Abstracts from the UK National Neonatal Transport Group Conference

Bristol Marriott Royal Hotel, 3-4 November 2016

Delegates attending the UK National Neonatal Transport Group Conference were invited to submit abstracts of original work as poster presentations. Some excellent entries were received and from these, the following five were chosen for oral presentation at the conference. A panel of neonatal transport experts awarded a prize to one winning presentation – Andrea Warnock of CenTre Transport Network.

Factors contributing to late finishes of transport team members in one transport network over a five-month period

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Prize winning presentation

Objective

To elicit factors contributing to transport team members leaving late from their shift, to ascertain if these factors are modifiable, and consider policies to reduce the impact of late finishes.

Design

Over a five-month period (Sept 2015 to Jan 2016), data were collected via a standardised proforma from team members who finished work ≥1 hour after their shift was due to end. The data were analysed to find common themes contributing to late finishes.

Results

Data were collected from 30 transportations where staff finished late. The average delay was 123 minutes (range 60-270 minutes). A total of 74 reasons for late finishes were documented. Reasons for delay could be divided into four main areas (base, journey, referral and receiving centre) with subdivisions of specific problem areas within each setting, including:

1. Base factors: cot locating (n=4), referrals coming late in the shift (n=6)
2. Journey factors: long journey times (n=9), traffic delays (n=6)
3. Referral centre factors (n=35): stabilisation of the sick baby (n=15), infusions not being ready (n=5), the need for procedures (n=4)
4. Receiving centre factors: handover (n=4).

Conclusion

Late finishes can be attributed to multiple factors within four main areas and, while some are unavoidable, there are areas for improvement; including ensuring referral centres are aware of their responsibilities prior to transport arrival and considering introducing a protocol for taking over care of babies that need prolonged stabilisation.

Embracing the will to survive: developing a survival training programme for a UK-based transport service

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Background

Despite the very high safety record in medical transport services, accidents can still happen. As a diverse range of missions are undertaken – at times travelling abroad over hostile terrain – there is potential for dire consequence. In the event of an incident, medical crew would need knowledge as well as the will to survive. Previously the Embrace transport service had a classroom-based session; now a practical training programme has been developed to enhance learning and fulfil the Commission on Accreditation of Medical Transport Systems (CAMTS) requirements.

Method

A review of reports from other transport services on their

survival training programmes was carried out and translated into an approach appropriate for the requirements of a UK-based service, combining it with the existing programme. Two pilot sessions were carried out with 10 participants in total. Questionnaires were completed before and after to evaluate the sessions and identify possible changes in content.

Results

Participants reported an increase in their knowledge when compared with the pre-session questionnaire. Participants felt more confident in their skills using equipment, communicating and keeping safe. There was unequivocal positive feedback on having a practical, outdoor session.

Conclusion

It is possible to develop a practical and pragmatic in-house survival training programme that participants enjoy and that leads to an increase in confidence and knowledge. Learners feel there is added value over a didactic session alone. The programme designed from this project is now being rolled out as part of the team's annual updates, in accordance with CAMTS requirements.

The use of transcutaneous CO_2 and O_2 monitoring on neonatal transport

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Background

Transcutaneous blood gas monitors based on the arterialisation of the capillary bed through local application of heat can provide information on the transcutaneous O_2 and CO_2 tension continuously and non-invasively. Their accuracy and reliability has been demonstrated previously in neonatal units. Potential advantages of transcutaneous CO_2 ($TcPCO_2$) monitoring over end-tidal CO_2 ($EtCO_2$) monitoring are that it:

- can be used in non-invasively ventilated patients
- works with high frequency oscillatory ventilation
- adds no dead-space to ventilator circuits.

Transcutaneous O_2 ($TcPO_2$) monitoring provides continuous information about tissue oxygen tension and could more easily detect hyperoxic events than saturation monitoring (SpO_2).

Aims

To evaluate feasibility and accuracy of $TcPCO_2$/$TcPO_2$ monitoring on invasively and non-invasively ventilated babies during transport.

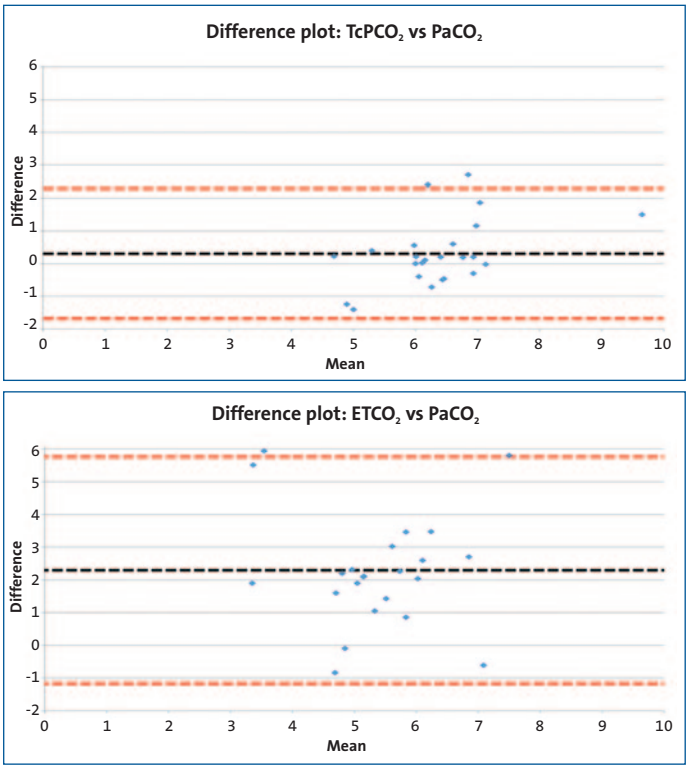

FIGURE 1 Bland-Altman difference plots.

Methods

A Sentec $TcPCO_2$/$TcPO_2$ monitor was applied to all ventilated (invasive and non-invasive) babies. Accuracy of $TcPCO_2$/$TcPO_2$ data was assessed by Bland-Altman analysis.

Results

Forty-eight babies (38 invasively, 10 non-invasively ventilated) provided 89 hours and three minutes of transcutaneous data (mean one hour 51 minutes per transport). The mean time for the monitor to equilibrate and produce valid data was 12 minutes. Transcutaneous tracing was not significantly interrupted by motion artifact or vibration. Forty four out of 48 recordings were uninterrupted. Four recordings experienced brief loss of signal, with a total monitor drop-out time of only 41 minutes. $TcPCO_2$ was a more precise measure of arterial/capillary CO_2 than $EtCO_2$ (**FIGURE 1**). $TcPO_2$ correlates well with PaO_2 (**FIGURE 2**).

Conclusions

Continuous transcutaneous monitoring is straightforward and reliable during neonatal transport with an extremely low level of signal loss.

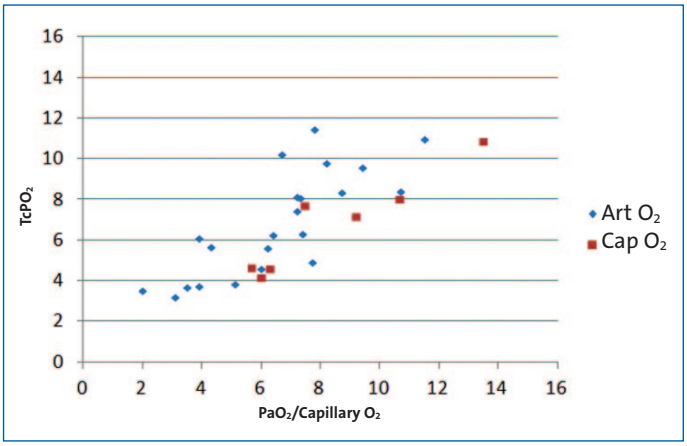

FIGURE 2 A scatter plot of $TcPO_2$ versus PO_2.

Predictors of unfavourable temperature outcome during neonatal transfers

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Background/aim

Arrival temperature at the receiving unit is one of the national quality parameters for neonatal transport. Maintenance of normal temperature during a transfer requires several strategies but can be challenging to achieve. We aimed to identify factors affecting unfavourable temperature outcome during neonatal transfers.

Method

Demographic and clinical data for transfers of neonates with a corrected gestational age of <36 weeks at the time of transfer were collected over a one-year period from the UHS SONeT database. Unfavourable outcome was defined as an arrival temperature at the receiving unit outside the range of normothermia (36.5-37.5°C).

Results

Normothermia on arrival at the receiving unit was achieved in 238 out of 269 (88%) transfers. Gestational age at birth and at the time of transfer was a predictor of unfavourable temperature outcome (OR = 0.89; 95% CI = 0.79-0.99; p=0.043 and OR= 0.84; 95% CI = 0.75-0.95; p=0.007, respectively).

Weight, respiratory support, distance and season were not significant predictors of unfavourable outcome.

A review of the temperature gradient (**TABLE 1**) showed that out of 222 transfers with normothermia at commencement of transfer, 202 transfers (91%) remained normothermic; in 12 transfers (5.5%) the patient arrived hypothermic and in eight transfers (4.5%) the patient arrived hyperthermic. Of the 47 transfers that started with an abnormal temperature, the team was able to facilitate recovery to normal temperature at the receiving hospital in 36 transfers (76%).

Conclusion

With appropriate strategies, a recovery to normal temperature during a transport episode is possible in the majority of transfers. Gestational age remains a strong predictor of unfavourable temperature.

Temperature at referring unit	Temperature at receiving unit		
	36.5-37.5°C Number of transfers	<36°C Number of transfers	>37.5°C Number of transfers
36.5-37.5°C	202	12	8
<36°C	14	5	0
>37.5°C	22	2	4

TABLE 1 Temperature gradient during transfers.

The changing face of the neonatal transport team: supporting end of life care in local units

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Background

The Acute Neonatal Transfer Service (ANTS) provides 24-hour emergency transfers from the 17 hospitals across the East of England. The team undertakes around 650 emergency transfers each year and has increasingly been asked to provide support in decision-making regarding reorientation to palliative care. Following discussion at a regional neonatal meeting, ANTS agreed to undertake a more detailed review to better understand the challenges faced and enable additional support to be tailored to training needs.

Methods

A retrospective review of all non-completed transfers between 1 January 2013 and 31 December 2015 with collection of clinical, demographic and logistical data.

Results

Twenty-four emergency transfers were aborted over the three-year period. Underlying conditions included severe hypoxic ischaemic encephalopathy (n=6), extreme prematurity (<26 weeks' gestation; n=7) and hypoxic respiratory failure/persistent pulmonary hypertension of the newborn (n=7). Three infants died before the arrival of the ANTS team; five others died during active CPR attempts involving the team; 11 had intensive care withdrawn in the face of ongoing clinical deterioration, and in five cases a decision was made to reorientate care in view of fixed, dilated pupils.

Conclusions

Joint decision-making regarding reorientation of care is a natural endpoint of some of the highest risk referrals to ANTS. In a small but significant number of infants who had fixed dilated pupils, however, there was reluctance from the referring consultant to reorientate care without a 'second opinion' from the ANTS team. As neonatal intensive care services are centralised and smaller teams become less experienced, transport teams may be increasingly asked to provide support with these challenging cases.