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Letter to the Editor

Bridging the gap in respiratory medicine: How a pulmonologist from other continent can help African children who "can't breathe?" The story of a European professor and his African trainee

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ABSTRACT

An European pediatric pulmonologist successfully organized a 2-year in-house pediatric pulmonology training with simultaneous establishment of the first pediatric pulmonary center in Ethiopia. Collaboration of the local institution with a non-governmental organization (NGO) facilitated the realization of the program. Training cost was significantly low compared to the expected out of country training, with extra financial benefit enabling purchase of equipment for the center. Our experience shows that specialists from developed countries can be instrumental to establishing cost-effective training programs and founding of specialized services in low-income countries by training subspecialists in their own setting. NGOs and leading international professional societies can support such programs to relieve the suffering of the child who "can't breathe" because s/he is born in a low income country.

Keywords: Pediatric fellowships, Pulmonary medicine, Child, Low-income setting

Care of a preschooler with breathing difficulty in remote African settings

A few years ago while I was in pediatric pulmonology training, a 3-year-old child was referred to my clinic because she "can't breathe normally" now and then for more than 2 years. She had 16 previous admissions, countless sleepless nights, and outpatient visits to different clinics. Although her atopic pre-school asthma is a relatively uncomplicated diagnosis, she never received proper evaluation and care that could give her normal breath. Her problem was not a lack of pediatricians; she had seen more than one and only received different antibiotics. The problem was the unavailability of a properly trained pediatrician who could have given her a controller instead of changing antibiotics or adding another cough syrup. Being in that room with the child and her parents for nearly 45 min and listening to all the sufferings in those years, unlike her previous pediatricians, I was looking at the problem through my mentors eyes, though he was not physically there, and it was my responsibility to make it right and end her agonizing breath and turn it to a breath with a smile, or otherwise she will continue to breath in anguish, intermittently, perhaps until her last breath. The start of a low-dose inhaled corticosteroid (ICS) changed her life completely and gave her family their happy playful child back. She has only few

mild exacerbations since and is leading a normal life. This is the story of many children in my practice and millions in Africa suffering because of lack of optimal care.

INTRODUCTION

Until October 2017, there was only one pediatric pulmonologist in Ethiopia, a country with population of 112 million.[1] The first pediatric pulmonologist was trained through the East African Training Initiative (EATI) program.[2] A new collaboration was established between Germany Senior Experts Service (SES), and St. Paul's Hospital Millennium Medical College SPHMMC in Addis Ababa, Ethiopia, to train the second generation of fellows in Pediatric Pulmonology in the country. The program was started in October 2017 and completed the first round effectively in November 2019 and the second fellow in the same program is currently more than halfway to complete her training.

While respiratory diseases are the most common causes of both morbidity and mortality in this highly populous country with nearly 45% pediatric age,[3] there was no pediatric respiratory specialist in the country. We thus desighned and implemented the program as soon as the collaboration was established.

Lower respiratory infections are the second most common causes of under-five mortality worldwide[4] and asthma is a rising concern with high rate of underdiagnosis and undertreatment in developing countries.[5-7] Allergic diseases were documented in 27% of children in the country.[8] Even countries like Nigeria with established respiratory training programs and better health system had unmet needs of respiratory care in both capacity and quality.[9] Specialized pediatric respiratory services are increasing in other African countries and are urgently needed in Ethiopia.[10,11] Our program was exceptional in that was fully completed in-house except for a 1-week hands-on course on bronchoscopy organized by the European Respiratory Society (ERS) in Cairo, Egypt.[12] This helped us to establish the first Pediatric Pulmonology Center in the country at a very low cost. As previous work has demonstrated the role of collaboration in new residency trainings in low-income countries, our experience can be used as a model to establish pediatric and other subspecialty trainings and services in low-income countries.[2,9,13,14]

OPPORTUNITIES

Globalization with closer connection has opened the way for many successful collaborative works. In my early career as a pediatrician, I was fortunate to meet Professor Frank Riedel, an experienced pediatric pulmonologist from Hamburg in January 2015. At that time, I was a visiting lecturer in a new medical college in Southeast Ethiopia, where he was teaching medical students. After my return to Addis Ababa, a discussion with the Provost, a pediatrician by profession, ended up with the invitation of Prof. Riedel. This was a time many specialists in SPHHMMC were trying to get subspecialty training in India. Professor Riedel's visit, however, brought, a different and unexpected inspiration: to start the first Pediatric Pulmonology fellowship and establishment of a Pediatric Respiratory Center in SPHMMC.

Our most important resource at the time was the expert's commitment for a 2-year volunteer service to train fellows in Pediatric Pulmonology. The SES, a German non-profit organization, covered insurance and travel costs for the 2 years. A Pediatric Pulmonology training curriculum was prepared based on Pediatric Harmonized Education in Respiratory Medicine for European Specialists (HERMES) curriculum[15] of the ERS. This initial effort gave me the chance to be the first fellow enrolled in the program in October 2017.

The college's adminostrative support was strong despite the difficulty with starting a completely new program. The college purchased the required equipment including pediatric bronchoscopes (both rigid and flexible), allergy test kit, and spirometer. Availability of imaging (including multidetector high resolution CT) and laboratory services despite some limitation were additional resorces for the training. The adult pulmonology center in the hospital was established by a pulmonologist trained through the EATI 2 years earlier and our close collaboration was an additional resource and was vital especially in the bronchoscopy training.

Through our international collaboration with different supporters, we established sweat chloride testing, respiratory syncytial virus survey, high-flow nasal cannula ventilation (HFNC), sleep studies, and tuberculin skin tests, most of which were being made available for the 1st time in the country. We also worked with the University of Michigan through a series of online lectures, case discussions, and Prof. Samya Nasir's visits from Michigan to Ethiopia. She continues to be our strong supporter.

This exemplary collaborative work ended up with the establishment of effective in-service fellowship training in pediatric pulmonology and the first pediatric pulmonology center in Ethiopia which left in me, as the first fellow in the program, an amazing experience of the excellent team work with the local and international partners.

THE TRAINING PROCESS

The training was a full 2-year program with face-to-face contact between the mentor and trainee for half of the time and with a rotation to other related specialties including anesthesia and adult pulmonology division. The trainer

continued to participate through different remote methods including consultations and video conferences during the other half when not onsite and while on a rotation to other units. Our program is similar to EATI in many ways such as being in-country with both onsite and remote training options. However, EATI is an adult respiratory training run through an expanded support from the organizers and delivered by a number of specialists who spent time rotating being present in Ethiopia. We looked for a non governmental organization to support the training and utilized team work to accomplish a complete training by a single trainer for the whole course of the program.

The first fellow was limited to one for two reasons. First, as the training was just starting without adequate facility like bronchoscopy, it was difficult to train more fellows simultaneously on skill acquisition. The other reason was staff limitation to commit more trainees at the same time. However, a second fellow joined the program by the end of the 1st year (November 2018).

SUSTAINING THE PROGRAM

The initial purpose of the program was to self-sustain the training and service with a gradual transfer of responsibility from the foreign mentor to the in-house trained pediatric pulmonologist. As planned initially, after the completion of the training of the first fellow, although the foreign trainer is still participating in the process remotely, I took over the main responsibility of both the clinical care and continuation of the training. We are also preparing to receive new fellows after completing the training of the second fellow. We also had strong collaboration with TASH and further collaboration with the pediatric pulmonary unit on research, training and clinical care to better impact both institutions.

CHALLENGES

However, this development was not without challenges. The first was the lack of experience in multidisciplinary team work in our setting. The nursing team from endoscopy and the colleagues from anesthesiology, microbiology, pathology, pediatric/thoracic surgery, and otolaryngology were all required in the training as well as service provision. This made our work challenging requiring a lot of persistence and negotiations, some of which worked out well and others still not perfect.

The second challenge was the lack of adequate space for clinical services. We had only 2½ days for bronchoscopy, 1½ days a week for a follow-up clinic with the other days being occupied by other subspecialty services.

Because of these and other additional limitations [Table 1], we were able to reach only a limited number of children in service provision. Despite all these challenges and limitations, the benefits of the program were well demonstrated [Table 2].

LESSONS LEARNT

Multi-institutional collaboration from local and international players gave us the best result to organize our training and service establishment in pediatric respiratory care for the first time in the country.

A significant cost was saved by in-service training and spent for purchasing drugs and medical equipment and continuity of clinical care and education was maintained after completion of the formal training.

An interesting lesson we learnt is the exceptional role that retired or pulmonologists in their sabbatical leave could play in collaboration with local and international supporters in addressing the delivery of specialized respiratory training and service in low and middle income countries.

Table 1: Challenges in the program.

1. Multidisciplinary team	• Anesthesia – tight schedule and shortage of staff, clashing bronchoscopy bronchoscopy schedule, no pediatric anesthesiologist • Only one pediatric surgeon and lack of cardiothoracic surgeon • Lack of trained respiratory nurse/therapist • Lack of respiratory and general pediatric physiotherapists • Inadequate programming and staffing of clinics and units
2. Drugs and equipment	• Irregular availability of propofol and other drugs for sedation • Shortage of asthma medications especially inhaled corticosteroids • Irregular availability of spacers or high cost when available
3. Laboratory	• Under performance of microbiology including fungal diagnostic capacity except for KOH • Limited workforce and equipment including culture potential • No PCR tests
4. Pathology service	• No lung pathologist • No experience in lung biopsy
5. Endoscopy	• Bronchoscopy unit shared with gastroenterologists • Nursing staff limitation
6. Space	• Once weekly available space for follow-up with up to 30 patients per day • Inadequate space for procedures such as spirometry, allergy test, tuberculin skin test, and sweats chloride tests

Table 2: Benefits of a local training.

- Minimized costs of fellowship training (> 35,000 USD saved over the 2-year training)
- Ongoing clinical service
- Fellowship cost used for equipment purchase: Part of saving used to equip the unit with both rigid and flexible bronchoscopy and other vital equipment
- Establishment of a pediatric pulmonary unit
- Multiple stakeholder collaboration: International and national
- Best practice lessons
- Maintain ongoing fellowship program in the country
- Enough and high variety of cases
- Avoid frustration and waiting time for a foreign-trained physician to start service
- Improved quality of care
- Research development and training
- The academic and clinical services including the pediatric residency program were supportive of one another through the process

THE WAY FORWARD

Continued collaborations and support in equipment from the college, ministry of health, and others are still ongoing. While the EATI is also training another fellow in pediatric pulmonology, there is a strong need to expand the training. We are trying to expand our program to train more fellows and train general pediatricians and pediatric residents on respiratory care. While this has been an exciting experience, we understand that this is just the beginning and will require dedicated years of work and continued collaboration to achieve what our children deserve in respiratory health.

As the first fruit of such a harmonious collaboration, I have witnessed and had been part of all the changes through these exciting times and had seen the impact and the new success that an experienced individual achieved in his retirement. I am now a pediatric pulmonologist who had the privilege to care for these children and to train the new generations of pediatricians behind me after my own world of pediatric pulmonology was opened by a retired pediatric pulmonologist from Europe. I am motivated and encouraged by the children who have their breath back and by my enthusiastic pediatric residents who are eager to learn the proper respiratory care during their pulmonary rotation. These are my incentives to relieve the suffering of the next child and to teach myself and the next generation. I strongly believe that if the leading professional societies (such as PATS, ERS, and ATS) participate in organizing and inviting their senior members in their sabbatical and retirement to take part in such trainings of the trainers for pediatric respiratory medicine in developing countries, a tremendous capacity can be mobilized all over the world and we can achieve a great success in a shorter time.

CONCLUSION

In-country training of fellows with collaboration and service establishment should be prioritized over a full abroad training whenever possible. International institutions should also focus on in-country capacity building to improve and maintain subspecialty training and service in pediatric respiratory medicine. A strong international collaborative work of this type should continue until all children who "cannot breathe" are breathing comfortably!

Declaration of patient consent

Patient's consent not required as there are no patients in this study.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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