

POSSIBLE PUBLIC HEALTH IMPLICATION OF EXCRETA RE-USE IN POORLY SANITATED RURAL FARMING COMMUNITIES OF EBONYI STATE, SOUTHEAST NIGERIA.

Odikamnoru Oliver* P.O Box 329, Abakaliki E-mail: olivonne2007@yahoo.com

Ikeh Ifeanyi P.O Box 329, Abakaliki E-mail: drifeanyiikeh@yahoo.com

ABSTRACT

A quantitative risk assessment of helminth parasites was carried out among the rural population of some communities in Ebonyi state, southeast Nigeria to highlight the actual risk to public health affecting local farmers as well as consumers of crops grown on fecally polluted soil as a result of postharvest contamination with helminth eggs and larvae. Samples of soils from farm lands and stool from pupils in some public and private schools in izzi local government of Ebonyi state as well as fruits and vegetables bought directly from the local farmers were examined for helminth eggs and larvae using the zinc-sulphate flotation technique and microscopy, to highlight the public health significant of using untreated human excreta to fertilize farm lands. Out 1400 soil samples and 2400 stool samples examined, 32% and 60% respectively were positive. Eggs of *Ascaris lumbricoides* (15%); hookworms (11.8%); *Trichuris trichiura* (4%) and larvae of *Strongyloides stercoralis* (1.2%) were recovered from the soil. The stool samples contained *Ascaris lumbricoides* (30.4%); hookworms (20%); *Trichuris trichiura* (9.6%) and *Strongyloides stercoralis* (1%) respectively. All the fruits and vegetables were found to be contaminated. Proper sewage treatment remains a key issue in poor rural farming communities of developing countries.

Key words: Diseases, excreta, helminths, sanitation

INTRODUCTION

In Africa, more than half of the population does not have access to safe drinking water and about two-thirds lack good sanitary means of excreta disposal. Nigeria, like other developing countries is faced with the dilemma of inadequate disposal of excreta-related human waste discharged into the environment. Thus, in rural farming communities of southeast Nigeria, promiscuous defecation on open fields and farm lands is still a common practice. Excreta-related diseases especially helminths that cause gastrointestinal disturbances in man rank high on the scale of disease burden on the rural populace. Those most at risk of these diseases include children under 5 years of age as their immune systems are not fully developed and maybe further impaired by malnutrition (WHO, 1992).

Inadequate sanitation, lack of access to clean potable water and poor domestic hygiene are the cause of ~ 80% of all infectious diseases (e.g. cholera, typhoid, hepatitis, polio, cryptosporidiosis, ascariasis, and schistosomiasis) in the world and responsible for 10-25 million deaths each year, most them in the under 5 years age group. These diseases are mainly transmitted via the faecal-oral route through faecally contaminated water, food or soil

(WHO, 1989). Community studies show that the number of pathogens present in excreta varies as a function of health of the host and the local environment (Schonning and Stenstrom, 2004). Communities characterised by poor hygiene and a large proportion of children will generate excreta rich in enteric pathogens. Helminth infections are of particular concern in developing countries and many of these parasitic worms have human hosts.

It is against these background that quantitative risk assessment of helminths parasites was carried out among the rural population of some communities in Ebonyi state southeast Nigeria to highlight the actual risk to public health affecting local farmers as well as consumers of crops grown on faecally polluted soil as a result of post harvest contamination with helminths eggs and ova.

METHODS

Study Area:

Ebonyi state occupies the area lying between coordinate 70 31` and 80 30` N and between 50 40`, and 60 45` E. The climate of the area is tropical and the vegetation characteristic is predominantly the rain forest with an average atmospheric temperature of 30⁰C. There are two distinct seasons, the wet and the dry seasons; the former takes place between April and October, while the latter occurs from November to March. The study was conducted in the rural communities of Izzi local government. The population here is made up of mainly small scale farmers. Sanitation facilities are either non-existent or grossly inadequate in the study area. Thus, defecation on open farm lands is a popular practice. These conditions furnish predisposing factors to many parasitic and other diseases.

Methodology:

1400 soil samples from farm lands and 2400 stool samples from pupils in some public and private schools in Izzi local government Ebonyi state as well as fruits and vegetables bought directly from the local farmers were examined for helminths eggs and ova using the zinc-sulphate flotation technique and microscopy.

Result and discussion:

Out of the 1,400 soil samples and 2,400 stool samples examined using zinc-sulphate flotation technique and microscopy, 32% and 60% respectively were positive. Eggs of *Ascaris lumbricoides* (15%); hookworms (11.8%); *Trichuris trichiura* (4%) and larvae of *Strongyloides stercoralis* (1.2%) were recovered from soil. The samples contained *Ascaris lumbricoides* (30.4%); hookworms (20%); *trichuris trichiura* (9.6%) and *Stongyloides stercoralis* (1%) respectively. Mixed infections were also common. All the fruits and vegetables were found to be contaminated with one or more species of helminth eggs, ova or larvae, with the fruits being more contaminated than the vegetables (52.9%) and (47.1%) respectively. *Telferiria occidentalis* (fluted pumpkin leaves) recorded the highest contamination rate (23%) while *Talinum triangulare* (water leaf) recorded the least contamination (8.3%). *Ananas cosmosus* (pineapple) recorded the highest contamination rate

(15%) while *Psidium guajava* (guava) recorded the least rate of contamination (5.6%) for the fruits. Helminth ova and larvae recorded were *Ascaris lumbricoides*, *Trichuris trichiura*, Hookworms, *Strongyloides stercoralis* and *Enetrobius vermicularis* with *Ascaris lumbricoides* being the most frequently encountered (60.3%).

These parasites affect human and animals and are directly linked to faecal contamination (Simonart *et al*, 2003). They are also linked to poor socio-economic conditions, so it is not surprising that poor communities in developing areas are characterised by a high prevalence of ascariasis. Especial care must therefore be taken when introducing sanitation technology that potentially increases contact between householders and excreta which may contain viable *Ascaris* ova. The risk of handling waste must be clearly identified and methods of reducing risk must be instituted wherever possible.

Helminth infections are of particular concern in developing countries and many of these parasitic worms have human hosts. According to O`Lorcain and Holland (2000), *Ascaris lumbricoides* is a highly infectious and persistent parasite that infects a quarter of the world`s population, with global estimates ranging between 800 and 1000 million people. *Ascaris lumbricoides* is one of the most significant human pathogens in sanitary waste, particularly in developing communities. Its importance derives from the fact that it has ova which are extremely persistent in the environment outside the host. An important source of exposure for humans to *Ascaris* ova exists in regions where excreta are used as soil conditioners or fertilizers, so that both the person handling the waste and those consuming unprocessed crops grown in these soils are at risk of infection (Faust *et al*, 1975).

Results from these studies showed that in these communities, a large amount of untreated human waste is discharged into the soil daily leading to the seeding of the soil with pathogenic organisms including geohelminth eggs and larvae. Sanitation, particularly, proper sewage treatment remains a key issue in poor rural farming communities of developing countries in the content of proper ecological sanitation.

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