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The data never lies? A tertiary NICU's experience of responding to CQC alerts for raised neonatal mortality.

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Background

St Mary's Hospital Neonatal unit is a neonatal intensive care unit (NICU) which delivers both medical and surgical intensive care to a well-defined catchment area within Greater Manchester, with surgical care being delivered for the North West Operational Delivery Network. The NICU admits over 1000 babies per year and the delivery rate is approaching 10,000. The hospital trust was made aware of two alerts flagged by the Care Quality Commission (CQC) related to an apparent persistently raised perinatal mortality and late neonatal mortality rate from 2013/14, in particular, a sudden increase in January 2017 (8 deaths).

Results

Of the 24 babies 6 were transferred in from other neonatal intensive care units for on-going specialist care and there were 5 babies whose mothers resided outside the catchment area, but the babies were delivered at St Mary's for specialist service input or parental choice of place of delivery.

Causes of Death:

Extreme Prematurity and Extremely Low Birth Weight:

Gestation (weeks)	Weight (g)	Transfer	Co morbidty
22	417	N	
22	550	Y	
23	575	N	Candidal Septicaemia
23	695	N	Septicaemia
24	603	N	Septicaemia and Maternal Chorioamnionitis
24	745	Y	Intestinal Perforation
25	669	N	Pan enteric Necrotising Enterocolitis
25	731	N	Surfactant Deficient Lung Disease
25	810	Y	Pulmonary Haemorrhage and Intraventricular Haemorrhage
29	495	N	Hypotension

Congenital Abnormalities:

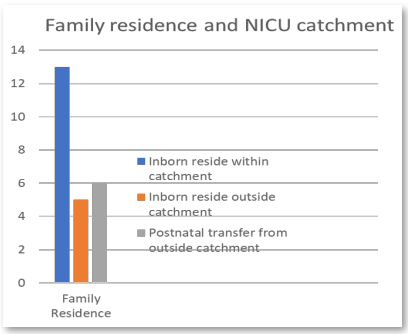
Gestation (weeks)	Weight (g)	Transfer	Diagnosis
37	2000	N	Hypoplastic Left Heart Syndrome (Inoperable)
27	1000	N	Sacrococcygeal Teratoma
36	3190	N	Congenital Cystic Adenoid Malformation of Lung, Pulmonary Hypoplasia, Pulmonary Hypertension.
31	2000	Y	Dilated Cardiomyopathy
37	3039	N	Thanotrophic Dysplasia type 1
38	2199	N	Mosaic Trisomy 22 with Inoperable Congenital Cardiac Defect
37	3220	N	Haemophagocytic Lymphohistiocytosis (HLH)
33	2355	N	Congenital Cystic Adenoid Malformation of Lung and Rasopathy
30	1098	N	Intrauterine Growth Restriction, Tracheoesophageal Fistula, Imperforate Anus.

HIE:

Gestation (weeks)	Weight (g)	Transfer
36	2800	Y
40	2370	Y
37	3380	N

Sepsis:

Gestation (weeks)	Weight (g)	Transfer	Diagnosis
27	1055	N	E. Coli septicaemia
34	2940	Y	Enteroviral Sepsis with Fulminant Liver Failure



Methods

A review of neonatal deaths was undertaken over a 7 month period between July 2016 and January 2017. There were 24 deaths in this time period that fell within the early and late neonatal death definitions and the review only included deaths of patients who died at St Mary's Hospital. All 24 deaths were reviewed 12 early and 12 late neonatal deaths. An exploration of significant factors involved in the mortalities was undertaken with learning outcomes and actions reviewed.

Conclusions

Whilst the data would suggest St Mary's Hospital appears to have had an increase in perinatal and late neonatal deaths, this is thought to be due to the use of the Summary Hospital-level Mortality Indicator (SHMI) and Hospital Episode Statistics (HES) data, as opposed to an actual increase. Unavoidable deaths and maternal factors that may influence cause of deaths are not taken into consideration, nor is the fact that many babies (46% in our cohort) are transferred in to specialist centres for care both antenatally and postnatally. At St Mary's the NICU is co-located with the Royal Manchester Children's Hospital and the NICU acts as a supra regional specialist centre with the provision of a well developed and large tertiary fetal medicine department. Furthermore, the perceived increase in deaths in January 2017 returned to a baseline rate of 4.7 per 1,000 (for April-July 2017), suggesting that this fluctuation was likely to be within limits of natural variation. Extreme prematurity and congenital abnormalities predictably were the most common causes of death with Hypoxic Ischaemic Encephalopathy and Septicaemia also contributing. All deaths had been reviewed at a local mortality review meeting in addition to a Network Mortality Review.

Future Work

Whilst it is of upmost importance to review our mortality data and strive to improve the quality of care we deliver, the review highlighted the problematic nature of using HES and SHMI (which is an adult tool) to analyse neonatal data in addition to the challenges of analysis of data in a large tertiary NICU.
A better means of analysing neonatal deaths should be explored.

References

Hospital Episode Statistics; hptts//digital.nhs.uk/data-and-information/data-tools-and-services/data services/hospital-episode-statistics

Summary Hospital-level Mortality Indicator (SHMI); hptts//digital.nhs.uk/data-and-information/publications/ci-hub/summary-hospital-level-mortality-indicator-shmi