Premature baby statistics

RONALD R GORDON

British Medical Journal, 1977, 1, 1313-1315

Summary

For 27 years annual figures have been kept of all infants weighing 2500 g or less born in the maternity department of the Northern General Hospital, Sheffield. The initial neonatal mortality rate (death within the first four weeks after birth) was then around 30% and is now 10%. This reduction is partly due to a decreased mortality rate among the individual weight groups but also to an increasing number of larger infants and a decreasing number of infants of low birth weight in the "high-risk" category.

Introduction

Since 1948 premature baby units (later special care baby units) supervised by paediatricians have been established in all maternity departments in the United Kingdom. At first, care consisted essentially of skilled nursing and minimal interference. From 1965 active and even intensive care has been practised because the immediate and late results were considered to be poor. Some units have developed intensive care to such a high degree of technical expertise that even the smallest and most immature of fetuses are now being given the chance to survive.¹

Recently a DHSS circular² and the Court report³ have suggested that, since some district hospitals do not have the staff or equipment to provide the ultimate in intensive care, special regional units should be set up in teaching centres to which all infants requiring intensive care could be sent. This would establish a kind of two-tier system. This suggestion has received both approval⁴ and disapproval.^{5,6} The thought behind the two-tier system was that the fall in infantile mortality rate in the United Kingdom was lagging behind that of other countries (notably France and Japan), and that this especially applied to the neonatal period. (The recent falls to 15.7 and 13.9 per 1000 live births in 1975 and 1976 are, however, happier.)

The Sheffield Northern General Hospital has always been a district hospital within an urban community. Although now a university hospital the catchment area is still that of the locality, especially in the case of the maternity department. In 1949 there was one consultant paediatrician but no junior paediatric staff. From 1965 there has been a full complement, comprising a senior registrar, registrar, and three senior house officers, so that intensive care has been practised to a level possible in any general hospital but not to the second-tier level. Since 1948 records have been kept at the end of each year of all infants born in the hospital with a birth weight of 2500 g or less and their neonatal mortality rate (deaths in first 28 days). Birthweights are grouped in four subdivisions—namely, 2001-2500 g, 1501-2000 g, 1001-1500 g, and 1000 g or less. About one-third of the infants are growth-retarded rather than truly preterm, but most of these are in the weight group 2001-2500 g. The highest mortality occurs mainly among infants in the smaller weight groups, and they are always preterm. The results obtained in the care of these small infants over a 27-year period form the basis of this report.

Results and comment

Figure 1 shows the percentage annual mortality in the first four weeks of life (neonatal mortality rate) in all infants born in the hospital with a birth weight of 2500 g or less. The larger infants were mainly nursed on the postnatal wards, only the smaller and iller ones being admitted to the special care baby unit (SCBU). In the early years the mortality rate was almost 30%, and it has now fallen gradually to about 10%. This would appear to be reasonably satisfactory, but when we come to look at the four individual weight groups (2001-2500 g, 1501-2000 g, 1001-1500 g, and 1000 g or less) this gradual fall is not represented (fig 1; table I). In all four weight groups there was an initial fall—probably because of the establishment of the SCBU—but since then the mortality rate has remained the same (the recent slight rise is probably artificial: due to smaller numbers). The overall drop in the mortality rate is therefore not entirely due to a drop in its component parts.

The total number of infants with a birth weight of 2500 g or less born in the hospital per annum is shown in figure 2. There was a gradual increase from 1948 to 1970, since when there has been a sudden drop that follows the pattern of the total number of infants of all weights born in the hospital and in Sheffield (figs 3, 4). The gradual increase up to 1970 reflects not only the increasing number of births in the city but also the move from home to hospital delivery which took place during that time.

FIG 1—Percentage annual neonatal mortality rate among all small (weight ≤ 2500 g) infants born in the Northern General Hospital, Sheffield.

TABLE 1—Neonatal mortality rates (%) for 1948-75 among all preterm infants born in the Northern General Hospital, Sheffield. Results expressed as proportions of infants

Year	Birth weight (g)				Total (‰) ≤2500g
	≤1000	1001-1500	1501-2000	2001-2500	
1948-52	90/94 (95.74%)	68/128 (53.13%)	43/228 (18.86%)	47/571 (8.23%)	248/1021 (24.29)
1953-57	116/126 (92.06%)	48/112 (42.86%)	31/241 (12.86%)	36/601 (5.99%)	231/1080 (21.39)
1958-62	114/127 (89.76%)	66/151 (43.71%)	38/301 (12.62%)	17/768 (2.21%)	235/1347 (17.45)
1963-67	79/86 (91.86%)	55/140 (39.29%)	37/304 (12.17%)	25/837 (2.99%)	196/1367 (14.34)
1968-72	45/49 (91.84%)	59/106 (55.66%)	40/292 (13.70%)	39/985 (3.96%)	183/1432 (12.78)
1973-75*	11/11 (100%)	14/29 (48.28%)	16/96 (16.67%)	11/390 (2.82%)	52/526 (9.89)

*Three-year period only.

FIG 2—Total annual number of infants weighing 2500 g or less born in the Northern General Hospital, Sheffield.

FIG 3—Total number of infants of all weights born in the Northern General Hospital, Sheffield.

Figure 2 shows that in the highest-weight group (2001-2500 g)—which is also the largest—the pattern is similar to that in the group as a whole. With diminishing weight the pattern alters so that the rise becomes less pronounced and the fall less abrupt. In the smallest-weight group (1000 g or less) there was only a slight initial rise followed by a sustained fall which started in 1962. In 1973, 1974, and 1975 there were only 1, 5, and 5 infants respectively in this smallest group, whereas at the peak there were about 30 per year.

The apparent drop in the overall mortality rate is therefore partly explained by a decreasing number of infants of low weight (high-risk). All infants have been included, even those with severe congenital malformations.

FIG 4—Total number of infants of all weights born to Sheffield residents.

Discussion

Our overall mortality rate shows a steady fall since 1948, which is satisfactory; we believe, however, that this is due to the decreasing number of infants in the high-risk category rather than to any improvement in survival rates among the different weight groups. Intensive care started in 1965 and we are naturally somewhat disappointed with the results. When we try to compare our figures with others we find it difficult to make a just comparison. The University College Hospital figures were published in 1971,⁷ and certainly seemed to be better than ours, but many of their infants were "imported," which introduces an element of selection. Nevertheless, with a presumably comparable population they seemed to improve their results in 1960-9 as compared with 1950-3 in the smallest-weight groups—but so did we. Recently the results from Oxford in 1973-4 were published but comparison is almost impossible since they exclude some that we do not and vice versa. All we can say is that their overall mortality rate for preterm babies was 79.3 per 1000 and ours for the same two years by weight was 94 per 1000. They say that a third of their perinatal deaths were excluded because of lethal abnormality, and if half of these were neonatal deaths this entails adding one-sixth to their mortality, which would make their rate 92 per 1000 live births, compared with our 94 per 1000 live births for the same two years.

We believe that our results represent what may be accomplished in a properly staffed district hospital rather than in a

second-tier superintensive care unit. We know results as good (or as bad) as ours are often obtained in well-established district hospital units, so their results may be as good as the best that is available at present. If we staff and equip our district hospitals properly, the necessity for second-tier units may disappear. There is a further argument for increasing the capability of the district unit since it has to cope with asphyxiated neonates; if they are equipped for them they should be equipped for the preterm infants also. This seems to us to be the all-important reason for upgrading those district neonatal units that require it.

But the last word, on this occasion, may be with the obstetricians. Our figures show that the number of very small infants being born is declining disproportionately to the fall in the birth rate. For instance, in 1970 before the birth rate in Sheffield started dropping dramatically there were 44 babies in our series under 1500 g and 214 weighing 2001-2500 g; in 1975 there were 16 and 124, respectively. This is a drop of 67.64% in the under 1500 g group compared with a drop of 42.06% in those weighing

2001-2500 g. It is not for a paediatrician to say how near the obstetricians are to controlling spontaneous premature labour, but interest in seeking the predisposing causes with a view to preventing spontaneous labour is already increasing.⁸⁻¹⁰

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(Accepted 15 March 1977)

Evoked potentials, saccadic velocities, and computerised tomography in diagnosis of multiple sclerosis

F L MASTAGLIA, J L BLACK, L A CALA, D W K COLLINS

British Medical Journal, 1977, **1**, 1315-1317

Summary

One hundred and two patients with suspected or established multiple sclerosis (MS) were investigated by one or more of the following techniques: measurement of visual evoked potentials (VEP); measurement of cervical and cortical somatosensory evoked potentials (SEP); measurement of horizontal saccadic eye movement velocities (SV); and computerised axial tomography of the cranium and orbits (CT). Each of the techniques was valuable in detecting abnormalities, some of which were subclinical, in many patients. More abnormalities were found in patients studied by more than one technique, the most being detected in patients who were studied by all five techniques. We conclude that the techniques have a complementary role in investigating suspected MS.

Introduction

The diagnosis of multiple sclerosis (MS) may be difficult to establish in patients who present with an initial episode of neurological dysfunction, with manifestations referable to only one site in the central nervous system (CNS), and in

patients with atypical presentations or few neurological signs.¹ Some electrophysiological techniques²⁻¹¹ have been found useful in confirming involvement of certain CNS pathways in such patients and, more importantly, in detecting subclinical lesions of these pathways, thereby indicating the existence of more than one lesion in the CNS. Moreover, demyelinating lesions in the brain,¹²⁻¹⁸ and possibly in the optic nerves,¹²⁻¹⁴ may be detected by computerised axial tomography of the cranium and orbits.

We have studied the relative and complementary value of measuring visual and somatosensory evoked potentials and saccadic eye movement velocities, and of computerised axial tomography of the cranium and orbits in a group of patients with established or suspected MS.

Patients and methods

We used the criteria of McDonald and Halliday¹⁹ to classify 102 unselected patients, 30 men and 72 women, aged 19-62 years into "clinically definite" (40), "early probable or latent" (30), and "suspected" (32) MS categories. The mean duration of the disease from onset of symptoms was 8.6 years in the first group, 4.4 years in the second group, and 11.4 months in the third group. Some of the techniques became available during the course of the study, so not all patients were studied by each technique.

Visual evoked potentials (VEPs) generated by pattern reversal were recorded from an active midline occipital electrode at Oz (10-20 system) and a reference electrode at Pz, during bilateral monocular stimulation in 102 patients.^{3 7 20} Responses were regarded as abnormal if the latency of the major surface-positive component exceeded 118 ms (normal mean +2.5 SD), or if there was a latency difference of greater than 6 ms between the two eyes, provided that other causes for delay such as uncorrected refractive errors and other ocular conditions had been excluded.

Somatosensory evoked potentials were recorded from active electrodes over the spinous process of the second cervical vertebra (cervical SEP), and over the hand area of the contralateral sensory cortex (cortical SEP) during separate stimulation of each median nerve at the wrist with two and a half to three times threshold electrical

University Department of Medicine and Departments of Biophysics and Radiology, Sir Charles Gairdner Hospital, Perth Medical Centre, Nedlands, Western Australia, 6009

F L MASTAGLIA, MD, FRACP, associate professor in neurology
J L BLACK, DPHIL, FAIP, head, department of biophysics
L A CALA, MRACR, FRCR, neuroradiologist
D W K COLLINS, MSC, MAIP, physicist