

Medical missions of the African Hungarian Union

The XIXth Special Surgical Doctors Mission to Malawi¹

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Abstract:

This article discusses the charitable medical activities of the African Hungarian Union (AHU) – a Hungarian not-for-profit organization – in Africa and highlights one of the Ear-Nose-Throat (ENT) missions to Malawi. This paper also reviews food security issues in correlation with health and features the mission’s anaesthetic procedures in details. As an aim, it also tries to draw attention to the positive effects of such medical operations.

AHU was established in 2006. Since 2009 the organisation has coordinated XXIV doctors’ missions to different African countries, including the Democratic Republic of Congo (DRC), Mali, Madagascar, Guinea, Uganda and Malawi. These missions were sponsored mainly by AHU and its individual sponsors and companies, as well as the participating doctors, who sometimes devoted not only their precious time but fundraised money to contribute to the budget. The XIX mission was one of the seven special surgical missions. Out of all the recipient countries—due to mainly logistical reasons from AHU’s side—only Malawi ended up in the fortunate situation to host surgical missions. This Medical Mission focused on Ear-Nose-Throat (ENT) surgeries, and general health care. The four Hungarian doctors, together with the local medical staff, performed 35 ENT operations in two operating theatres in two weeks. No postoperative Intensive Care Unit (ICU) admission was needed among the patients. Neither surgical nor anaesthesiologic complications occurred during the perioperative period, resulting in an overall very successful medical mission.

Keywords:

medical missions;
Sub-Saharan Africa;
health;
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surgeries.

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Introduction

Health care and its accessibility in Sub-Saharan Africa

Health care in the Sub-Saharan African region is generally of poor quality (Stierle et al, 1999; Mirabel et al, 2015; Ekenze et al, 2019). Neither the number of health care professionals nor medical equipment is adequate to serve the population suitably. Good quality health care is very often not available even to the handful of wealthy people who, if needs arise; have to travel outside the continent. Generally, expatriates in high paid jobs and well-to-do local business people can afford to have expensive health insurance that cover the costs of overseas trips or even the treatments of some of the scarcely found, well equipped and staffed private hospitals. For the masses of people, however, the options are limited to small clinics with less qualified medical staff or the so-called medicine/voodoo man. Especially in the countryside, hospitals can only be found far away from one another. Many sick people have to travel long hours, or if unlucky, even walk a day or two. According to F. Stierle et al (1999) in sub-Saharan Africa, the availability of, and geographical access to, health care services, particularly in rural areas, are rather low. In general, utilization of services is very low, too. If it comes to the worst-case scenario, far too often people do not even know the exact cause of death.

History of medical missions

The tradition of “Western” professionals going to Africa and trying to pass on their knowledge or volunteer their expertise is a long one. International medical missions to Africa have been organised for a long time now. It has a vast literature that is very well documented and preserved in the history books, as well. One of the most famous examples is David Livingstone, who himself worked as a medical doctor at the mission station in Kuruman, South Africa in the 1840s. Faith-based medical missions introduced Western medicine and public health in much of Africa decades in advance of health services provided by colonial governments (Good, 1991).

Despite immense documentation of Anglophone medical missions, very little is known of the first Hungarian medical missions. This could well be due to historical reasons. Hungary has never been a colonising country and therefore had few ties with Africa. Also, Hungary’s geopolitical situation – being a landlocked, small county that had to fight for its freedom rather than colonising another land – did not allow the country nor its citizens to make more than a handful of expeditions.

It has only been recently that a fairly new non-governmental organisation set out to put Hungary on the map of international medical missions to Sub-Saharan Africa.



History of AHU's medical missions

The African Hungarian Union is a non-governmental organisation based in Budapest, Hungary, established in 2006. AHU's main focuses are international development and supporting African-Hungarian relations. AHU organizes long-term support programs for social groups and minorities in Africa who are cumulatively disadvantaged. AHU has launched medical programs in more than ten African countries, the first one in 2009 to DRC, then others to Angola, Ethiopia, Guinea, the Democratic Republic of Congo, Madagascar, Malawi, Mali, Morocco, Mauritania and Uganda. Since that first program in 2009, dozens of Hungarian volunteer health professionals have participated and thousands of patients have been examined throughout these medical missions. Doctors attended to patients at places such as the Kiwanja Refugee Camp (DRC), Bamako (Mali), Los Island (Guinea), Antsirabe (Madagascar), Mbale (Uganda), Blantyre (Malawi), and in villages where healthcare does not exist at all or is difficult to access. AHU has been the largest sponsor of the Hungarian Africa partnership since its foundation in Hungary. AHU is the continuous supporter and sponsor of science and expeditions, exhibitions, art activities, book publishing, and awareness-raising programs.

During these missions, Hungarian doctors and healthcare professionals reach thousands of people, especially children and women, who otherwise would have a very limited chance to get proper medical attention, if any at all. Through the missions, there is always an exceptionally strong spirit combined with genuine interest to help the underprivileged both by medical doctors and other members of the missions. Apart from solving urgent medical issues, the missions also empower the inhabitants of the target regions by spreading very useful knowledge on health and hygiene, as well as changing their attitude towards, and enhancing their knowledge of, the aforementioned points. Furthermore, donations ranging from medical equipment to educational material and children's toys are shared during the missions, which also contribute to the well-being of the target groups in the receiving country and create a sense of cooperation, empowerment and sustainability (ahu.hu).

Malawi

Malawi (*Figure 1*), a small, landlocked country that lies south of the Equator in Sub-Saharan Africa, stretches about 520 miles (840 kilometres) from north to south. It has a width varying from 5 to 100 miles (8 to 160 km). Its size (118.113 km²) is slightly bigger than the size of Hungary (93.030 km²). Malawi's climate is subtropical. The rainy season runs from November through April. There is little to no rainfall throughout most of the country from May to October (Stalker, 2010). Malawi has been experiencing rapid population growth at a rate above average for sub-Saharan Africa. Birth rate is among the highest in the continent, but mortality rate is also high, and life expectancy for both genders is significantly lower than the average for sub-Saharan Africa, primarily because of the incidence of HIV/AIDS. Nearly half the population is younger than 15, and about three-fourths of the population is 29 or younger. A modest reduction in the country's high fertility rates in the late 20th and early 21st centuries

may be attributed in part to government policy aimed at improving female literacy and promoting more-effective contraceptive methods (Ingham et al, 2021). The last census was carried out in 2018. According to its statistics the size of the population is 17,563,749. This is an approximate 35% increase in a decade, as the 2008 census enumerated 13 million residents. Life expectancy is 61.1 for men (79.4 in the UK) and 67.4 for women (83.1 in the UK) (UNDP, 2020; ONS, 2021). Although Malawi is one of the most densely populated countries in southern Africa, it is also one of the least urbanized, with more than four-fifths of its people living in rural locations. The official languages are Chichewa and English.



Figure 1. – Malawi. Source: Encyclopaedia Britannica Inc. (2021)

Malawi's Economy

Malawi is one of the poorest countries in the world: in 2019 it had per capita gross domestic product adjusted for purchasing power parity of US\$1,035, compared with per capita GDP/PPP US\$1,970 for Africa as a whole. For comparison in the same year per capita GDP was US\$46,071 in the UK. Agriculture accounts for more than one-third of GDP and 90% of export revenues. Nearly 90% of the population engages in subsistence farming. The performance of the tobacco sector is key to short-term growth as tobacco accounts for more than half of exports. The economy depends on substantial inflows of economic assistance from the IMF, the World Bank, and individual donor nations. Around 52.6 per cent of the population live below the national poverty line while 70.3 per cent of the population get less than PPPUS\$1.9 a day. Malawi was approved for relief under the Heavily Indebted Poor Countries (HIPC)



program. The government faces many challenges, including developing a market economy, improving educational facilities, facing up to environmental problems, satisfying foreign donors with fiscal discipline being tightened. In 2019 the adult HIV/AIDS prevalence rate stood at 9.2% which has slightly improved, since it had stood at 11.9% in 2007 (UNDP, 2021).

Malawi and Food Security

It is quite straight forward for all people that the quantity and quality of food is crucial for the well-being of the individual, the community (family, village community), the country or the world, while at the same time complementing its health status.

While the population of developed countries is overwhelmed by the problems of civilization (obesity, cardiovascular diseases or mental disorders due to overconsumption), developing (in more recent terminology: emerging) countries are facing a serious challenge to access food in appropriate quantities. Although in many cases this can be traced back to other and various reasons, the greatest challenge has been found to be insufficient food quality in all categories, in all places (Juhász, 2017).

There are aspects which have been ignored by average consumers (in some cases, many professionals as well). For example, regarding food-vulnerability, they fall under the spell of statistics, and based on some significant results, ignore reality.

It can be stated that relatively few people deal with the mental effects of food vulnerability, which has had a major impact on people's physical and mental well-being, and thus health, as was even true during prehistoric times. This vulnerability has accompanied humanity throughout time and become part of the history of the living world. Access to food is the foundation of ages and civilizations. If sustenance is not available, one cannot talk about any basis of existence, especially not development.

Human food must be quantitatively adequate, which does not always ensure sustainability, as food ingredients, content value and the number of harmful substances in the human body greatly affect the quality of life and health of the population of the developed and developing (emerging) world (World Food Summit, 1996).

The living conditions and insufficient access to healthy foods also badly affect the health situation. Malawi is one of the worst countries in regard to food security and, consequently, the health situation there also ranks near the bottom statistically. In 2015, only sixteen countries performed worse than Malawi in this respect according to the Global Food Security Index. Based on the Human Development Index of the UNDP, out of the 188 examined countries, Malawi ranked 173rd (UNDP, 2015). When Malawi gained independence in 1964, the country was still able to produce its full supply of necessary food. However, today this is not the case, and neither food production, nor food trade supply, provides enough food for the population. In the region, the lack of food has become almost a constant issue and the

number of under-nourished is permanently high. In Malawi, peace and economic stability have been disrupted by smaller domestic disturbances since World War II. Different international sources contemplate the reasons for this, though among them the clearly disastrous economic policies of the 20th century are mentioned as a cause for the living standard of the population to be one of the worst in the world. Food crises are not new phenomena here; reports note an unfavourable situation almost every time during the last many years.

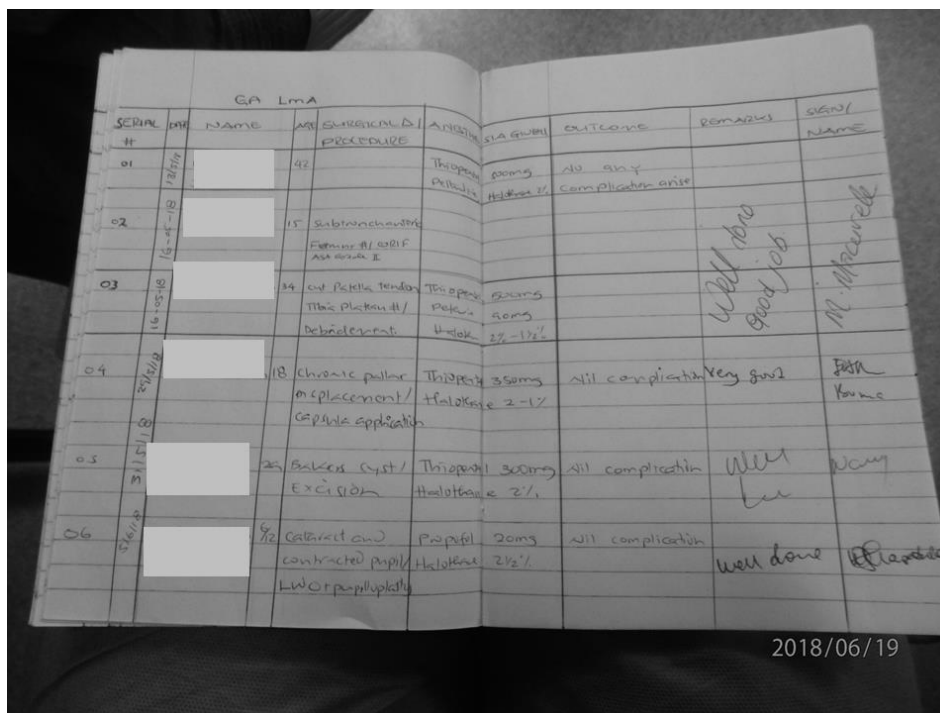
Medical Services in Malawi

Health care is divided into primary, secondary and tertiary levels of care. Primary care is generally composed of 68 dispensaries, 328 health centres, each with 5-10 beds and 16 maternity clinics. About 10-15 health centres feed into a district hospital, or mission hospital, which form the secondary level of care in Malawi. Not all districts have a government hospital and such gaps are met by faith-based mission hospitals. Each district or mission hospital has 100-200 beds and offers basic surgical services, such as trauma management and obstetric emergencies. Four central hospitals, each with the capacity of 600 – 1500 beds, form the tertiary level of care and offer more specialized medical and surgical treatments (Henry et al, 2015). The Queen Elizabeth Central Hospital in Blantyre, where the XIXth Medical Mission took place, was one of them (*Figure 2*).



Figure 2. – The Queen Elizabeth Central Hospital in Blantyre, Malawi with the members of the XIXth Medical Mission of the African-Hungarian Union, László Paput MD, Nelli Nepp MD, Éva Orosz MD, Csaba Loibl MD (left to right).

Malawi started a Medical College in 1991 to train medical doctors, but it still continues to face a chronic shortage of medical staff (Jiskoot, 2008). Due to the shortage of medical doctors, clinical officers (COs) represent the backbone of health care in Malawi. In 2007, Lavy et al. found that there were only 15 trained surgeons of any specialties in Malawi and there were no surgeons stationed at any district hospitals. In 2014, out of the 109 anaesthesia providers, 95.4 % were non-physician anaesthetists (Henry et al, 2015). Beginning in 1975, the country launched a three-year training program for COs. At the end of this training program, the candidate receives a Diploma in Clinical Medicine. After graduation, general COs complete a one-year internship at a district or a central hospital. During this period, they are being supervised by medical officers or by senior COs. To qualify for the annual registration of the Medical Council of Malawi (MCM), mandatory continuing professional development (CPD) courses, like for other healthcare staff, are required (Henry et al, 2015). As most anaesthetic procedures in Malawi are performed by COs, the Malawi School of Anaesthesia has begun qualifying Anaesthetic COs since 1988. Following the success of the above-mentioned generalist COs and CPD courses, medical assistants have become specialized Anaesthetic COs. During their qualification, they are obliged to document the anaesthetic procedure they performed (including general, regional and local anaesthetic procedures) in a logbook. In this logbook, not only the procedure and the demographic data of the patients must be registered, but adverse events (if any), the outcome, and the fact if the procedure was carried out alone or with the aid of a supervisor. At the end of each case, the remarks and the signature of the supervisor must be presented (*Figure 3*).



SERIAL #	DATE	NAME	AGE	SURGICAL D.I. PROCEDURE	ANESTHETIC	GA DRUGS	OUTCOME	REMARKS	SIGN/ NAME
01	12/1/19		42		Thiopental Petidol	300mg 100mg 2/	All ok complication arise		
02	16-04-19		15	Subbrachial Femoral III/GBIF ASA grade II				Well done Good job	M. Mphahlele
03	16-05-18		34	cut Pelvic tendon Tibia plateau II/ Debridement	Thiopental Petidol Urethane	300mg 50mg 2% - 12/			
04	27/1/19		18	Chronic pelvic misplacement/ cephalic application	Thiopental Halothane	350mg 2-12	All complication	Very good	Fern Koume
05	21/1/19		25	Baker's cyst/ Excision	Thiopental Halothane	300mg 2/1	All complication	Well done	Wany
06	21/1/19		42	Cataract on contracted pupil/ LWOP-pupilloplasty	Propofol Halothane	20mg 2 1/2/	All complication	well done	M. Mphahlele

2018/06/19

Figure 3. – Logbook sample of the Cos.

ENT in Malawi

“Prior to 2007, Malawi did not have a resident ENT surgeon or ENT service for its 14 million inhabitants and the burden of ENT disease was unknown. Malawi sent its first ENT specialist trainee to the University of Cape Town in South Africa in 2003; he returned to Malawi in 2007 as the first and only resident ENT surgeon. He is stationed at the southern city of Blantyre, where in 2008 he started up ENT services, training and research as part of improving teaching at the College of Medicine of Malawi, and the delivery of ENT services at its teaching hospital, the Queen Elizabeth Central Hospital.” (Mulwafu et al, 2014, p. 136)

When in Malawi AHU’s first general medical mission took place in 2014, it was Wakisa Mulwafu M.D. who still represented ENT as the only qualified and practicing surgeon. In 2016, one of the resident ENT doctors, Michael Ahoka M.D., got a 6-month-long scholarship from AHU and the University of Pecs. In 2018, Dr. Ahoka became the second qualified ENT surgeon in Malawi, finishing his studies in the Republic of South Africa.

The idea of the first ENT surgical mission was born during the inaugural general doctors’ mission to Malawi. One of the participants, Edina Pálinkás M.D., then a resident ENT specialist, was introduced to Dr. Mulwafu, who was the head of the ENT department at the Queen Elisabeth Central Hospital (QECH) in Blantyre, the biggest health institution in the country. Dr. Mulwafu explained that he was the sole ENT specialist in the country, which meant an approximate 1 to 16 million ratio. Dr. Mulwafu told Dr. Pálinkás not just about the hardships of the day-to-day running of the department, but also the opportunities that could arise from possible cooperation and the organisation of a surgical mission. Previously such missions had been organized to QECH with doctors from the USA and the UK. On her return to Hungary, Dr. Pálinkás raised the issue to the AHU, and with common interest and enthusiasm, the organization of the first surgical mission had started.

Materials and Methods

This article is based on the first-hand experiences of the authors who actively participated in the organisation and execution of medical missions. Thematic analysis of international literature was used to challenge and back up the findings of the authors.

Organising the Mission

To set up and manage a medical mission is a very complex task with numerous factors to address. The success of such a project depends not just on the many different participating experts (doctors, nurses, coordinators) and patients, but also on the many unforeseen aspects, incidents and events that do happen every time. While dangers are plentiful, people are still adamant about setting up and participating in these medical missions.



While there is a great need for medical attention all over the world, the major differences are in the quality of medical care provided and accessibility by the masses of people. This makes it inevitable that while in one part of the globe (mainly the developed countries) people have much better chances to retrieve a good quality health care; citizens of less developed nations often suffer from diseases that can be cured. Therefore, it seems perfectly justified that medical staff from developed countries are taking part in missions to deliver modern health care to people who otherwise could not receive such treatments.

There are a few key questions that an organiser needs to answer before starting the process:

- Is there a need for such a mission in the receiving country?
- Is there appropriate medical capacity (especially knowledge) in the sending country?
- Can a mission be beneficial for all parties involved?

Preparatory work in Hungary

Since 2009, the first doctors' mission, AHU has accumulated tremendous experience in organising such difficult operations. The usual method is always to keep advertising possible openings for doctors to participate in a mission and build up a database of available candidates. AHU has established that the ideal time frame of a surgical mission is around 2 weeks. That gives enough time for the doctors to have a positive impact in the receiving country and also this is an ideal length for the doctors to leave their practices in Hungary without risking falling behind. In the Hungarian headquarters, Ms. Zsuzsa Orzói, Head of Protocol, has coordinated this activity over the years. The planned size of each team is 6 people – 2 senior specialists with 2 resident specialists, an anaesthetic doctor and a coordinator. Ms. Orzói, with her colleagues Mr. Csaba Sélley and Ms. Kamilla Kiss, has also provided a training course for the volunteer doctors ahead of their mission. Over 2 to 3 afternoons, they covered subjects from security issues through introducing the destination country to different games (role/situation plays, quizzes) in order to prepare the participants. It was an important part of the pre-mission, as usually the team of doctors had only met each other for the first time on these occasions. It was crucial for the organisers to know that the doctors had a good connection and a “vibe” amongst them before embarking on these 3-to-5-week-long missions. Supporting others during critical times is a central component of medical missions.

The main commitments of AHU:

- AHU will screen Hungarian staff to make sure they are all qualified to participate;
- AHU informs applicants of all the mandatory paperwork and help them through the application processes (e.g. in Malawi all doctors who – even on a short voluntary basis – are dealing with patients need to register at the Medical Council that is a month long process at best);

- AHU provides applicants with all necessary information in order to prepare for them highly challenging tasks;
- AHU provides free training for all participants;
- AHU organizes medical camps in Malawi from beginning to end, including travel to and from, accommodation and catering, free time activities and assistance with any problems that might occur during the camp.

The main objectives of the XIXth medical mission were:

- to train the local medical staff – surgeons, clinical officers and nurses alike – to be able to perform advanced healing processes even without the help of the Hungarian doctors;
- to perform operations that could not be possible without the knowledge and expertise of the Hungarian medical staff;
- to donate much-needed medical equipment to certain Malawian healthcare centers;
- to establish connections between the Hungarian and Malawian doctors for further knowledge transfer via the Internet (email, chat applications, other electronic means);
- to find possible candidates in Malawi for Hungarian training in healthcare;
- to introduce the Hungarian doctors to a totally foreign environment with different type of health problems, especially knowing that the team had two resident doctors (who are medical school graduates and doctors in training).

Mission in Malawi

In the receiving countries, it is very important to establish strong connections with local health institutions, doctors and, not least, relevant government institutions. The role of the host doctor is exceptionally important. They can provide essential information ahead of the mission as well as build up a desired patient group, pre-examine the cases and set up an operating plan for the duration of the mission. Essential information is what human capacity is available locally, what the utilised medical equipment and pharmaceutical stock are. The local doctor can also help to secure the operating theatre with its equipment and local staff, both to ensure daily procedures and to provide opportunities for local medical people to learn while participating in the mission.

During the missions, it has become quite clear that it is preferable to have a person who both has local knowledge and also knows Hungarian, who therefore can be a good host who can understand the Hungarian medical staff and their needs. In Malawi, AHU established this connection through Csaba Szeremley who had been living in Malawi for several years as a businessman with vast knowledge of Malawi and a good network of local people both in healthcare and beyond. His tasks before the mission were to make sure all the required paperwork had been acquired on time for all the members of the medical team. This included



visa requirements and the registration at the Medical Council of Malawi. Further, if the doctors needed to bring medicine with them, it was then also required to report it to the relevant local authority. His duties were not exhausted by official arrangements only. A local expat can advise the missionaries on how to prepare themselves for the country they visit (climate, food, local customs, etc.). Nowadays it is very easy to get information from the Internet with a few clicks, however, the experiences and inputs of a known person weighs in stronger and can reassure participants on a different level. For the doctors to be able to perform to their highest standards, it was essential to provide a good atmosphere throughout the whole mission. That not only included secure accommodation, food and transport, but also programs for the evenings and weekends when Malawi's cultural and natural beauty were presented. While the doctors put all efforts into a successful mission, the local host organized different social events and visits to local sightseeing places for recreational and educational purposes. These activities let the doctors relax and recharge for the surgical duties, and furthermore help the mission's overall "marketability" for charming doctors to participate in the following missions (which is a really important factor for the organiser team).

The Queen Elisabeth Central Hospital, where the mission was headed in Blantyre, is the largest hospital in Malawi. It is also one of the few central hospitals with ENT and audiology departments and an ENT surgeon. The visits of several international doctors' teams to ease the burden laying on the handful of qualified medical staff are very important. However, a sustainable clinical service cannot be based on visiting specialists. These visiting doctors can play an important role in terms of training the local medical staff (surgeons, clinical officers, and nurses). As Fagan has expressed in his paper, having a permanent ENT service in a country such as Malawi provides an opportunity for improved international collaboration and may address logistical problems faced by otolaryngologists from developed countries who want to contribute to teaching and training in developing countries. (Fagan, 2012)

One of the main objectives of AHU's medical missions was to train the local doctors and nurses. This meant pre- and post-operational procedures, as well as training during surgeries. Working closely with the local staff had its difficulties. A main observation was that resident medical workers – both nurses, surgeons and resident doctors – had to be vigorously encouraged on a daily basis to actively engage with the work of foreign doctors.

Another significant purpose of medical missions is to highlight local medical issues, draw attention to them and try to facilitate sustainable programmes to tackle these problems. Foreign doctors with their experience can identify setbacks that local doctors might not be able to see themselves. Nevertheless, it is a common practice all over the world to bring in an outsider expert to try to solve matters. However, in these cases it is much more expected, as someone comes from a more developed workplace, who has already engaged with advanced practices, equipment and knowledge.

“Although much debate remains regarding the ethical obligations of surgeons who conduct mission trips in foreign countries, it seems certain from our experience that medical students who participate on such trips have invaluable educational opportunities. From patient care to resource allocation, medical students gain first-hand experience in relatively short periods. They develop skills of patient management along with an enhanced cultural sensitivity and sense of fiscal responsibility. With appropriate guidance and teaching, medical students gain experience that can positively influence their careers and shape their development into competent physicians.” (Gishen and Taller, 2015)

The Clinical aspects of the XIXth Medical Mission of AHU in Malawi

This operation was the fourth surgical mission, held between 11th and 27th of June 2018; the mission specialised in ENT and head- and neck surgery.

The members of this Medical Mission included 6 staff: four ENT doctors (two of them had their specialization exam in ENT), one doctor specializing in anaesthesiology and intensive care, and a coordinator. Due to an unexpected event occurring a few days before the departure, one of our ENT doctors had to stay in Hungary.

The present case report aims at discussing the details and the experience of the XIXth Medical Mission of the AHU from an anaesthesiologic perspective.

Anaesthesiology Policy

The essence of the applied anaesthesiology policy was that it should be simple and straightforward: using the available resources (drugs and equipment) in the perioperative period.

Airway – During the induction of general anaesthesia the “head-tilt, chin lift” and the “jaw thrust” manoeuvres – if necessary – were applied. For the preoxygenation / denitrogenation processes, face masks were used for both children and adults. When it was necessary, Guedel-tubes were used. In most cases for advanced airway management, enforced endotracheal (Woodbridge-type) tubes were used. For Functional Endoscopic Sphenoidal Surgery (FESS) or for Endoscopic Sphenoidal Surgery (ESS) procedures, cuffed oroendotracheal tubes were used with a throat pack. For paediatric cases, cuffed Woodbridge endotracheal tubes were available. The cuffs of the endotracheal tubes were inflated with a normal syringe, although no instruments to measure the cuff pressure were available. In case of a difficult airway, a stylet was inserted into the lumen of the endotracheal tube. Although gum elastic bougie was available, it never had to be used. Suction catheters were available all the time but the local practice was the use of Yankauer suction tips. Although laryngeal mask airway (LMA) was available in the Queen Elizabeth Central Hospital, due to the nature of the operations none of them were used.

Anaesthetic machine - For general anaesthesia, a Glostavent[®] machine was used (*Figure 4*). This machine has been designed to enable anaesthetists practicing in adverse conditions to overcome the difficulties they are likely to encounter. It consists of a draw over system with an Oxford Miniature Vaporizer (O.M.V.), combined with a Manley Multivent ventilator and an oxygen concentrator. The concentrator has been modified so that, in addition to oxygen, it can also produce air under sufficient pressure to drive the ventilator. It can be easily maintained and serviced using local skills and continues to function in the absence of soda lime, nitrous oxide, oxygen or electricity (Eltringham, 2003).



Figure 4. – Glostavent[®] anaesthetic machine.

Oxygen & other gases – Oxygen was delivered through pipelines from a central depot in the Queen Elizabeth Central Hospital. Oxygen cylinders for the anaesthetic machine were available too. Neither medical air nor nitrous-oxide was available, although the Glostavent[®] machine had a rotameter for medical air too.

Monitoring – The usual measurements of blood pressure, heart rate, peripheral oxygen saturation (SpO₂) and end-tidal carbon-dioxide (ETCO₂), the latter with a capnograph was used. Due to lack of equipment, no monitoring device for anaesthetic gas concentrations was available. All of these modalities were monitored out of the anaesthetic machine; the Glostavent[®] machine could measure the airway pressure only with a barometer.

Anaesthetic drugs – For the induction of anaesthesia, intravenous propofol 2% was used in a dosage of 0.1-0.3 mg/bwkg, depending on the patient's age and bodyweight. Intravenous thiopental was available too, but was not used. For inhalational induction and the maintenance of anaesthesia, Halothane was used. Propofol was administered only for the induction of anaesthesia, and due to lack of equipment, it was not used for Total Intravenous Anaesthesia (TIVA).

Analgesia – Intravenous fentanyl was available at the Queen Elizabeth Central Hospital. Despite its availability, for all cases, nalbuphin, diluted 20 mg in 10ml of normal saline was used and administered in doses of 0.1 – 0.3 mg/bwkg intravenously, titrated to the patient's current bodyweight. Given in small doses intravenously at frequent intervals, it was found to be effective in controlling pain and relieving anxiety. No problems were encountered with respiratory depression or with nausea and vomiting. Pethidine was available too for analgesia, but it was only used in adults to prevent postoperative shivering, if it was necessary. For this purpose, we used a dosage of 0.5 mg/bwkg intravenously. Non-opioid drugs were available from Hungary: diclofenac (75mg in 3ml) or metamizol (1g in 2 ml). These were used as part of multimodal analgesia in the perioperative period. For premedication, no analgetic drugs were given before any operations.

Antibiotics – For certain operations a single shot antibiotics dose was given. For this purpose, cefuroxime 1500 mg or amoxicillin & clavulanic acid 1200 mg were used. The antibiotics were given intravenously diluted in 10ml or 100ml of normal saline. Postoperative antibiotic treatment was to be defined by the operating surgeon. No allergic reactions were developed due to the administration of antibiotics.

Drugs for haemostasis – For this purpose iv. tranexamic acid (500 mg in 5 ml) or iv. etamsylate (250 mg in 1ml) were available, along with iv. calcium (1000 mg in 5 ml) from Hungary. Due to the special circumstances, we did not have any Prothrombin Complex Concentrate (PCC) or i.v. fibrinogen. Apart from the above-mentioned drugs, bleeding control was restricted to surgical haemostasis with monopolar electro catheter, and in case of transfusion full blood products were available only.

Muscle relaxants – From the local resources intravenous suxamethonium was available (100 mg in 2ml). For muscle relaxation at the induction of anaesthesia and during the operations, iv. atracurium (50 mg in 5 ml) was used from Hungary. Unlike our daily practice in adults (0.5 mg/bwkg at the induction and 10 mg if repeat is needed), an estimated dosage of 10 – 20 mg atracurium iv. during the induction was used, due to limited resources of non-depolarizing muscle relaxants. If repeat was needed an estimated dose of 5 – 10 mg iv. was used, depending on the situation. No other non-depolarizing muscle relaxants or Train of Four (TOF) monitoring were available during the medical mission. The estimation of the muscle relaxation was based on clinical signs (e.g., the patient's spontaneous breathing returned by detecting the movement of the balloon) or on the pharmacological features of the non-

depolarizing muscle relaxants. If it was necessary, atracurium was inhibited by the administration of iv. pyridostigmine (2.5 mg totally) and iv. atropine (1 mg).

Other drugs – Intravenous steroid (iv. dexamethasone 4 mg in 2ml) was available, it was used as an adjuvant drug for analgesia and for the prevention of postoperative nausea and vomiting (PONV). To prevent PONV iv. ondansetron (4mg in 2ml) was available from Hungary. In case of cardiopulmonary resuscitation (CPR), iv. adrenalin (1 mg in 1 ml) and iv. atropine (1 mg in 1 ml) were available. Iv. adrenalin was used as an adjuvant drug to lidocaine in the surgical field of the ENT surgeons. From local resources other drugs (e.g. diazepam, hydralazine) were available, but none of them were used by the medical mission's doctors.



Figure 5. – Pan endoscopy performed by Dr. Orosz in the Queen Elizabeth Central Hospital in Blantyre, Malawi.



Figure 6. – Foreign body removal performed by Dr. Nepp and Dr. Paput in the Queen Elizabeth Central Hospital in Blantyre, Malawi.

The medical mission performed 35 operations in two operating theatres. These operations included the following: mucocele 1, tympanoplasty 1, medial neck cyst 1, grommet insertion 1, tonsillectomy 1, lipoma excision 1, ESS (Endoscopic Sphenoidal Surgery) 5, oesophagoscope 2, direct laryngoscopy 3, adenotome 2, SND (Selective Neck Dissection) 1, total parotidectomy 4, thyroid lobectomy 8, total thyroidectomy 6 (*Figures 5 and 6*). Two cases were ASA 3, the rest of the patients were ASA 1 – 2. The relevant data of the patients were included in the ENT documentation, although no *per se* preoperative anaesthetic examination was done. Possible intubation difficulties had to be faced when the doctors met the patients in person, by checking the L-E-M-O-N (Look-Evaluate-Mallampati-Obstruction-Neck mobility) test (American Society of Anaesthesiologists, 2008). Interventions were done only after signing the informed consent by the patient or by their relatives. Paediatric anaesthesia was performed in four cases, the rest of the operations were on adults. In all cases, successful oroendotracheal intubations were performed as advanced airway management. No emergency coniotomy or tracheotomy was needed, and no endotracheal tube malposition occurred. Inhalational induction was done with Halothane for children. In adults intravenous induction was performed. No malignant arrhythmias were detected during the use of Halothane. After successful extubating and uncomplicated events, the patients were transferred to the recovery room (*Figure 7*), located next to the operating rooms. Transfusion of 2 units of full blood was needed in one case only. No patients were referred to the ICU after the operations performed by the medical mission's ENT doctors. No reoperations were needed among the cases operated by the medical mission's ENT doctors.





Figure 7. – Recovery room in the ENT Department in the Queen Elizabeth Central Hospital in Blantyre, Malawi.

Discussion

We found that organising a medical mission is a highly intensive and risky job. According to Roche et al. (2017), short term medical missions had been widely criticized for their risk to patients which is the fundamental starting point of any medical mission, namely to save and/or improve the life of sick people. AHU had managed to organize all of its doctors' missions in terms of successful surgeries conducted and both the local receiving team (including doctors, nurses, patients) and the travelling Hungarian doctors to feel productive about these missions. This is down to careful screening, selection and proper preparation of the Hungarian medical staff, as well as cautiously chosen destinations where felicitous circumstances and a well organised team waited for a joint cooperation. Another very important factor has been to put the travelling and receiving team in touch ahead of the mission. Through this connection, both parties could prepare themselves for the tasks. We established that the ideal length of a surgical mission is between 12 to 18 days, which gives enough time for a tangible result and allows Hungarian doctors to leave their work at home. During a mission a non-medical local guide, who is from the sending country (Hungary), had been proven to be essential in order for a mission to be highly successful and smooth. Besides securing a safe place, the guide can also organise extra activities to help relieve the stress of the medical staff.

Discussion of Anesthesiology of the XIXth Medical Mission

The anaesthesiology policy as described above was simple and conventional. As Halothane has not been used in Hungary since the 1990s, one of the lessons we learned was how to manage general anaesthesia with Halothane. As mentioned above, a Glostavent® anaesthetic machine is unknown in our everyday clinical practice; hence, this served as another valuable experience to learn how to work with this machine. The expensive and sophisticated 3rd and 4th generation anaesthetic machines which had been designed for “ideal” conditions proved to be unable to meet the harsh conditions (e.g. lack of electricity, lack of water) we encountered in the country. Despite special circumstances, no complications during the perioperative period occurred linked to our medical mission. Although English is one of the official languages in Malawi, most of the patients spoke the Chichewa language only. Language difficulties and the patients' fear of the operation procedure made our work more difficult to perform, but the aid of the medical staff of the Queen Elizabeth Central Hospital in the operating room worked toward our benefit.

Conclusion

AHU's medical missions had been proven to be needed and successful. It is based on the facts that one - from the receiving countries AHU has been getting ongoing requests for further missions, two – the number of volunteer medical professionals signing up for missions is not declining. Unfortunate international situations (Covid pandemic – travel restrictions – doctors being overwhelmed with work in Hungary) and some special logistic burdens within AHU's infrastructure have halted humanitarian medical missions organised by AHU since 2020.

In summary, we absolutely agree with the conclusion of Henry et al. (2015), who recommended further attention to training and professionalizing non-physician clinicians and their scope of work and increased involvement of surgeons and anaesthesiologists in training and working in Malawi. We can also conclude that despite challenging conditions, a successful cooperation between the members of the Queen Elizabeth Central Hospital's team and the medical mission's staff could be performed, which allowed us to carry out 35 uneventful ENT operations.

Conflict of interest

The authors hereby declare that no competing financial interest exist for this manuscript.

Notes on contributors

Dr. Péter Gergő Juhász graduated from the University of Nyíregyháza in 2002 with a degree in agricultural engineering. In 2006 he graduated as an environmental agricultural engineer at Szent István University in Gödöllő. Since 2007 he has been an entrepreneur. He has worked as a development consultant in Malawi, Mozambique, Swaziland, South Africa, Namibia and Zambia. In 2017, he obtained a PhD degree at the Doctoral School of Management Organizational Sciences at Szent István University. His research and publications focus primarily on food security in developing countries. He is the President of the Planetrise Association for Culture and Environmental Protection. With his scientific work, he has contributed to the development and operation of several humanitarian, environmental and agricultural projects in the Democratic Republic of the Congo, Kenya, Uganda, Rwanda, Zambia, South Africa and Malawi.

Csaba Loibl MD. obtained his university degree at the Medical School of the University of Pécs, where he received a general medical degree in 2008 with a "cum laude" qualification. From 2008 he became a part time student at the Faculty of Law of the University of Pécs. In 2010 he graduated as a medical lawyer with a degree in law. He spent his anesthesiology and intensive care resident training and specialist doctoral candidate years at the Institute of Anaesthesiology and Intensive Care of the Clinical Center of the University of Pécs, as well as at the Hungarian Defense Forces „Dr. György Radó Honvéd Medical Center”. In 2013, he passed the anesthesiology and intensive care exam with an "excellent" rating. He has been working as a specialist since 2013 and as a university assistant since 2015. He has been practicing his medical profession beside the Clinical Center of the University of Pécs, at the St. Luke's Hospital in Dombóvár, at the Mohács Hospital, at the Szigetvár Hospital, and as a missionary doctor in Malawi. He has participated in several domestic and foreign professional congresses, and is the first and co-author of numerous presentations, lectures, and professional publications.

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