

WASH and Vaccines: Progress Report

BRIEFING NOTE

June 2017

Rotavirus vaccine seroconversion and potential interference from Environmental Enteric Dysfunction: A comprehensive evaluation of diarrhea among immunized child populations in Zambia

Aim and objectives

This project builds on prior work at CIDRZ and seeks to:

- Evaluate the effect of serological markers of environmental enteric dysfunction (EED) on rotavirus vaccine seroconversion
- Document the prevalence of the top 15 enteric pathogens (viral, bacterial, and protozoal) among children <5 years with moderate-to-severe diarrhea and the influence of co-detection of these pathogens on the clinical features and severity of symptoms
- Determine prevalence of stool markers of EED
- Assess the association between environmental conditions and the risk of infection/co-infection as well as vaccine seroconversion

Research Progress

Key progress on this project has been scored especially in terms of running pending laboratory assays. Currently, CIDRZ's post doc research fellow is attending training and running assays on the LUMINEX platform for characterizing the etiology of diarrhea in the study's cohort. Using this platform, researchers will simultaneously evaluate for the presence of multiple enteric pathogens via multiplex PCR. Specifically, evaluating the prevalence, clinical features, and molecular epidemiology of specific enteric infections in the cohort and the role of multiple co-infections on disease features and severity has begun. Researchers are also assessing correlations of the presence of EED markers in stool to clinical disease severity. They also plan to evaluate and compare the prevalence of these enteric pathogens in stool samples collected from control children without diarrhea. From the vaccine cohort, the study team have assessed the association between the presence of serological EED markers and seroconversion.

Further details on the results of the Gastrointestinal Pathogen Panel (GPP) was shared with SHARE partners in June 2017.

Achievement of key milestones, successes and challenges

Key milestones

- The protocol was finalized and ethical approval received
- Reagents for EED serum markers were ordered and received
- Samples have been sorted and assays are in progress for GPP
- Platform for analyzing EED markers in stool has been set and assay validation has equally been done
- Laboratory assays for stool EED markers have been done and results analysis is in progress
- Reagents for analyzing EED stool markers were ordered and have been received

Successes

- Laboratory assays for serum EED markers have been done and results analyzed. Preliminary results show that the overall prevalence of EED assessed by detection of any biomarker was at 90%, with Zonulin most prevalent at 82% and soluble CD14 was least predominate at 8%
- Research manuscript for serum EED markers has been written and submitted to PlosOne for peer review
- Attended the training in research Methods and Study Design in Mwanza, Tanzania
- Currently being trained on the GPP platform

Challenges

- Challenges in getting quotations from vendors since most reagents are ordered from outside the country. This has delayed laboratory assays
- Delays in having trainers from LUMMINEX due to delays in receiving the required reagents

RIU successes

- Project introductions were done and briefs were sent to stakeholders. Stakeholders expressed interest in receiving further updates as the project progresses
- CIDRZ presented on the WASH and Vaccines impact through the lens of rotavirus vaccines at the International Water Conference in October 2016



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