

cross-sectional analysis was performed to determine associations with Grade 1 or 2 nerve disability according to World Health Organization (WHO) criteria. Seventy-three patients were enrolled (73% male). The majority of patients had nerve damage with Grade 1 disability found in 19 (26%) patients and Grade 2 in 29 (40%). On univariate analysis, older age ( $p=0.048$ ) and lower education levels (OR = 5.4; 95% CI 1.4, 22.9) were associated with disability. Occurrence of reactions, clinical type of HD and other clinical and demographic variables were not found to be associated on preliminary analysis. Overall, our patients had a high burden of nerve damage consistent with prior studies in endemic areas. Additionally, older age and lower education were associated with disability grades of 1 or 2. While these findings are also consistent with other studies, overall data, to date, are limited and most of the literature has focused on clinical risk factors. These findings, along with planned multivariable analyses that may uncover other associations, will add to the body of knowledge on social factors associated with disability. This can then lead to strategies to target at-risk groups to reduce the burden of disease from this debilitating infection.

## 1705

### **NODDING SYNDROME/EPILEPSY IN THE SANAGA RIVER BASIN (CAMEROON): AN UNNOTICED EPIDEMIC?**

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Nodding Syndrome (NS) is a severely debilitating form of epilepsy affecting children between the ages of 5 and 15 years in Northern Uganda, South Sudan and Tanzania. Unconfirmed cases of head nodding have also been reported in Cameroon and the Democratic Republic of Congo. The cause of the disease is unknown and there is no cure. Evidence suggests that there is an association between epilepsy/NS and onchocerciasis. However, relevant factors for the development of the condition are urgently needed. In order to explore these further, ethnographic research was carried out in 5 villages in the onchocerciasis-endemic Mbam Valley of the Sanaga river basin, Cameroon. Participant observations, in-depth interviews, informal conversations and focus group discussions suggested that there was a sharp increase of epilepsy about 40 years ago. Reports from older residents (50 years +) showed that epilepsy was uncommon during the 1970's, and that its prevalence increased dramatically during the 1980's and has decreased in recent years. These findings suggest the existence of environmental or social triggers for the occurrence of epilepsy and potentially NS. Relevant factors may be: (i) the construction of dams upstream of the study area (affecting the seasonal population dynamics of blackflies, and increase the transmission of onchocerciasis); (ii) changes in the patterns of human-water contact; (iii) changes in climate (rainfall and temperature); (iv) changes in nutritional habits and the variety of foods available; (v) the annual mass ivermectin treatment through the African Programme for Onchocerciasis Control (APOC) launched in the late 1990's. These factors may be key in determining the reported sudden occurrence of epilepsy/NS and need to be assessed further to contribute to the identification of the causes and conditions under which NS develops and becomes epidemic in certain locations and at specific times.

## 1706

### **HELMINTHS AND UNDERNUTRITION: FACILITATORS OF MYCOBACTERIUM LEPRAE MORBIDITY OR INNOCENT BYSTANDERS?**

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While 30-50% of patients with Hansen's disease (HD) suffer from immunological Type 1 and Type 2 reactions that can lead to irreversible nerve damage, large gaps in knowledge exist about susceptibility to these complications. We hypothesize that helminthic co-infections and micronutrient deficiencies may be risk factors for reactions. Between July and December 2015, we performed a pilot case-control study at an HD clinic in Belo Horizonte, Minas Gerais, Brazil. Adult patients with multibacillary disease were recruited and were considered cases if they had an active Type 1 (T1R) or Type 2 reaction (T2R) or controls if free of reactions. Data were abstracted from the medical chart, and a demographic questionnaire was administered. Stool was collected for ova and parasite testing and venipuncture was performed for *Schistosoma mansoni* serology, complete blood count, C-reactive protein, Vitamin D level, and biomarkers for iron and vitamin A status. Statistical analyses were performed with adjusted odds ratios calculated for T1R and T2R as separate outcomes, controlling for age, sex, race socioeconomic status, rural residence, type of clinical HD, bacillary index, presence of anemia, other co-infections and smoking status. Seventy-three patients were recruited with 73% male and an average age of 51.2 years. Helminth infections were found in 4 patients with reactions and 1 patient without reaction, with total prevalence of 6.9%. Helminth co-infections were not found to be associated with T1R (aOR =3.5; 95% CI 0.17, 73.15) nor T2R (aOR = 0.07; 95% CI <0.001, 80.49). Micronutrient results are pending. While this pilot study did not show a statistically significant association with helminth infections and reactions, the total numbers of co-infections were small. Given the overall prevalence of low socioeconomic status, micronutrient deficiencies may play a role in the risk of reactions in our study. The nutrition results, future epidemiologic studies on co-infections in areas with higher helminth endemicity and immune studies hold promise in identifying strategies to reduce the significant morbidity of reactions in susceptible populations.

## 1707

### **CHITOSAN MICROPARTICLES TO DNA DETECTION IN URINE SAMPLES**

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Chitosan is the second most abundant natural polymer in nature, derived by partial deacetylation of chitin. Chitin is part of the support structure of many living organisms, such as arthropods (crustaceans and insects), mollusks and fungi. Chitosan is being widely studied because of their advantages of biocompatibility, high charge density and non-toxicity. During the last years, has been reported the use of chitosan particles has the ability of association to peptides, proteins, oligonucleotides, due to the abundance of amino groups in its structure, thus allowing adsorption. Urine is a valuable non-invasive sample, studies report the presence of DNA fragments in urine, however the low concentration is not detectable by conventional methods, an alternative is the use of chitosan biopolymer to concentrate the small amount of nucleic acids and their future application in the diagnosis of infectious diseases. We infected