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Case Report

Case Report: Soil-Transmitted Helminthiasis among School Children in a Mountainous Community

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Abstract: This case report utilized the primary data gathered from the extension program of the LORMA College of Medical Laboratory Science at the institution's adopted locale. Arosip is a secluded, difficult-to-reach mountainous barangay in the municipality of Bacnotan, in the province of La Union, Philippines. The study subjects were forty-one (41) kindergarten to grade three students of Arosip Elementary School. Modified Kato-Katz technique was performed to the submitted stool samples. Among 41 participants, nine were screened positive for the helminthic ova of *Ascaris lumbricoides*, and *Trichuris trichiura* – yielding a total of 21.95% prevalence rate. Among those 9 participants, 6 (66.67%) were positive for *Ascaris lumbricoides* ova, and 3 (33.33%) were co-infected with both *Ascaris lumbricoides* and *Trichuris trichiura* ova. The findings were relayed and reported to the local government unit. The team recommends for a more comprehensive screening and monitoring of STH cases in the locale, a continuous stewardship of health programs including mass-deworming for the school children and awareness campaigns, and provision of health resources. Ultimately, interagency collaboration between the Department of Health, Department Education, and Local Government Unit remains highly warranted to satisfy the health inequities experienced by this disadvantaged remote community.

Keywords: soil-transmitted helminthiasis; mountainous area; public health

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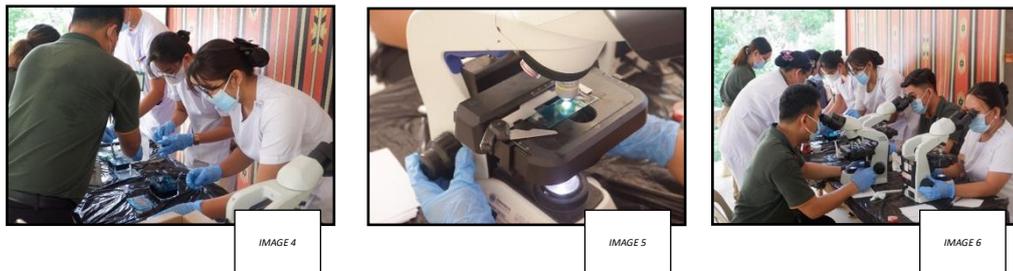
This case report utilized the primary data gathered from the extension program of the LORMA College of Medical Laboratory Science at the institution's adopted locale. The activity initially aimed to determine the prevalence of soil-transmitted helminths and identify their impact on community health.

Arosip is a secluded, difficult-to-reach mountainous barangay in the municipality of Bacnotan, in the province of La Union, Philippines. Its population as determined by the census was 629, which represented 1.42% of the total population of Bacnotan (Philippine Statistics Authority, 2020). The area is estimated to be at 368.7 meters or 1,209.6 feet above mean sea level, and approximately an hour away from the main road. Residents from these communities tend to be of low-income economic status and often experience disparities in health services utilization.

The study subjects were forty-one (41) kindergarten to grade three students of Arosip Elementary School, with varying genders and ages ranging from five to eight years old. The subjects were oriented on the proper collection methods and other necessary pre-analytical measures a day before stool testing. This is to preserve the maximum viability of the specimen. Submitted stool samples are then tested using a modified Kato-Katz technique – where microscopic examination of fecal specimens overlaid with hydrophilic cellophane soaked in a malachite green-glycerol solution was performed. Although in this study, the evaluation is purely qualitative, yielding only positive (parasite present) or negative (parasite absent) result, as quantification of eggs-per-gram was not done.



Images 1 to 3 shows the submission and preparation of stool samples for testing



Images 4 to 6 shows the conduct of the modified Kato-Katz, and subsequent microscopic examination



Images 7 shows *T. trichiura* ova (400x magnification)

Images 8 shows *A. lumbricoides* ova (400x magnification)

Several cases of soil-transmitted infections were identified during the screening process. Among 41 participants, there were 9 who screened positive for the helminthic ova of *Ascaris lumbricoides*, and *Trichuris trichiura* – yielding a total of 21.95% prevalence rate. Among those 9 students, 6 (66.67%) were positive for *Ascaris lumbricoides* ova, and 3 (33.33%) were co-infected with both *Ascaris lumbricoides* and *Trichuris trichiura* ova. Photomicrograph shows the characteristic peanut-shaped ova with bipolar mucus plugs of *Trichuris trichiura*, and a thick-shelled fertile and corticated egg of *Ascaris lumbricoides* showing multiple mammiliations on the outside vitelline shell and obvious signs of a developing larvae.

The findings were relayed and reported to the barangay health workers (BHW), and the principal, as well as the teachers of Arosip Elementary School. It was found out that the students have yet to receive their first dose of deworming tablets which were supposed to be distributed in January 2024 as part of the mass-deworming program of the government. The local government unit was also notified regarding the predicament of the students and is expected to schedule the distribution of the deworming tablets. To alleviate problem on sanitation and hygiene, the team conducted an STH awareness lecture for the school children (Image 9).



IMAGE 9

The team recommends scheduling a follow-up stool analysis and for them to receive their doses of deworming tablets. This is to monitor those students who have high parasite burden who need additional doses. Moreover, the school administrator must invest on setting up of additional and functional handwashing stations. Lastly, to further aid in the implementation of proper hygiene as a preventive measure in the spread of STH infections, it is recommended to set up accessible handwashing stations throughout the campus.

Discussion

Soil-transmitted helminthiasis itself is considered a neglected tropical disease that constantly plagues humanity even with the advent of urbanization and healthcare innovations (WHO, 2023). Unfortunately, STH cases from underdeveloped and remote mountainous areas often left untreated and undocumented (Tran *et. al.*, 2016; Nonaka *et. al.*, 2022).

The evident lack of knowledge, coupled with poor attitudes and practices, on the transmission and clinical manifestations of STH among primary school children of hard-to-reach and disadvantaged locales contribute to the prevalence of parasitism (Narkkul *et. al.*, 2022). Most of the residents are among middle to low status in terms of their socio-economic demography, which is proven to heighten their risk to STH infection and its consequent progression to a more severe and complicated state. Wattano *et. al.* in 2023 emphasized the relationship between socioeconomic status among ethnic minorities.

Due to its geographical location, it being elevated above sea level, a lack of a stable water supply is observed. This leads to a noticeable scarcity on the water supply used for both drinking and general household work. This entails that even though there is a handwashing station and comfort rooms within the vicinity of the school, the lack of water affects its utility. Other public health resources and facilities – including health workers, infrastructures, and medications were also deficient. Additionally, due to its far distance from the central district, inconsistent mass-deworming schedules by the local government is not done and poor access to a health facility by the residents were noted.

Health education sessions will significantly increase students' knowledge and awareness about soil-transmitted infections, empowering them to adopt healthier hygiene practices and reduce their risk of infection. Therefore, collaborations between different local stakeholders, including school authorities and health officials remains warranted. Implementation of public health policies and programs shall always be based on accurate and up-to-date empirical data obtained from research. This is to address the needs and demands of the community. This can be in a form of continuous health screening program, medical and dental missions, capacity building programs.

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