

Improving neonatal mortality in an Ethiopian referral hospital

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Abstract

Ethiopia has one of the world's poorest neonatal mortality rates (1). As a British paediatrician working for one year, the main aim was to improve neonatal care in a referral hospital's neonatal unit. An initial project looking at all admissions to the unit over the month of October 2012, revealed the death rate within the unit was 21% of all admissions. Of the 55 admissions only 43 (75%) had a temperature recorded at admission. 29 (67%) of these were hypothermic, and of these 29 initially hypothermic babies, 19 (65%) remained hypothermic or did not have another temperature documented during their stay. Only 33 (56%) had a heart rate and respiratory rate recorded on admission and only 11 (19%) had any further vital signs recorded during their stay. 19 of the admitted infants had a diagnosis of low birth weight and 10 (53%) of these either died or left against medical advice.

With this information regular basic neonatal care teaching sessions for doctors and nursing staff were initiated. Vital signs charts were introduced and unit specific protocols were written. Continuous Positive Airway Pressure (CPAP) was trialled and found to be effective, and CPAP training was given to all nurses and doctors on the unit. A room was set aside to be used solely as Kangaroo Mother Care (KMC). The nurses were taken to a very effective neonatal unit as an 'experience sharing' trip to help with motivation and a grant was also obtained for basic equipment.

After 6 months the project was repeated for all the admissions during February 2013. The death rate had progressively fallen and was 10% in February. 54 patients (98%) had a temperature taken on admission and of these, 27 (49%) were hypothermic. 25 (93%) of these hypothermic infants had subsequent temperatures documented which were normal. 54 (98%) had heart rate and respiratory rate recorded on admission and 50 (90%) had them recorded at least daily during their stay. Of the 22 babies with low birth weight (40%), only 4 (18%) died/left against medical advice. 4 received CPAP and 6 were treated with KMC.

Problem

The main problem with the neonatal unit is poor neonatal knowledge held by the nursing and medical staff. There was poor motivation and lack of accountability within the unit. Basic neonatal care such as thermoregulation and feeding/fluid management was poor. Monitoring of admitted babies was very poor. There was also a significant lack of resources such as clean blankets and caps, oxygen tubing, and oxygen. This was clearly a problem as the death rate was particularly high, and babies were developing co-morbidities and dying from preventable problems.

Background

The neonatal death rate in Ethiopia is one of the world's highest at 35 per 100,000 live births according to UNICEF (1). It is estimated that only 5% of births take place in a health facility. The Felege Hiwot Referral Hospital in Bahir Dar is the main referral hospital in the Amhara region of Ethiopia. It covers a widespread population of 5 million people. The neonatal unit there is relatively new, however, the nursing staff are not trained in basic neonatal care and there is poor leadership and accountability. The doctors, in particular the junior doctors, have little or no neonatal experience. There is poor funding and severe lack of equipment. As part of the 'Millennium Development Goals' there is great emphasis to reduce maternal and neonatal mortality in Ethiopia, and as a result UNICEF amongst

other charities are making neonatal mortality their main focus. UNICEF in conjunction with The Ethiopian Paediatric Society are working hard to train as many health workers as possible in neonatal resuscitation and basic care to improve neonatal care as a whole throughout Ethiopia.

Baseline Measurement

The problem was measured initially by gathering and looking at the notes of all the admissions for the month of October. Age at admission, birth weights, and gestations were all recorded. Diagnoses, vital sign documentation, treatments, outcomes, deaths, and death rates were also recorded.

There were 58 neonates admitted to the unit in the month of October 2012. 35 of the babies were admitted directly from the obstetric unit at age 0 days. Birth weights were all recorded except for 18 (31%) of neonates who had no gestation recorded in their notes. Diagnoses can be seen in the attachment, the most common being early onset neonatal sepsis, prematurity, and hypothermia. Temperature documentation and hypothermia management were measured (see attached). 22 (37%) had no heart rate and respiratory rate (HR/RR) recorded on admission and only 11 (19%) babies had any HR/RR recorded at any time after admission. The death rate was 19% and 55% of low birthweight babies either died or left against medical advice.

See supplementary file: ds2010.docx -
"diagnoses/documentation/hypothermia management/deaths"

Design

The initial results were discussed with the nursing and medical staff and joint plans were put into place to improve in four main areas; hypothermia management, patient monitoring, care of babies with low birth weight, and accountability.

We started with regular teaching/training sessions, starting with basic care and building from there, primarily aimed at the nursing staff. It was recognised very quickly that nurses were undervalued, underpaid and poorly motivated so the nurses were taken on an 'experience sharing' trip to another unit in Ethiopia where the nurses are particularly motivated and inspirational.

A grant was applied for and equipment was able to be purchased for the unit including cots, resuscitaires, resuscitation equipment, phototherapy, clipboards for 'vital sign charts', and heaters.

Evidence based protocols, tailored for the unit and it's resources, were written jointly by myself and local senior doctors, then clearly posted in the unit.

A homemade, evidence based, continuous positive airway pressure (CPAP) circuit was constructed from materials available to us, focusing on premature babies with respiratory distress syndrome. Training was given to everyone on the use of CPAP.

With regards to accountability and governance, 'death sessions' (mortality meetings) were introduced, where the deaths of all neonates were discussed as a group, looking to see where care can be improved for the future.

Clinical audit and record keeping was also introduced along with nursing handover checks and sheets.

Strategy

We felt nursing training and implementation would be the key to success to improve neonatal care, and by empowering the nurses they could take ownership of the unit and push themselves for improved neonatal care.

We started by training the nurses in basic neonatal care, including sessions on newborn resuscitation, hypothermia prevention/management and documentation.

We expected that the nurses would use this new training to make a significant improvement in neonatal care.

In reality, however, although the nurses utilised some of this knowledge, there was a severe lack in motivation and accountability, and as a result the care given did not improve to the degree we had expected.

To improve motivation, the nurses were taken to a particularly effective neonatal unit in the south of Ethiopia, where the nurses are responsible for their own unit and are very motivated. A two day course in basic neonatal care was also provided for our nurses.

Along with this 'experience sharing' trip we introduced clinical governance with mortality meetings and nursing handover sheets. A significant improvement has been seen since these interventions were put into place along side the training.

Results

Six months after introducing these interventions the project was repeated, looking at all admissions for the month of February 2013. The monthly death rates were recorded each month for the six months.

The death rate had reduced over the six months, from 20% in Oct 2012 to 10 % in Feb 2013 (see attached).

There were 55 neonates admitted to the unit, 65% of whom were admitted before one day of age. The weights of the babies were comparable with October's babies (see attached), however, 8 (14%) babies' weights were not recorded in October 2012 and only 1(2%) baby did not have their weight recorded in February 2013. Documentation of gestation had also improved, from 18 (31%) babies not having their gestation recorded in October to only 1 (2%) baby's gestation not recorded in February.

54 (98%) babies had their temperature recorded on admission and of these, 27 (49%) were hypothermic. Of these 27 hypothermic babies, 25 (93%) had subsequent temperatures that were normothermic. 2 (7%) did not have their temperature recorded again. 54 (98%) babies had their heart rate and respiratory rate recorded at admission and 50 (90%) had them recorded at least daily during their stay.

5 (10%) babies died, and of the 22 babies with low birth weight (40%), only 4 (18%) either died or were removed against medical advice, compared to 55% in October 2012. 4 LBW babies received CPAP, while 6 received KMC, neither of which were available/performed in October 2012.

See supplementary file: ds2014.docx - "gestation/birth weight/outcomes"

Lessons and Limitations

The most significant lesson learnt, is that you can teach and train a group but if they are not motivated or willing for change the training may be futile. We had to think of innovative methods to inspire and motivate our nurses before we started seeing positive change.

Nurses and good nursing care is paramount to any neonatal unit, and by empowering the nurses and encouraging them to take pride in their unit we expect this positive change to be sustained.

Accountability was particularly difficult to implement as this was a new concept for our nurses and some medical staff. Some staff

were not keen to engage with these new interventions as it increased their already substantial workload.

Staff Nurse Carin Lavalette, Dr Tesfa Tessfaye, Sister Anesha Dawed

Another problem we encountered was the high turnover of junior doctors through the unit, which at times made change difficult. This is detrimental to the sustainability of the project, however, the nursing staff are constant and we would hope they continue to implement these new interventions and encourage the new junior doctors.

As much of the interventions were based around training the current nurses, there may be issues surrounding sustainability, if and when they leave. We would hope that with the improved leadership, new nurses would be trained appropriately to continue this improved care.

Some doctors were resistant to change and not keen to work with us. Poor resources and lack of staff were excuses given regularly for poor basic care and lack of motivation.

One of our most substantial challenges was language. The mainstay of my work was with the nursing staff and the nurses speak very little English. Communication was very difficult, especially at the beginning of our placement. As my Amharic improved, implementing change became easier but remained a persistent challenge. The doctors have all their medical meetings and ward rounds in English which the nurses did not understand. As a result there was even a communication barrier between local doctors and nurses which resulted in misunderstanding and mismanagement at times.

Conclusion

Over a twelve month placement in an Ethiopian referral hospital's neonatal unit, we have seen a significant improvement in documentation and basic monitoring. Improved hypothermia management and care of low birth weight and premature babies (with CPAP and KMC in particular), has resulted in improved neonatal care and a reduction in the neonatal death rate. Improved accountability, motivation, and leadership has also contributed to this reduction and is particularly important to the sustainability of the project. Despite the many challenges and difficulties faced during the placement, it is clear that positive change is possible with basic interventions.

References

1. UNICEF. State of the World's Children 2006. New York: United Nations Children's Fund.

Declaration of interests

nothing to declare

Acknowledgements