ORIGINAL ARTICLE

Social deprivation and admission for neonatal care

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Objective: To determine whether social deprivation is associated with neonatal unit admission.
Setting: English district general hospital.
Method: Retrospective review of neonatal unit admission records between 1990 and 2002.
Results: There was a linear increase in admission rates with increasing deprivation. The admission rate was 6.1% of live births for infants in the most affluent quartile compared with 11.1% for those in the most deprived quartile. Admission rates for all indications except jaundice and feeding problems increased with increasing deprivation.
Conclusion: Social deprivation correlates strongly with neonatal morbidity and the need for neonatal unit admission. This finding has implications for professionals in public health and primary and secondary care.

Social deprivation correlates positively with perinatal and neonatal mortality,[1 2] but whether it is associated with the broader spectrum of neonatal morbidity is not known. Deprivation is a risk factor for low birth weight,[1] and hence the need for neonatal intensive care, but little is known of its influence on the need for special and high dependency care. The objective of this study was to determine whether deprivation is associated with the need for admission to the neonatal unit in an English district general hospital.

METHODS

We examined the neonatal unit records at Wirral Hospital for the years 1990–2002 inclusive. Wirral has a population of about 380 000, and about 3300 deliveries per year. Less than 1% of the population is of ethnic minority origin. About 90% of the district's infants are born at Wirral Hospital. There is little cross boundary flow of patients to or from neighbouring units because of its location as a peninsula. The neonatal unit has no transitional care facility; phototherapy, nasogastric tube feeding, and blood glucose monitoring for infants with mild neonatal illness are performed on the postnatal wards, but those needing special or more intensive care are admitted to the neonatal unit. All infants born before 34 completed weeks gestation are admitted, whereas above this gestation there must be a specific reason, other than prematurity, for admission.

We documented admission numbers and, for each infant admitted, the gestational age, primary indication for admission, and the mother's postcode, from which we derived the Townsend deprivation index.[3] We compared frequency of admission in all quartiles of the deprivation index using the χ^2 test for linear trend.

Ethics committee approval was not needed as the study involved analysis of routinely collected data without examination of individual case records. No personal identifiers were collected along with the postcodes.

RESULTS

Of 47 614 live births, 4077 infants (8.6%) were admitted. There were no significant annual changes in admission rates or in numbers of very low birthweight infants. There was a linear increase in admission rate with increasing deprivation, from 6.1% of live births in the most affluent quartile to 11.1% in the most deprived quartile ($p<0.0001$, table 1).

Apart from jaundice and feeding problems, for all other indications the proportion of infants from each quartile needing admission increased significantly with increasing deprivation (table 1).

Table 1 Numbers of live births, numbers of admissions for all indications, and admission rate, by Townsend quartile

	Lower quartile	Mid-lower quartile	Mid-upper quartile	Upper quartile	p Value
Live births	11123	11432	12747	12312	
Prematurity	156	212	274	334	<0.0001
Respiratory distress	183	247	324	328	<0.0001
Delayed onset of respiration	72	69	97	115	0.004
Congenital anomalies	30	45	63	73	<0.0001
Hypoglycaemia	56	57	75	102	0.001
Jaundice	24	23	22	25	0.72
Infection	36	33	61	61	0.006
Feeding problems	25	21	44	35	0.10
Neonatal abstinence syndrome	1	16	34	76	<0.0001
Child protection/adoption	0	1	9	12	<0.0001
Miscellaneous	101	132	162	211	<0.0001
Total admissions	684	856	1165	1372	
Admission rate (%)	6.1	7.5	9.1	11.1	<0.0001

The lower quartile is the most affluent, and the upper quartile the most deprived. p Values were determined using the χ^2 test for linear trend.

What is already known on this topic

Social deprivation correlates positively with perinatal mortality and low birth weight.

What this study adds

Social deprivation also correlates positively with a wide range of neonatal morbidity.

COMMENT

We have shown that neonatal admission correlates positively with deprivation, the admission rate for babies from the most deprived quartile being almost twice that of the most affluent quartile. This association applied to almost all indications for admission. Although deprivation is associated with low birth weight[1] and congenital malformations,[4] its association with the wider spectrum of neonatal morbidity has not been described previously.

Could our findings reflect a lower professional threshold for admitting infants from poorer families? Such bias might be expected to apply to all indications for admission, and particularly to infants with feeding problems. As, however, there was no social gradient in admission for feeding problems, nor jaundice, the observed social gradient in other indications for admission is likely to be a genuine association and not to reflect selection bias.

The known association between deprivation, low birth weight, and congenital malformations could be mediated through periconceptional genetic, nutritional, or environmental factors. The association that we have shown between deprivation and other morbidity such as delayed onset of respiration, hypoglycaemia, and infection suggests a more pervasive influence of socially determined factors on placental function and fetal nutrition. Furthermore, respiratory distress, although a heterogeneous group including transient tachypnoea, minimal respiratory disease, meconium aspiration syndrome, and pneumonia, was strongly associated with deprivation. This therefore also correlates significantly with ''medical'' morbidity.

Our study cannot shed light on the mechanisms underlying the link between deprivation and neonatal morbidity. Factors may include poor maternal health and nutrition, access to and use of antenatal care, the effects of smoking, alcohol, and other drugs, psychosocial stress, and environmental factors.

We have shown previously that, in Wirral, the reduction in birth numbers in the past decade was significantly greater in the most affluent quartile of our population than in the poorest.[5] We have now shown that neonates from more deprived districts are significantly more likely to need admission than those from more affluent districts. This health inequality has implications for the families involved, for primary care and public health professionals, and for obstetric and paediatric services.

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