Loa loa microfilariae (mf) levels exceed 8,000 mf/mL and 30,000 mf/mL, respectively, implementation of ivermectin (IVM)-based elimination programs for lymphatic filariasis (LF) and onchocerciasis in areas where loiasis is co-endemic has been extremely problematic. Identifying those individuals "at risk" for such SAEs would allow them to be excluded from IVM community treatment and prevent SAEs. This strategy, termed "Test and not Treat" (TNT), relies on the development of a rapid field-friendly test to quantify *L. loa* mf in peripheral blood. To this end, we developed a mobile phone-based video microscope (CellScope-Loa) that automatically quantifies *L. loa* mf in whole blood in less than 2 minutes without the need for conventional sample preparation or staining. Between August and October 2015, a field evaluation was conducted in a health district of Central Cameroon to assess the performance of the Cellscope-Loa in comparison to examination of a calibrated blood smear (the current standard method to assess *L. loa* mf densities). Among the 15,298 participants, 226 (1.5%) had mf densities above 30,000 mf/mL, when assessed by calibrated thick smear. There was a strong correlation (rho=0.84, p<0.0001) between mf densities estimated by the CellScope-Loa and those measured by the calibrated thick smear. Receiver operating characteristic (ROC) analysis demonstrated that the CellScope-Loa could identify individuals harboring > 30,000 mf/mL with 94.0 and 99.6% sensitivity for CellScope-Loa thresholds set at 20,000 and 10,000 mf/mL, respectively. Most importantly, it had a negative predictive value (probability that the mf density is actually below 30,000 mf/mL) of 99.9 and 100% for the same threshold values. The TNT strategy based on the Cellscope-Loa is an extremely promising and practical approach to the safe implementation of large-scale treatment for LF and onchocerciasis in *L. loa* co-endemic areas.

1116

SYNERGY OF ALBENDAZOLE AND RIFAMPICIN COMBINATION THERAPY IN A MURINE INFECTION MODEL OF HUMAN LYMPHATIC FILARIASIS

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An estimated 120 million people are infected by lymphatic filariasis throughout the tropics leading to a profound public health and socio-economic burden in severely affected communities. Wolbachia is an essential endosymbiont of the filarial nematodes *Wuchereria bancrofti*, *Brugia malayi* the causative agents of lymphatic filariasis. Doxycycline is currently the gold standard for the targeting of Wolbachia in lymphatic filariasis chemotherapy. However, the current drug regimen is a 100-200 mg/day doxycycline dose given for 4 to 6 weeks to patients. The A·WOL consortium plan to reduce the current treatment time to 7 days or less to improve drug regimen adherence and to reduce drug resistance and costs of treatment. To achieve a rapid 7-day or less kill rate of Wolbachia, a number of drug combinations will be employed. These include different tetracyclines (Doxycycline and minocycline) rifamycins (Rifampicin or Rifapentine), Moxifloxacin as well as anti-helminthic drugs. The complexity of multiple drug combinations necessitates a rational approach in the identification and choice of the best treatments in in-vivo models and translating the animal treatments in the lab into clinical trials on the field. In this current study we apply a rational drug development approach using our on in our murine infection model of *B. malayi* and pharmacokinetic (PK) analysis to investigate the synergy of Albendazole and Rifampicin combination therapy on the macrofilaridal and anti-Wolbachia efficacy. Pharmacokinetic modelling and simulation allowed the administration of rifampicin dosages equivalent to a standard 10 mg/Kg or 600 mg dose or a 35 mg/Kg super-dose and albendazole equivalent to a 400-800mg clinical dose in our murine infection model of *B. malayi*, making drug exposure and efficacy results clinically relevant in comparison to traditional efficacy studies. We have found synergistic interaction between rifampicin and albendazole for both macrofilaricidal and anti-Wolbachia activities and have used PK analysis and parasitological methods to dissect the origins of these interactions.

1117

FACTORS PREDICTING TRANSMISSION ASSESSMENT SURVEY OUTCOMES FOR LYMPHATIC FILARIASIS

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National programs are progressing towards elimination of lymphatic filariasis (LF) as a public health problem. Nearly 300 transmission assessment surveys (TAS), population-based cluster surveys to determine whether prevalence has been lowered to a level at which mass drug administration (MDA) can be stopped, supported by USAID have been implemented in 14 countries. Since both failing TAS and continuing to implement MDA have financial and opportunity costs, TAS should be conducted at an appropriate time. A key question, which has not yet been analyzed using survey data, is therefore which factors increase the likelihood of passing TAS. We performed logistic regression analysis to examine whether the odds of passing TAS was related to baseline prevalence, number of MDA rounds implemented, or median epidemiological coverage. The analysis included data from 14 countries implementing 296 stop-MDA TAS between 2012-2015. Of these TAS, 90% of districts passed. We found that passing TAS was significantly associated with both baseline prevalence (OR 0.945, CI 0.915-0.976) and median epidemiological coverage (OR 1.044, CI 1.008-1.082) at alpha =0.05. While the number of MDA rounds was not significantly associated with passing TAS, it was important to control for as otherwise it confounded the relationship between baseline prevalence, median coverage, and passing TAS. The R-square value was low (0.0714), however; this indicates that this model does not include all of the factors that affect the likelihood of passing TAS. Ongoing analysis will incorporate additional factors that may affect the likelihood of passing TAS, such as vector species, diagnostic tests used to determine eligibility for TAS, and consecutive versus missed rounds of MDA, among others. These results confirm that it is important to achieve high coverage when implementing MDA, especially in districts with high baseline prevalence, and additional rounds of MDA may be necessary. National programs can increase the likelihood of passing TAS—and therefore achieving elimination—by implementing high-quality MDA throughout the program, rather than only in response to a failed TAS.

1118

THREE-DIMENSIONAL VISUALIZATION OF THE INTERNAL ARRANGEMENT OF ONCHOCERCAL (*ONCHOCERCA VOLVULUS*) NODULES USING HIGH-RESOLUTION MAGNETIC RESONANCE IMAGING

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Adult stages of *Onchocerca volvulus* live in subcutaneous or deep nodules. For descriptive biology or drug effect assessment purpose, the nodules are generally processed using either histology (fixation and section, followed by staining) or enzymatic digestion (incubation in collagenase to eliminate host tissue and isolate adult worms). Non-invasive detection of adult *O. volvulus* using ultrasound has also been used, but has little indications

because of the low optical resolution of the nodule content. None of these techniques enable to have a tridimensional view of how an onchocercal nodule is organized, and how the different worms arrange themselves relative to each other. Here, we had the opportunity to examine nodules using high-resolution magnetic resonance imaging (MRI). The nodules had been placed in a fixative just after their collection, and stored in the latter for about 20 years before the present study. To reduce the background noise and artifacts during image acquisition, nodules were immersed in Fluorinert FC-77 liquid, which is a proton-free fluid with low water solubility and similar magnetic susceptibility to the tissue. MRI experiments were done using a 9.4 Teslas apparatus equipped with a MAGNEX TS1276D, a Quadrature Volume Coils 400 MHz RF43 and associated with a VnmrJ Imaging acquisition system. 3D gradient echo images were acquired during14 hours with 100 ms repetition time, 4.44 ms echo time, 8 averages, a 30° flip angle, a 40 x 20 x 20 mm3 field-of-view and a 512 x 256 x 256 matrix. 3D reconstruction was processed using Myrian 1.21.1 (Intrasense, Montpellier, France) on the basis of DICOM data, in both Maximum Intensity Projection and average rendering modes. This study is a proof of concept that MRI can provide clear images of adult worms in onchocercal nodules fixed for many years. These results warrant further developments including adapted MRI coil and fine image analysis to assess the worm's viability. Studies could be conducted with recently collected nodules that have not been stored in a fixative, as well with small animals (rodents) naturally or experimentally infected with various filarial species.

1119

IDENTIFICATION OF NEW MACROFILARICIDAL COMPOUNDS FOR TREATMENT OF ONCHOCERCIASIS

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Current efforts to control and eliminate onchocerciasis are hindered by the lack of compounds that target the adult worm stage. In a joint collaboration with DNDi, academia and Celgene, a pipeline was established to identify macrofilaricidal compounds. To date, more than 400 compounds have been screened *in vitro* against *Onchocerca gutturosa* adults, identifying 120 compounds with EC_{50} <1µM 40 of which having EC_{50} <100nM. From this set of 400 compounds, a select set of 160 compounds were tested against both *O. lienalis* microfilariae and *Onchocerca gutturosa* adults, identifying 43 compounds with specific activity against the adult parasites *in vitro*. Active compounds with EC_{50} in the 0.015-1µM range and suitable pharmacological profiles were prioritized for *in vivo* testing. 23 lead candidates were tested by oral gavage in mice that harbored adult worms of the rodent filarial nematode *Litomosoides sigmodontis*. Two compounds significantly reduced the *L. sigmodontis* adult worm burden by 98 and 93% after 10 days of TID treatment and 1 day of BID treatment, respectively. Presence of microfilariae in the treated animals suggest that both compounds do not have a strong microfilaricidal effect. Current efforts to further assess the impact of both compounds on microfilariae in the *L. sigmodontis* jird model are scheduled. The current study demonstrates the successful establishment of a screening cascade which resulted in the identification of two promising novel macrofilaricidal compounds. The identification of such macrofilaricidal compounds which lack microfilaricidal effects are ideal candidates for the treatment of onchocerciasis, as they have a reduced risk for microfilariae-driven adverse events.

1120

COMPARISON OF THE ONCHOCERCIASIS OV16 IGG4 RAPID TEST AND OV16 ELISA AMONG CHILDREN IN TOGO: EXPERIENCES WITH A NEW SURVEILLANCE TOOL

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The Alere SD BIOLINE Onchocerciasis IgG4 rapid test (RDT) is a new field tool for on-site identification of antibodies to the Ov16 protein of *Onchocerca volvulus,* the parasite that causes river blindness. WHO recommends using Ov16 ELISA to decide when to stop mass treatment with ivermectin. In 2015, in preparation for a move towards onchocerciasis elimination, the Ministry of Health of Togo used the Ov16 RDT in a national survey to obtain preliminary data on the prevalence of antibodies to Ov16 in school-age children and to compare Ov16 RDT to Ov16 ELISA. The survey was integrated with an NTD impact assessment. At each of 1126 schools serving as NTD sentinel sites, a convenience sample of 8 children age 6 to 9 years had finger-stick blood drawn for Ov16 RDT. A subset of children provided blood spots on filter paper (DBS) for testing by Ov16 ELISA. In total, 9007 children were tested by RDT, of whom 60 (0.7%) were positive. DBS were obtained from 2600 children. Ov16 ELISA testing is ongoing; of 294 RDT-negative samples tested to date, 50 of 294 (17%) were positive by ELISA. The significant discrepancy between RDT and ELISA results prompted additional investigations. Confirmatory Ov16 ELISA testing will be conducted at a US laboratory. The protein glutathione S-transferase (GST) is fused to the Ov16 protein. To assess whether Ov16 ELISA positives may be due to antibody cross-reactivity with GST, a GST-specific ELISA will be run on a subset of samples. To assess whether the RDT was properly conducted in the field, it will be repeated using the same DBS samples as for ELISA, using a modified protocol for testing DBS on Ov16 RDT. Application of the expectation maximization algorithm to our ELISA findings may improve classification of results. The 60 children who tested positive by RDT and a subset of those who are RDT-/ELISA+ will be revisited to document residency and travel history, repeat the RDT, and conduct skin snip testing with treatment if indicated. Resolution of these test discrepancies is important for onchocerciasis elimination in Togo. These findings highlight some of the challenges of employing these tests and our results should illuminate where pitfalls lie.

1121

DESIGN AND EVALUATION OF A HEALTH EDUCATIONAL BOARD GAME FOR THE CONTROL OF SOIL-TRANSMITTED HELMINTHIASIS AMONG PRIMARY SCHOOL CHILDREN IN ABEOKUTA, NIGERIA

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Despite repeated annual treatment with anti-helminthic drugs, soil-transmitted helminthiasis (STH) remains an important factor in school children morbidity in sub-Saharan Africa as school children are rapidly re-infected within 3 months after treatment. We designed a health education board game "Worms and Ladders" inscribed with health education and STH preventive messages and evaluated its potential for promoting good hygiene practices among school children for the integrated control of STH during mass drug administration (MDA). The evaluation employed a randomized control trial across six primary schools in Abeokuta, Nigeria. A total of 372 pupils were enrolled in the study, of which 212 were in the intervention group in three schools, and 160 were in the control group in three schools. Baseline knowledge, attitude and practices (KAP) relating to STH were obtained with a questionnaire followed by the collection