) is 0·36%.

In Sheffield, however, the mortality rate in the 2500 g or less group in 1967 was 11·95%; in 1975 it was 8·19%—a fall of 3·76%. The percentage fall in 1000 g or less numbers was 66·66%.[2] By a similar calculation to that in the table, if the fall in numbers had been the same as in the 2500 g or less group as a whole (44·75%), the mortality rate in 1975 would have been 9·25%. Therefore the fall in numbers was responsible for 1·06% (9·25-8·19) of the 3·76% fall in the Sheffield mortality rate (28·2% of the fall).

Therefore the excessive fall in numbers in the 1000 g or less group has had a considerable effect on the mortality rate in the 2500 g or less group in Sheffield but a lesser effect in England and Wales. This is perhaps not surprising since the fall in numbers in Sheffield in the smallest weight group was much greater than in England and Wales.[2]

Discussion

It has been suggested that the fall in neonatal mortality rate in one maternity unit for infants weighing 2500 g or less was due more to a fall in the number of very small infants than to a specific improvement in survival rate in any of the subgroups.[1] A further report[2] showed a similar disproportionate fall in Sheffield and in England and Wales—much greater in the former. The present report shows that neonatal and perinatal mortality rates in Sheffield are similar to those in England and Wales, showing a steady fall since 1953 in most cases. In Sheffield a considerable amount (28·2%) of the fall in mortality rate in the 2500 g or less group was due to the large fall in numbers in the 1000 g or less group: this was less in the figures for England and Wales (12·3%). There are two ways of reducing neonatal mortality rates in lightweight live births—either by increasing the recovery rates or by reducing the numbers of the very small who are most at risk. Reduction of perinatal mortality also includes reduction in stillbirths.

Reduction of stillbirths—The national number of stillbirths has fallen continuously since 1955. It started during the period of rising births and has continued during the fall. Although affecting all weights it has been more pronounced in those over 2500 g and in the higher subgroup of those weighing 2500 g or less. Thus for stillbirths of all weights in England and Wales the fall in 1955-75 was 54·49%; for those weighing 2500 g or less it was 52·49%; and for those weighing 1500 g or less it was 49·26%. The improvement in the larger weight groups is

probably due to delivering quickly those who are in danger. This is not always the best answer in the smallest. With them also there is the constant difficulty of deciding whether a birth should be classified as still or live. The use of perinatal rates by birth weight would overcome this difficulty statistically if not clinically.

Salvaging of high-risk infants—The DHSS have recently suggested extending this concept and recommended the establishment of regional superintensive baby care units so that even the smallest of preterm infants can be given superintensive care. The objective is to reduce neonatal deaths and future handicap. The follow-up of the very small survivors of those units already in existence, however, suggests a handicap rate of 7-18%,[7] so that their exact position in relation to the overall reduction of handicap is being questioned.[7 8]

Prevention of spontaneous preterm delivery—Davies,[7] when pointing out that this was the obvious answer, noted that the prematurity for England and Wales was not falling. There has been a disproportionate fall in the number of very small (1000 g or less) live births, however, which has been followed in Sheffield by an actual fall in the prematurity rate from 7·30% to 5·96% from 1970 to 1975. It seems likely, therefore, that this may be about to occur also in England and Wales. With the fall in the total birth rate there should be adequate facilities to provide first-rate obstetric hygiene and antenatal care to the people who need it most. Spontaneous preterm delivery is one of the hazards of social classes IV and V, so it is towards them that the major effort must be made. It will also be necessary by education (and perhaps payments like the French[9]) to convince these social groups that the facilities are worth using to the full. Fortunately obstetric interest in the prevention of preterm delivery is already lively,[10-13] and it is to be hoped that this will increase.

Finally, since 1963 when figures for births of 1000 g or less were first recorded the neonatal mortality rate for this group in England and Wales has fallen from 85·12% to 77·3% with an average of 80·95% for the years 1966-75. For the same 10-year period infants of this weight group born and cared for in University College Hospital, London, showed an 80% mortality rate[6]—virtually the same as the national figure. It really still has to be proved that on a community basis superintensive care can improve survival rates.

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Declaration of Hawaii

Declaration adopted unanimously by the General Assembly of the World Psychiatric Association at the Sixth World Congress of Psychiatry, 1977

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Ever since the dawn of culture ethics has been an essential part of the healing art. Conflicting loyalties for physicians in contemporary society, the delicate nature of the therapist-patient relationship, and the possibility of abuses of psychiatric concepts, knowledge, and technology in actions contrary to the laws of humanity all make high ethical standards more necessary than ever for those practising the art and science of psychiatry.

As a practitioner of medicine and a member of society, the psychiatrist has to consider the ethical implications specific to psychiatry as well as the ethical demands on all physicians and the societal duties of every man and woman.

A keen conscience and personal judgment is essential for ethical behaviour. Nevertheless, to clarify the profession's ethical implications and to guide individual psychiatrists and help form their consciences, written rules are needed.

Therefore, the General Assembly of the World Psychiatric Association has laid down the following ethical guidelines for psychiatrists all over the world.

(1) The aim of psychiatry is to promote health and personal autonomy and growth. To the best of his or her ability, consistent with accepted scientific and ethical principles, the psychiatrist shall serve the best interests of the patient and be also concerned for the common good and a just allocation of health resources.

To fulfil these aims requires continuous research and continual education of health care personnel, patients, and the public.

(2) Every patient must be offered the best therapy available and be treated with the solicitude and respect due to the dignity of all human beings and to their autonomy over their own lives and health.

The psychiatrist is responsible for treatment given by the staff members and owes them qualified supervision and education. Whenever there is a need, or whenever a reasonable request is forthcoming from the patient, the psychiatrist should seek the help or the opinion of a more experienced colleague.

(3) A therapeutic relationship between patient and psychiatrist is founded on mutual agreement. It requires trust, confidentiality, openness, co-operation, and mutual responsibility. Such a relationship may not be possible to establish with some severely ill patients. In that case, as in the treatment of children, contact should be established with a person close to the patient and acceptable to him or her.

If and when a relationship is established for purposes other than therapeutic, such as in forensic psychiatry, its nature must be thoroughly explained to the person concerned.

(4) The psychiatrist should inform the patient of the nature of the condition, of the proposed diagnostic and therapeutic procedures, including possible alternatives, and of the prognosis. This information must be offered in a considerate way and the patient be given the opportunity to choose between appropriate and available methods.

(5) No procedure must be performed or treatment given against or independent of a patient's own will, unless the patient