Faculty Report: Hearing Loss in Perinatally HIV-Exposed Children of Cape Town, South Africa

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Proposal title: Hearing Loss in Perinatally HIV-Exposed Children of Cape Town, South Africa
Country/ies visited: South Africa
Institution visited: University of Stellenbosch, Cape Town, South Africa
Dates of travel: 3/22/13-4/8/13
Number of student participants: 4
Previous IP proposals submitted and grants awarded
(list titles, countries and dates): Development of Speech, Language, and Hearing Science Student Exchange Program in Italy; Torino, Italy; 9/16/11-9/26/11
Establishment of Speech, Language, and Hearing Science Student Exchange Programs In the United Kingdom; Glasgow, Scotland; 11/25/08-12/1/08
Speech, Language, and Hearing Science Student Exchange Programs in the Scotland; Glasgow and Edinburgh, Scotland; 2/19/10-3/1/10
Have all required reports been submitted? Yes
Other funding for this activity available/applied for:

Proposal Abstract (75 word maximum):
This proposal requests support for travel to the University of Stellenbosch in Cape Town, South Africa to complete a faculty-led research experience in speech, language, or hearing sciences. Dr. Lebogang Ramma of the University of Cape Town could not be involved in this proposal. Subsequent contact was made with Dr. Barbara Laughton of the University of Stellenbosch and Tygerberg Children’s Hospital. This proposal was completed at that hospital with ongoing interest in this research project.
Travel report:

I. **Opening/overview of intentions/activity**
   The primary goal of this research project was to collect hearing sensitivity data as well as obtain language samples from South African children who were perinatally exposed to human immunodeficiency virus (HIV). Cross-sectional pilot data were obtained in HIV+, HIV-exposed but uninfected (HEU), and HIV-unexposed control children using a hearing examination protocol. The hearing protocol was: 1) otoscopy; 2) tympanometry; 3) pure-tone air- and bone-conduction audiometry; and 4) distortion product otoacoustic emissions (DPOAEs). A language sample was also a portion of this battery and will be used to assess the child’s speech and language skills, given the connection between hearing and speech and language. Questionnaires pertaining to hearing, speech, language as well as overall health were administered for the child and a health questionnaire of the mother also were administered. Risk factors for hearing loss will be evaluated. For HIV+ children, HIV disease severity variables such as plasma HIV RNA concentration (HIV viral load), peak viral load, CD4%, and treatment regimen will be examined for any associations with hearing loss. Language samples of each child were obtained using a digital video recorder. The effects of HIV exposure and other risk factors will be evaluated for a possible association with language development, based on questionnaire data and grammaticality of utterances in the language sample. This proposal will provide data on the potential communication difficulties that children who were exposed to HIV might have.

II. **In preparation for the trip abroad**
   The biggest hurdle we faced was that my original colleague, Dr. Lebogang Ramma of the University of Cape Town decided to withdraw from the project. Without including all of the details, Dr. Barbara Laughton of the University of Stellenbosch and Tygerberg Children’s Hospital in Cape Town agreed to collaborate with me. An important component that needed to be organized before we arrived in Cape Town was having the Audiology Clinic at Tygerberg Children’s Hospital get involved. After some discussions, two certified audiologists who were bilingual (English-Xhosa and English-Afrikaans) joined the research team.

III. **Upon arrival/specific activity**
   March 23, 2013 – Arrived in Cape Town, South Africa.

   March 25, 2013 – Our initial meeting with Dr. Laughton and the two audiologists. At this time we coordinated where certain aspects of testing would be completed, how the children would be moved between various locations within the study protocol, and we met the staff that would be assisting us throughout the study. We also met with the Executive Head of the Department of Paediatrics and Child Health, Dr. Mariana Kruger, to discuss the possible long-term collaboration between our universities. At the end of the day, we set up the equipment in advance of beginning data collection the next morning.
The research protocol included:
Questionnaires pertaining to hearing, speech, language as well as overall health were administered for the child and a health questionnaire of the mother also were administered; these questionnaires included HIV-specific questions when applicable. The hearing protocol was: 1) otoscopy, to evaluate the ear canal and tympanic membrane; 2) tympanometry, to evaluate middle-ear function; 3) pure-tone air- and bone-conduction audiometry, to evaluate the entire auditory system; and 4) distortion product otoacoustic emissions (DPOAEs), to evaluate cochlear function within the inner ear.
Risk factors for hearing loss (e.g., HIV status, age, sex, race, birth characteristics, maternal HIV status, and socioeconomic variables) will be evaluated. For HIV+ children, HIV disease severity variables such as plasma HIV RNA concentration (HIV viral load), peak viral load, CD4%, and treatment regimen will be examined for any associations with hearing loss.

A language sample was also a portion of this battery and will be used to assess the child’s speech and language skills, given the connection between hearing and speech and language.
Language samples of each child were obtained using a digital video recorder. The effects of HIV exposure and other risk factors will be evaluated for a possible association with language development, based on questionnaire data and grammaticality of utterances in the language sample.

March 29 to April 1, 2013 – The Easter holiday weekend, no data collection

April 2-5, 2013 – Data collection.
The research protocol as stated above was again implemented.

April 7, 2013 – Departed Cape Town, South Africa

IV. Conclusion, recommendation, and next step?
Cross-sectional pilot data were obtained in HIV+ (n=31), HIV-exposed but uninfected (HEU) (n=1), and HIV-unexposed control (n=15) children. These data will provide baseline for a subsequent longitudinal proposal on changes in hearing, speech, and language in children living in South Africa, who were perinatally exposed to HIV.
Since returning, all of the hearing pilot data have been statistically analyzed, whereas the language sample data will take much longer because the process is more involved. Specifically, a 3-5 minute language sample from one child will take approximately 10-12 hours to transcribe, code, and then complete reliability measures on. Given that we collected language sample data in almost 50 children, these samples will require substantial time before they can be analyzed. The hearing data, however, are currently being organized into multiple abstracts for submission to the World Society for Pediatric Infectious Diseases meeting in November 2013.
Furthermore, these data will also be used to support a grant application (RFA-MH-14-200 Integration and Analysis of Diverse HIV-Associated Data) to be submitted in August 2013.

V. Additional Information
None.

All information should be sent to The Office of International Programs via e mail:

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