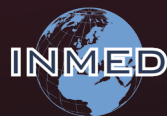

2017 HUMANITARIAN HEALTH CONFERENCE

"Holistic Partnership with the Forgotten"

Poster Presentation
Participants and Award Recipients

Hosted by the Institute for International Medicine, Graceway and ACIHE



Poster Presentations

Conference organizers welcomed participants to present posters of their completed and/or ongoing professional work during the 2017 Humanitarian Health Conference (March 24 - 25, 2017).

Poster Presentation Categories included:

- Global Health Education
- Research or Innovation
- Case Study

Special consideration was given to poster presentations that focused on the following topics:

- Impact of international rotations and experiences on students' and residents' development
- Providing public health services in communities with limited resources
- Clinical issues in resource-poor communities
- Sustainability implications for short-term international projects or partnerships
- Global Impact of medical mission
- Innovative approaches in global health
- Global health research

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Applying Emergency Medical Services Abroad: A Case Study of Developing an International EMS Fellowship Program

Charles T. Spencer¹ M.D., Chirakit Hengrasmee² M.D., Erica D. Carney¹ M.D., Paul Ganss¹ M.S., P. Charles Inboriboon¹ M.D.

Thailand, like many other developing countries, recognizes the paucity of a formal, well-training and organized Emergency Medical Services (EMS) system. Similar to the United States, motor vehicle collisions and ischemic heart disease constitute the largest proportion of sudden deaths in Thailand. An effective EMS system is one of the most vital components of this critical window in the patients' care. With different resources, financing, population demographics and cultural values, simply replicating an EMS system may not be appropriate for all countries. However, the United States has decades of experience, research and regulation of developed EMS systems that can be used to augment the development of less mature systems abroad. Currently, Thailand's formal EMS system is in its infancy. Ambulances are often staffed by nurses with little prehospital specific training or laypersons without formal medical training.

This presentation is a case report of an international EMS education and research fellowship developed to provide non-US Emergency Medicine (EM) physicians skills to implement a paramedic training program in their home country. The program was sponsored through an academic department of emergency medicine's global EM program and an EMS Paramedic program.

Key aspects of paramedic training included National Registry of Emergency Medical Technicians EMT and Paramedic certification as well mass casualty/disaster training, ATLS and HAZMAT certification. In addition, the fellow was engaged in educational activities including training of EM residents in skills workshops and through simulation. Successful completion, also involved completion of an EMS research activity in the United States.

After completing the fellowship program, the international EM fellow has returned to his home institution and is now the director of a paramedic training program. Ideally, not only will international fellows share knowledge and experience, they will develop sustainable relationships between institutions in the US and abroad that will benefit patients in both countries.

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Changes in Drug Transporter Proteins in Women with Viral Infections During Pregnancy Affect Placental Uptake of Nucleoside Analogs

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Mentor: Clifford Mason, PhD

Contributors: Gene Lee, Lily He, Helen Zhou, Carl Weiner

It is established that the placental barrier expresses several drug transport proteins that can modulate fetal exposure to antiviral drugs. The objective of this study was two-fold. First, we sought to determine how chronic HCV and/or HIV infections during pregnancy affect ABC and SLC drug transporter proteins in human placenta. Second, we sought to determine how ABC and SLC transporters regulate the transfer of direct acting antiviral drugs, specifically nucleoside analogs, in placental cells.

Placentas were collected from gestation age matched HCV infected women, HIV infected women, and healthy non-infected women at delivery under IRB approval from the University of Kansas Medical Center. Transporter expression was evaluated by qPCR and Western blot. To determine the role of transporters on the transport of nucleoside analogs, we incubated placental cells with chemical inhibitors of nucleoside transporters prior to the addition of radiolabeled nucleoside analogs.

Genes encoding nucleoside transporters (ENT1, ENT2, CNT2), ABC efflux transporters (ABCB1), and nutrient transporters (SLC19A1-2) were altered in placentas of women with chronic HCV and/or HIV. Intracellular accumulation of the nucleoside analog, Entecavir, was diminished in placental cells when uptake transporters were inhibited and increased when efflux transporters were inhibited. These interactions were not seen with other nucleoside analogs such as Tenofovir and Sofosbuvir.

The results indicate that changes in the placental expression of SLC and ABC transporters in women with viral infections could affect treatment options involving antiviral drugs. Furthermore, drug selection may affect fetal drug exposure in pregnancy complicated by chronic HCV and/or HIV.

Conflict of Interest Statements: None

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Clinical Challenges, Public Health Services and Community Outreach at the Methodist Faith Healing Hospital in Ankaase, Ghana

Shormeh O. Yeboah¹

Providing quality, evidence based clinical care in resource limited communities is wrought with multiple dynamic and unpredictable challenges to be overcome on a daily basis. Healthcare providers in these settings must adapt and improvise with what resources are available to try to ensure the best possible outcomes. This is very often a frustrating task, and unnecessary morbidity and mortality is common. In a rural hospital such as the Methodist Faith Healing Hospital (MFHH) in Ankaase Ghana, administrative challenges such as unstable funding sources to procure and maintain essential medications and equipment are a constant struggle, as are the specific policies and procedures involved in managing a hospital partially owned by the government. An additional challenge to clinical care is inherent in the ingrained cultural beliefs and reliance on “traditional medicine” that oftentimes delay appropriate care and cause additional morbidity and mortality. During my time at Ankaase, I witnessed these issues first hand and was educated in ways in which some of these challenges are overcome.

One strategy is community outreach and public health services which are very important functions of the hospital’s mission. The public health and psychiatry departments perform home visits and send teams out to the more remote and difficult to reach communities in the district whose residents would not otherwise have access to basic health care. Basic interventions such as providing immunizations, health education and counseling on nutrition, hygiene and family planning make small but significant impact in these communities. Finally, long term partnerships with international organizations provide essential support, however self-sustainable interventions must be emphasized.

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Developing Emergency Medical Services in Nigeria

N. Maxwell

Due to the lack of out-of-hospital care that was identified in Calabar, Nigeria, a program was designed in an attempt to train future out-of-hospital care providers. To do this, a scope of practice was created based on the primary emergencies faced in the community that was cognizant of the limited resources available. In efforts to have the program be self-sustaining, future teachers of the program were identified and equipped to lead and measures were taken to publicize the program including televised interviews, skills demonstrations, and meetings with the government and medical school staff. In the end, there were many successes indicating high potential for the future and a couple of lessons were learned that enabled us to do better as we continue.

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Development of Biligand Capture Agents to Target *Plasmodium falciparum* Histidine-Rich Protein II (PfHRP2) for Rapid Malarial Diagnostics

Anvita Mishra

Mentor: James Heath

Co-mentor: JingXin Liang

ABSTRACT: Currently, malarial rapid diagnostic tests use antibodies to detect *Plasmodium falciparum* histidine rich protein II (PfHRP2), a biomarker for *Plasmodium falciparum* malarial infection. Malaria caused by this species is the most dangerous form of malaria and has the highest rate of fatality. However, the antibodies required for these tests are too costly and too chemically unstable to be used viably in third world countries. Thus, the Heath lab is developing the technology for an antibody-free rapid malarial diagnostic test which will use peptide capture agents to target the entire PfHRP2 protein.

Macrocyclic peptides against distinct epitopes of PfHRP2 have been developed. We are aiming to develop capture agents with higher binding affinity than the monoligands in order to develop an accurate test with a low limit of detection. We want to increase the binding affinity of the capture agents by linking two PfHRP2 monoligands to create a biligand. In doing so, we want to test a cooperativity hypothesis to see if binding multiple sites on the PfHRP2 protein simultaneously with an optimized linker will yield better affinity. The PfHRP2 binding affinity of the biligands was evaluated and compared to the monoligands through colorimetric enzyme-linked Immunosorbent assays (ELISAs). I will describe in detail the procedure to synthesize these biligands, along with the process to find the best biligand binders for PfHRP2.

INITIATIVE TO ERADICATE MEASLES IN SOUTHERN AFRICA

Robynn A. Shines¹

Measles is ranked as one of the top four killers of children and most contagious diseases globally. Even though an effective vaccine exist, measles is still an active threat. In 1996, measles had been at large in southern Africa, and seven southern countries reached a solution to eliminate measles. This solution consisted of a nationwide campaign known as “Catch Up, Keep Up, and Follow Up”. The campaign required babies 9 months of age to get routine vaccines, children 9 months to 14 years of age were targeted to get vaccinated a second time and a follow-up every three to four years to prevent vulnerable transmissions. Last the campaign formed surveillance to prove suspected cases. Even though the importance of receiving the measles vaccine was exhibited through this campaign, politicians still needed to be convinced that it would be a good investment. Parents also refusing to vaccinate their children because of religious beliefs was also something the campaign had to tackle.

Overall, through the years the transmission of measles has decreased tremendously with only a few cases of outbreaks have happening over the years. The catch-up campaign lacks in certain areas, some areas they can control like the target population, and some areas that was uncontrollable like parent’s refusals. Measles vaccination is important and their needs to be continuous approaches to get people vaccinated. It is bigger than just a couple months’ worth of effort; it requires a consistent approach, committed government assistants, and many efforts from public health workers and the community. Age groups other than children should be targeted for the threat of measles to be reduced even more. It would be important for pregnant women to be targeted to get the measles shot, because of the high fertility rate in Africa.

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Kangaroo Mother Care: Barriers at Bwindi Community Hospital

Joshua Clutter, MD

During my 2 months in Uganda volunteering at Bwindi Community Hospital (BCH) I worked with the maternity staff to make Kangaroo Mother Care the standard. Although this low-cost, high-impact approach is not new to Bwindi it is not common practice. Kangaroo Mother care is a practice endorsed by the World Health Organization and has been proven to be beneficial practice to reduce both morbidity and mortality. During my time at Bwindi there were positive steps toward cultural acceptance of this established best practice, including skin-to-skin in the operating theater for the first time at BCH. Culture changes slowly but education seems to be a key step to integration of new practices. There is still much work to be done. My study of Kangaroo Mother Care and culturally sensitive implementation of best practices and experiences in Uganda can provide fodder for educationally beneficial discussion which is best displayed in a poster presentation.

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Prenatal Perspectives on Natural and Cesarean Deliveries in China

Mollyanne E. Gibson¹, Tomas Griebing²

Objective: To determine factors that correlate with a maternal preference for vaginal delivery.

Methods: 480 pregnant women completed a questionnaire at their prenatal appointments between June and July 2016 at Shanghai First Maternal and Infant Hospital in Shanghai, China and Yuyao Maternal and Child Health Hospital in Yuyao, Zhejiang Province, China.

Results: A preference for a natural delivery was indicated by 87% of subjects. Women with a college or graduate education were 4.51 and 17.89 times more likely to prefer a natural delivery than their counterparts with a middle school or high school education. However, women who reported that choosing the date of their child's birthday was important to them or to their family were 2.59 times less likely to prefer a natural delivery. The maternal preference for natural delivery was not correlated with the number maternal or parental siblings, maternal age, maternal concerns about pain during a natural delivery, nor the hospital where prenatal care was received.

Conclusion: The majority of pregnant women preferred a vaginal delivery. Higher educational attainment was protective for preferring a vaginal delivery. Valuing auspicious dates was a risk factor for not preferring a vaginal delivery.

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STUDENT RUN FREE CLINIC VOLUNTEER ATTITUDES ON INTERPROFESSIONAL CARE. T Phan (MD, SOM), M Baliga, J To, S Gordon, D Hecht, A Stahly, K Mader, J Johnson, L Vanderweilen, [University of Colorado, Denver, CO](#).

Presented by Bastman, J., Bulick, H., and David, A. with permission of authors

Student run free clinics (SRFCs) offer health services to underserved communities and unique education opportunities to students. Literature regarding the impact of volunteering at an SRFC on student attitudes is limited. We aimed to assess student volunteers' attitudes towards interprofessionalism at our local SRFC, the DAWN Clinic in Aurora, CO. DAWN is open two nights a week and staffed by students of various health professions with preceptor supervision. The clinic sees an average of 12 patients a night and offers flu shots, health education classes, and specialty consults (e.g. ophthalmology). DAWN sees a population that is 66.9% Hispanic, 19.3% Black, and 8.7% White and 93% of patients are uninsured. Student volunteers were surveyed before volunteering at DAWN and again after having volunteered for 1 year. Surveys were administered through RedCap from March 2015 to August 2016 and participation was anonymous and voluntary. Questions were adapted from the Readiness for Interprofessional Learning Scale, Student Perceptions of Interprofessional Clinical Education Revised, and Medical Student Attitudes Toward the Underserved surveys. 26 volunteers participated and following a year of service at DAWN, volunteers agreed or strongly agreed that learning with other students and professionals will make them more effective members of a health and social care team ($p = 0.04$). Volunteers also agreed or strongly agreed that trust and respect are required for successful small-group learning ($p = 0.02$). In conclusion, SRFCs positively impact student attitudes towards other professions and towards interprofessional care. Future work includes assessing the attitudes of a larger cohort of volunteers and also assessing their attitudes on underserved and primary care.

The Effect of Health Education in Preventing Morbidity Within the Native American Community

A. Davis

The Native American population within the United States suffers from high incidences of avoidable diseases and health problems such as obesity, suicide, alcoholism, diabetes, malnutrition, etc. The rate of morbidity is much higher on Indian Reservations compared to the larger population of the US. This can be attributed to the poor oral hygiene, mental health status, and nutrition of the population as proposed by Miguel A. Luquis. Literature points to the importance of maintaining health in these categories as well as others. A proposed way to do this is by educating the population not only on the importance of health, but also in ways to help maintain it. Research shows that health education is very important and has been included as major point in the Healthy People 2020 Campaign. While there are current opportunities for health education within the Native American Community, it is not widespread enough. There are many Indian Reservations in the United States that lack adequate access to healthcare or educational resources. By creating opportunities to educate the Native American population, we would hope to see a decrease in the incidence of morbidity within this population.

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The Impact of Household Water Treatment Systems on Growth Stunting in Patanatic, Guatemala

Jerrica Lynn Werner¹, Dr. Tarris Rosell, Ph.D., D.Min, M.Div.²

Water, Sanitation, and Hygiene, or WASH, projects are being implemented worldwide to help reduce the inequitable burden of disease. Poor WASH conditions are one of the leading causes of preventable illness and death in the developing world, and are the leading cause of diarrheal deaths of children, the second largest killer of children under five worldwide. The benefits of WASH projects in regards to diarrheal disease and death is well known and documented, but there is less evidence connecting WASH projects with growth stunting. Children with growth stunting are at a greater risk for illness and premature death, delayed mental development, poor school performance, reduced intellectual capacity, and feed into the intergenerational cycle of malnutrition, as small women are at greater risk of delivering an infant with low birth weight who is in turn more likely to be smaller as an adult.

Here we present the results of the impact of a household water treatment system project implemented in Patanatic, Guatemala by Woodland Public Charity, on the growth stunting of children aged 0 to 60 months over a period of five years. The evaluation consisted of household interviews, hand-washing practice observation, source and drinking water quality, and collection of height and weight data from a local health clinic. A total of 39 of the 282 families and their water sources were evaluated.

The investigation discovered 56% (22/39) of the community used water filters provided by the project for water treatment, 28% (11/39) boiled their water, and 10% (4/39) denied treating their water. At the time of testing, 72% (26/36) of the community had access to safe water (water with a negative coliform test) after treatment. The community as a whole experienced a relative 29% reduction in growth stunting. Families without access to a water filter experienced a 28% relative reduction, while families with a project water filter experienced a 50% relative reduction, resulting in a RR = 1.76. Families who were confirmed to have working filters experienced an 87% relative reduction, resulting in a RR of 3.04 when compared to the community at large.

These results indicate that water filter projects similar to the project implemented in Patanatic, Guatemala reduce the risk of growth stunting in families that receive water filters.

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2017 Award Recipients

Nick Williams

Developing Emergency Medical Services in Nigeria

Jerrica Werner

The Impact of Household Water Treatment Signs on Growth Stunting in Patanatic, Guatemala

Anvita Mishra

Development of Biligand Capture Agents to Target *Plasmodium falciparum* Histidine-Rich Protein II (*PfHRP2*) for Rapid Malarial Diagnostics



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