NEO FOR NAMIBIA
HELPING BABIES SURVIVE

MISSION REPORT

Mission 2017-2

November 11, 2017 to December 1, 2017

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NEO FOR NAMIBIA
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www.neo-for-namibia.org (coming soon)

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1. INTRODUCTION

Following the last mission in July 2017, we felt it would be important to return to the Rundu State Hospital as soon as possible to reemphasize our main educational points and get feedback from the local health care professionals. Identification of knowledge gaps and other obstacles is of paramount importance if our program is to be successful in the long run.

As on our previous visits, we were well received by the hospital administration, the physicians and the nursing staff from both the Prem Unit and the High Care Unit. It was encouraging to see their ongoing interest in our teaching sessions and the high degree of acceptance of our suggestions.

The support of the Health Minister, Dr. Bernard Haufiku, and his staff was once again invaluable, both to solve urgent medical problems and to help with administrative issues.

Shortly before leaving Switzerland, a small group of Swiss physicians (Thomas M. Berger, Deborah Gubler) and nurses (Sabine Berger, Flurina Prevost) decided to set up a non-profit non-governmental organization (NGO) called NEO FOR NAMIBIA – Helping Babies Survive (see www.neo-for-namibia.org). Hopefully, donations to this organization will allow us to continue and expand our efforts for years to come.

2. MAIN MISSION GOALS

Our main mission goals were a) to refresh knowledge on neonatal resuscitation, b) to discuss the diagnoses and management of common neonatal disorders, c) to supervise the use of the Pumani© bCPAP device, d) to reinforce writing of comprehensive and sound fluid and nutrition orders, and e) to provide bedside teaching by regularly accompanying the local health care staff during work rounds in the Prem Unit.

3. EDUCATIONAL SESSIONS

A total of 15 educational sessions were organized to train both physicians and nurses. Attendance was variable (ranging from 4–8 participants per session) and strongly affected by the workload of the health care professionals. All of the physicians of the pediatric department attended at least one of the lectures (Dr. Kamara, Dr. Vira, Dr. Moya, Dr. Nyembo, Dr. Banza, Dr. Alfonso, and Dr. Mohamed).

Finally, a total of 42 health care professionals from various departments attended Grand Rounds on common neonatal problems presented on Friday, November 11, 2017.

3.1 Lectures

The formal lectures covered the physiology and pathophysiology of neonatal adaptation, fluid and nutrition therapy, oxygen therapy, non-invasive respiratory support with continuous positive airway pressure (CPAP), as well as asphyxia and meconium aspiration syndrome.

3.2 Practical sessions

Practical small group sessions were used to train the practical aspects of neonatal resuscitation and the use of the Pumani© bCPAP device (1–3); an additional 6 nurses and 3 physicians were CPAP certified when they successfully passed a practical exam.

We were also able to train both physicians and nurses in writing detailed and individualized fluid and nutrition orders for sick neonates. It is important that all physicians comply with the new system and nurses provide the necessary information (incl. daily weight, actual oral and parenteral intake) during rounds.

4. WORK ON THE WARDS

4.1 Prem Unit

During our stay in Rundu, five patients were put on bCPAP because of severe respiratory distress due to hyaline membrane disease (surfactant deficiency) (Fig. 1–3). Three of them recovered over a period of several days and eventually were discharged home (Fig. 4).

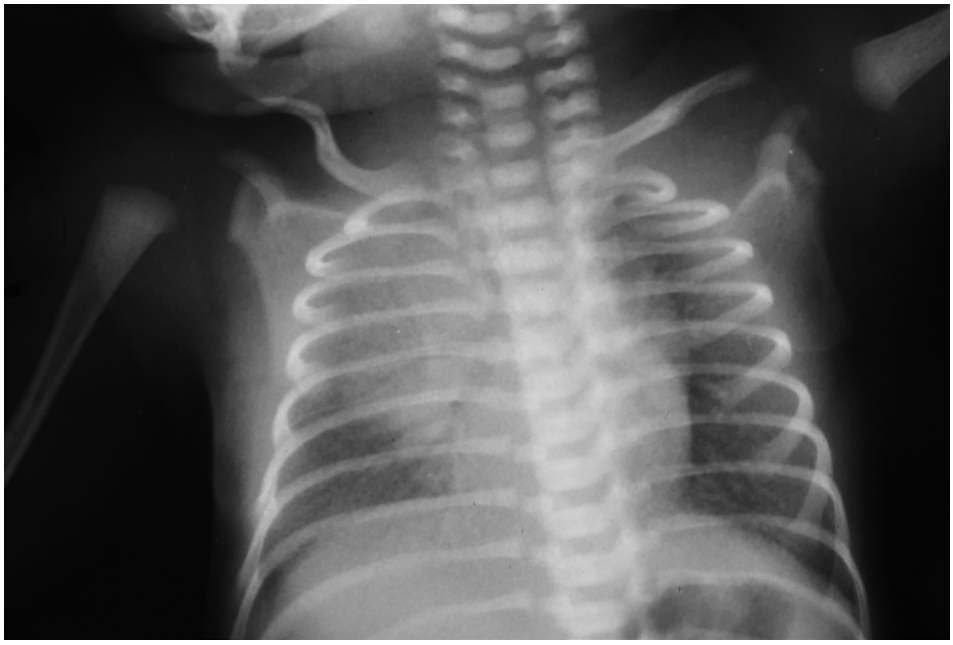

Fig. 1. Chest X-ray of a preterm baby showing signs of hyaline membrane disease (reticulogranular pattern, air bronchogram).

Fig. 2. Preterm infant on bCPAP monitored with a battery-operated Massimo® Radical-5 pulse oximeter.

Fig. 3. Preterm infant supported with a Pumani© bCPAP device.

Fig. 4. Finally, the day of discharge from hospital has arrived: the baby had suffered from hyaline membrane disease and had been supported with bCPAP for 5 days.

Fig. 5. Twin A (gestational age estimated at 30 weeks, birth weight 1280 g): rewarming after initial stabilization on the Pumani© bCPAP device.

Fig. 6. Twin B (gestational age estimated at 30 weeks, birth weight 1150 g) initially responded well to nasal continuous airway pressure (nCPAP).

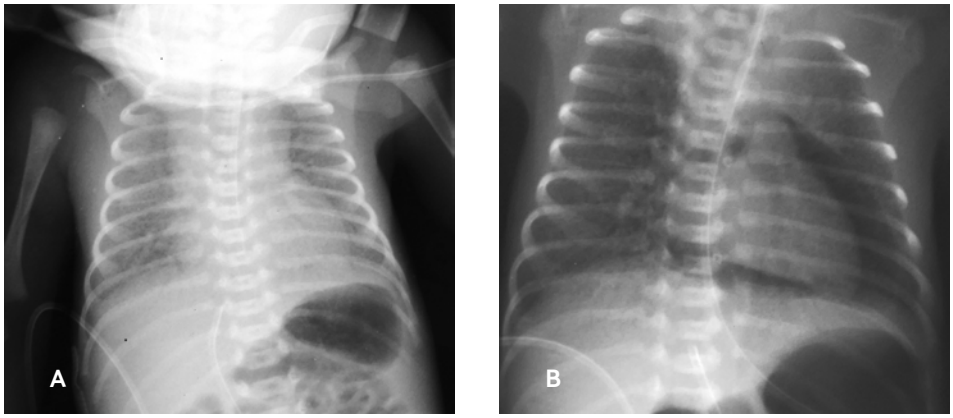

Fig. 7. Twin A: A) Chest X-ray following stabilization with bubble CPAP on day of life 1 showing signs of hyaline membrane disease; B) Chest X-ray following acute deterioration on day of life 2 revealing accumulation of air inside the pericardial sac (pneumopericardium).

Fig. 8. Twin A : A 24 G venous catheter was used to drain the pneumopericardium: despite initial aspiration of 8 ml of air, the patient's condition improved only transiently and he died a few hours later.

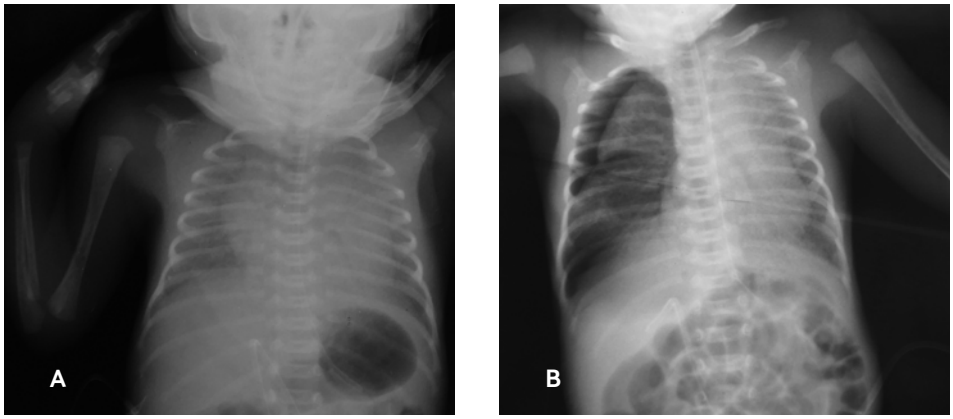

Fig. 9. Twin B: A) Chest X-ray following stabilization with bubble CPAP on DOL 1: low lung volumes, reticulogranular pattern and air bronchograms, consistent with hyaline membrane disease (note malposition of the UVC in the portal vein); B) Chest of X-ray following gradual deterioration on DOL 3: right-sided pneumothorax with mediastinal shift to the left (note malpositioned UVC).

Fig. 10. Twin B on DOL 3: A 24 G venous catheter was used to drain the pneumothorax: because of lack of a continuous suction system, intermittent manual aspiration was performed every 5 minutes over 6 hours (until the patient's death).

Fig. 11. Preterm infant (estimated gestational age 32 weeks, birth weight 1440 g) with severe hyaline membrane disease: treatment was restricted to supplemental oxygen with resulting oxygen saturations between 44–88%; when cardiac arrest occurred after several hours, resuscitation restored spontaneous circulation, but the infant failed to start breathing again and died.

The remaining two infants were twins (birth weight 1280 g and 1150 g, respectively) born at a gestational age of approximately 30 weeks on the way to the hospital, where they arrived in critical condition with severe hypothermia (33.2°C and 33.3°C, respectively) and hypoxemia (SpO2 of 45% and 48%, respectively). They both had surfactant deficiency and initially could be stabilized on bCPAP (Fig. 5, 6). Unfortunately, they died within 72 hours from air leak complications (Fig. 7–10). Since there was no continuous suction system available, manual aspiration following the insertion of drainage catheters was attempted but ultimately failed (4).

We encountered another patient on nasal cannula oxygen because of respiratory distress who deteriorated during nighttime and went into cardiac arrest in the early morning hours. He was resuscitated with recovery of spontaneous circulation but failed to develop adequate respiratory drive and died (Fig. 11). We used the analysis of this case to encourage the health care professionals to use CPAP early to increase the chances of success.

Despite the mixed results, we were delighted to see the skills and dedication of the nursing staff. We hope that their learning curve will be steep, and an increasing number of babies will benefit from this technology first introduced at Rundu State Hospital in July 2017. Apart from early use of bCPAP in patients with significant respiratory distress, we also encouraged the use of X-ray as a diagnostic tool and to help therapy. Additional teaching will be required to help with the interpretation of chest X-rays (Fig. 1, 7, 9).

Participation in daily work rounds and routine care of the patients proved to be very valuable. It allowed us to teach detailed aspects of neonatal care on a 1:1 basis (Fig. 12–13). Physicians were willing to write fluid and nutrition orders as suggested. They accepted that babies should almost always receive at least minimal enteral nutrition and advancement of enteral nutrition (with mother's milk) should be a priority. We also insisted that umbilical venous catheters and peripheral intravenous lines should be removed when they were no longer utilized to minimize the risk of catheter-associated infections. We encouraged the use of C-reactive protein measurements to guide antibiotic therapy (5).

Fig. 12. Working together with the local staff during daily work rounds (from left to right: Cecilia Ndepavali, RN, Mechthilde Mukosho, RN, Kornishuk Vira, MD, Thomas M. Berger, MD).

Fig. 13. Working together with the local staff at the bedside to provide 1:1 teaching on everyday aspects of neonatal care.

Fig. 14. Kangaroo Mother Care is encouraged to provide skin to ski contact during as many hours a day as possible.

Fig. 15. Kangaroo Mother Care: the tube cloth sowed at the local marked holds the baby firmly in place.

Fig. 16. Kangaroo Mother Care: during our stay, we encountered this former 680 g twin who survived against all odds – an African miracle story!

Fig. 17. A mother is gravity gavage feeding her preterm baby.

Fig. 18. Mothers clean the equipment used to collect and feed expressed breast milk.

Fig. 19. Two hand blower dryers are installed to improve hand hygiene.

In July 2017, we had bought some reclining folding chairs to facilitate Kangaroo Mother Care (6). To further encourage this method, we bought some cloth at a local Chinese store and asked tailors at the local marked to sow Kangaroo skin to skin tubes (Fig. 14 – 16).

We were once gain impressed to see how much mothers are involved in the care of their infants: they feed their infants by various methods (breastfeeding, gavage feeding, cup feeding) (Fig. 17), express their breast milk and clean the equipment used for this purpose (Fig. 18). To accomplish this, they sleep together in one large room and need to get up every three hours.

To improve hand hygiene, we installed two hand blower dryers (Fig. 19) since paper towels were not available and hands could only be dried on a single cloth towel used by everybody.

4.2 High Care Unit

One of the donated bCPAP machines is used for infants admitted to the High Care Unit. Prior to our arrival in November, at least two patients had been treated successfully, whereas two infants with HIV-related pulmonary disorders could not be saved.

During our stay, we trained additional nurses from the High Care Unit in the use of non-invasive respiratory support; we again encouraged early use of bCPAP to stabilize patients as compared to late use in patients who have already decompensated. Proper storage of the equipment was also emphasized as well as timely replacement of consumables or damaged parts.

On one occasion, we were directly consulted to advise on the care of an infant who had been admitted following surgery for intussusception. When we arrived, the girl was on mechanical ventilation; however, we found that accidental extubation had occurred (inappropriately high leak and abnormal flow curve). Fortunately, she could remain extubated. We advised on the use of balanced electrolyte solutions and the provision of a concentrated intravenous glucose solution to prevent lipolysis and ketoacidosis.

5. FEEDBACK

We were interested to get feedback from physicians, nurses and mothers, and therefore asked for written feedback. We were overwhelmed by their statements and strongly encouraged to continue our efforts (Fig. 20).

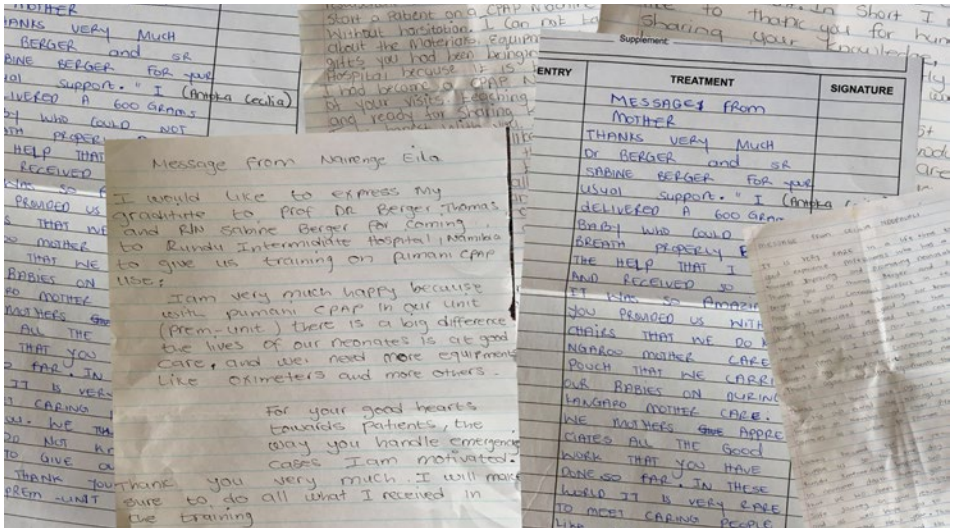

Fig. 20. Feed-back letters from mothers, nurses and physicians.

«Thanks very much Dr. Berger and Sr. Sabine Berger for your unusual support. I delivered a 600-gram baby who could not breathe properly without the help that I saw and received so far. It was so amazing. You provided us with chairs that we use for Kangaroo Mother Care (...) We mothers appreciate all the good work that you have done so far. In this world, it is very rare to meet caring people like you. We do not know how to give our thanks.»
Prem Unit Mothers

«Your support has repeatedly played a key role in our success in making additional help available for children whose severe respiratory distress fails to respond to oxygen therapy by using the bCPAP and improving monitoring of children on oxygen. There is no way to fully express our gratitude for your loyalty. We at Rundu State Hospital are continually inspired by the dedication and generosity of NEO FOR NAMIBIA who continues to give again and again.»
Isha Kamara, MD

«I would like to express my gratitude to Prof. Dr. Thomas Berger and RN Sabine Berger for coming to Rundu Intermediate Hospital, Namibia, to give us training on Pumani CPAP use (...) For your good hearts toward patients, the way you handle emergency cases, I am motivated.»
Eila Nairenge, RN

«It is very rare in a life time to meet good experienced professionals who have a mission towards improving and promoting neonatal health (...) I will carry on your mission in the Prem Unit and continuously supervise and support my subordinates to improve neonatal care (...) Thanks and thanks again!»
Cecilia Ndepavali, RN

«Words alone cannot describe my gratitude. I am so grateful to the extent that I become speechless (...) Your trainings have improved my life when it comes to knowledge. Now I can resuscitate a neonate and monitor or start a patient on a CPAP machine alone without hesitation. (...) To be honest with you: the world needs a lot of people like you who are willing to share their knowledge.»
Johanna M. Lirunga , RN

«Well, I do not have the words to express the gratitude for the generous work you have done in our department. In short, I would like to thank you for humbly sharing your knowledge, care, love, patience and mostly your smiles. Please, continue your wonderful work.»
Marceline Alexander, RN

6. MEETING WITH MEMBERS OF THE MHSS

Once again, we were able to meet with the Health Minister, Dr. Bernard Haufiku, as well as Dr. Axel Tibinyane and Dr. James Benjamin. We discussed the current status of our efforts and explored the scope of our future involvement. In particular, we were interested in how we could support the timely opening of the new maternity and neonatology ward at Rundu State Hospital. In addition, we addressed the issue of unreliable supplies of important drugs, such as caffeine (used to treat apnea of prematurity). We promised to explore possibilities to either facilitate importing the drug in a suitable form or to provide information on local production.

We also clarified the status of our NGO as an independent organization. NEO FOR NAMIBIA – Helping Babies survive will focus on neonatal and pediatric intermediate and intensive care and develop care bundles that are primarily tested as pilot interventions at the Rundu State Hospital; if their implementation proves to be successful, expansion of the program to cover other hospitals in Namibia is desirable.

7. NEXT STEPS

Continuation and consolidation of our efforts at Rundu State Hospital remain a priority for 2018. We plan to return to Rundu in April, July and November of this year. We hope that our friends and collaborators Flurina Prevost, RN, and Deborah Gubler, MD, will have an opportunity for a first visit to meet with local health care professionals.

Thus far, our neonatal care package taught at Rundu State Hospital covered neonatal resuscitation, thermoregulation, neonatal sepsis (incl. the appropriate use of antibiotics), differential diagnosis and management of neonatal respiratory distress (incl. the use of chest X-rays, respiratory support with nasal cannula oxygen, nasal bCPAP and oxygen saturation monitoring), fluid and nutrition management and Kangaroo Mother Care.

We plan to write standard operation procedures (SOPs) in collaboration with our local champions, both from the physician and nursing staff.

Finally, we hope to be able to increase our funding efforts to allow our program to continue at Rundu State Hospital and to eventually expand to other hospitals in the poor northern region of Namibia.

Prof. Thomas M. Berger, MD
NEO FOR NAMIBIA
Helping Babies Survive

Sabine Berger, RN
NEO FOR NAMIBIA
Helping Babies Survive

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