We discussed that when babies who are born by caesarean section, as Child D was, they are more at risk from grunting which can be a sign of some fluid left on the lungs as the fluid is not expelled from the chest by the process of going through the birth canal. If there are no other concerning factors and a baby appears well but is only grunting slightly then often we will leave a baby and review them in the next 1-2 hours as grunting can often settle in the first few hours of life. However, in Child D's case there were risk factors for infection and she had had an apnoeic episode at 12 minutes of age. The risk factors for infection were as follows: you had prolonged rupture of membranes and your membranes had gone at a pre-term gestation, ie; less than 37 weeks. Taking these factors into account plus the grunting, there was a missed opportunity to intervene and take Child D round to the neonatal unit for further assessment at this point.

Child D was then reviewed at 3½ hours of age as you and the midwife continued to be concerned that she was grunting and was very quiet. At this point the junior doctor asked his middle grade doctor to review Child D as well and Child D was taken round to the neonatal unit. Her colour was noted to be poor and her oxygen saturations low. She had a cannula inserted and bloods taken for a septic screen and she received antibiotics just ahead of 4 hours of age. We then went on to discuss that Child D continued to receive antibiotics for the next 36 hours until the time her condition deteriorated significantly so it is unlikely that giving Child D antibiotics earlier would have altered the outcome.

It is however important that risk factors for infection are recognised as soon as possible and babies treated appropriately. We do have a departmental guideline in place based on the NICE Guidance for Neonatal Sepsis, of which our staff are aware and given training on at induction. We discussed the missed opportunity to bring Child D round to our neonatal unit earlier at our mortality and morbidity meeting and will ensure that it is emphasised to all staff within the department the importance of this guideline and ensure everyone is familiar with risk factors for infection in neonates. We will also ensure that this is particularly emphasised during induction training to all new trainee doctors in the department.

3. We discussed that unfortunately the post-mortem results are as yet unavailable but we felt as a department that the most likely diagnosis was one of sepsis, ie; overwhelming infection, and we discussed the signs that led us to this diagnosis. As above, we discussed that there were risk factors for infection, there was pre-term rupture membranes and there was prolonged rupture of membranes. Grunting can be a sign of fluid on the lungs or respiratory distress syndrome but it can also be a sign of infection. Child D showed temperature instability; initially on labour ward her temperature was low and then high on admission to the neonatal unit. We discussed that although blood tests did not particularly show raised inflammatory markers indicative of infection, Child D did have a very high bilirubin reading in the first few hours of life and this can be a marker for infection in the absence of any other explanation such as a blood group incompatibility, of which there was no evidence. Her clinical condition, ie; how quiet she was, was also indicative of infection.

4. We discussed the rationale behind the antibiotics choice. Benzyl Penicillin and Gentamicin are our first-line antibiotics and are given to neonates presenting with infection within the first 36 hours of life. We would then change to or add cefotaxime if a baby presented with sepsis at a later date and therefore this was why I added-in cefotaxime when I reviewed Child D in the early hours of Monday morning. We discussed whether her collapse could have been as a result of the cefotaxime, ie; the effects of a drug reaction. We discussed that this was very unlikely. The first episode of deterioration, from which she recovered, occurred before addition of the cefotaxime and in fact drug reactions in neonates are very rare as their immune system is not really competent enough to mount a reaction.

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5. We discussed Child D's care from a respiratory point of view. When she first arrived on the neonatal unit her saturations were found to be low and her blood gas poor showing high levels of retained carbon dioxide. She was therefore commenced on CPAP which would be our first line of therapy, particularly in a more mature baby such as Child D. Unfortunately, her gas continued to be poor on the CPAP and therefore she was intubated and ventilated on Saturday evening and received a dose of surfactant. Within an hour of being ventilated her gases were excellent. She was in air and we were able to wean the ventilator quickly overnight and she tolerated this very well. It was therefore a reasonable decision to take her off the ventilator in the morning given her relative maturity. Unfortunately, she did not manage off the ventilator and her gases deteriorated again but she remained in air. She was therefore commenced back on CPAP and her gases improved markedly and she remained stable throughout the day on Sunday. The first episode of deterioration occurred in the early hours of Monday morning whilst she was on CPAP. She became mottled and desaturated but quickly recovered and having received a bolus of fluid then had a good gas, normal blood results and normal observations including pulse, blood pressure and oxygen saturations of 100% in air.. She then became quite lively and was fighting the CPAP, trying to pull the mask off her face. It therefore seemed reasonable to take the CPAP away knowing that it could always be put straight back on if any problems were detected.

   She then went on to have a further episode of deterioration and unfortunately she did not recover from this.

   We discussed whether leaving Child D on the CPAP could have prevented this. I feel that this would have been unlikely. CPAP is not formal ventilation but just gives a little bit of positive pressure to support a baby's breathing. When Child D collapsed, doctors were in the room and immediately began resuscitation, including intubation and ventilation, to which there was no response. In view of this I think it very unlikely that the CPAP would have been enough to have prevented this episode or helped during this episode. We discussed this point in detail at our neonatal morbidity and mortality meeting and this was also the opinion of my colleagues.

6. We discussed the aetiology of the rash which is documented to have appeared during Child D's first episodes of deterioration. This appeared to look like bruising under the skin and we discussed that this was likely a sign of the effect the infection was having upon Child D's circulation.

7. We discussed the use of a capnograph to ensure the correct position of an endotracheal tube during the resuscitation and the fact that the capnograph indeed confirmed that the endotracheal tube was in the correct position throughout.

I hope that I have answered all of your questions clearly. I appreciate that this must be a very difficult time for you and if you have any further questions please do not hesitate to get in touch.

At the end of our discussions you gave me a beautiful card containing a picture of Child D and a poem which I have taken round to our neonatal unit and the staff have displayed for you.

I would just like to say again how sorry I am for your loss and if there is anything else I can do to help please do get in touch.

Yours sincerely

Dr Elizabeth Newby
CONSULTANT PAEDIATRICIAN

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