

ASSOCIATION OF FACTORS ON PARENTAL KNOWLEDGE AND PRACTICE REGARDING ANTHELMINTIC DRUGS IN A TERTIARY HOSPITAL, SRI LANKA

Abstract: Worm infestations are one of the significant health problems affecting children in developing countries. It is highly prevalent among poverty-stricken communities due to poor hygiene. The objective of this study was to assess the knowledge and practice on anthelmintic drugs and the influence of selected factors and knowledge on worm infestation among parents of pediatric patients attending OPD at a Teaching Hospital, Sri Lanka. It was a descriptive cross-sectional study. A validated interviewer-administered questionnaire was used as a study instrument. A systematic random sampling method was used to select the 422 participants. The response rate was 79% (n=334). Pre-determined cut-off values used to assess the knowledge of worm infestation and knowledge on anthelmintic drug usage were 60% and 50%, respectively. Using these cut-off values, the level of knowledge was categorized as good and poor. Most of the participants were females (85.6%, n=286), and the mean age was 32(±5) years. 60.2% (n= 201) and 86.8% (n=290) had good knowledge on worm infestation and anthelmintic drug usage. Only 66.4% (n=215) of respondents used anthelmintics to their children as self-medication or prescribed drug. The age of the participants was statistically associated with anthelmintic drug knowledge (p<0.05). Knowledge of worm infestation could be further improved by educating the parents.

Keywords: Anthelmintic drugs, Worm infestation, Knowledge, Practice

Introduction

Intestinal worm infestations are a common global problem in the world. Intestinal worms are widely prevalent in tropical and subtropical countries. It mainly affects the most deprived communities having poor sanitation. Morbidity is directly linked with worm burden, where greater the number of worms, the greater the severity of the disease. Intestinal worm infestation is caused by eating undercooked meat from an infected animal, consuming contaminated water, consuming soil contaminated food, contacting contaminated feces, poor sanitation, and poor hygiene. The common symptoms associated with intestinal worms are abdominal pain, diarrhea, nausea, vomiting, weakness, and unexplained weight loss (WHO, 2020). The common intestinal Helminthes in the world are roundworm (*Ascaris lumbricoid*), whipworm (*Trichuris trichiura*), and hookworms (*Necator americanus* and *Ancylostoma duodenale*). According to the worldwide estimation in 2010, approximately 820 million persons were infected with *A. lumbricoides*, 460 million with *T. trichiura*, and 440 million with *A. duodenale* or *N. Americanus*. As a developing country with a warm, wet, tropical climate Sri Lanka is endemic for all three intestinal worm types, excluding *A. duodenale* (De Silva, 2018).

Children are unshielded for certain diseases, and it increases morbidity and mortality rates. These diseases comprise diarrhea, vector-borne diseases, helminthic infection, respiratory infections, and injuries (Prathaban, 2010). Worm infestation mainly occurs due to a deficiency in sanitary facilities,

hazardous human waste disposal systems, the inadequacy of safe water supply, and low socio-economic status. Intestinal worms can contaminate through ingestion of parasite eggs or skin contact with motile larva. The groups at risk are pre-school children and school-aged children. These infections produce adverse effects on health, growth, and learning ability with a reduction in physical fitness and impaired memory and cognition. (Nath, Padmawati and Shafiul, 2018)

The universal strategy for addressing the intestinal worm infestation is mass deworming with anthelmintic drugs periodically administered to school-aged children and other high-risk groups (Andrews, Bogoch, and Utzinger, 2016). Deworming is not the only solution; however, upgrading basic hygiene, sanitation, health education, and providing access to safe drinking water are also keys to settle the nutritional problems raised by intestinal worms (WHO, Department of Nutrition for Health and Development).

Anthelmintic drugs are indicated in the treatment of worm infestation. The drug recommended for intermittent deworming includes Levamisole, Mebendazole, Albendazole, and Pyrantel Pamoate. However, Benzimidazoles such as Albendazole and Mebendazole are the most commonly used anthelmintics. Albendazole and Mebendazole have a very similar mode of action and very similar efficacy after a single administration (Keiser and Utzinger, 2008).

Deworming aims to reduce initial worm load by less than 80%, eliminate the disease, and repeat treatment is essential to prevent heavy loads from being re-accumulated (Hall and Horton, 2009). According to the guidelines for deworming children and pregnant women in the community setting during 2013-2016, the country was divided into high-risk areas (Uva, Sabaragamuwa, and central provinces) and moderate risk (all other provinces). The guidelines recommend that all children in high-risk areas be treated twice a year with a single dose of Mebendazole (500mg), while children in moderate risk areas should be treated once a year (WHO, 2004).

The people of Sri Lanka have inaccurate beliefs about the transmission and treatment of worm infestations. It leads to the over usage of anthelmintic drugs. (Perera et al., 2012). In Sri Lanka, only a few studies were conducted on the knowledge and practice regarding worm infestation and deworming. This study aims to assess the knowledge and practice regarding anthelmintic drugs among the parents of pediatric patients admitted to Teaching Hospital, Jaffna, and identify the influence of social demographic factors and knowledge on worm infestations on them. Assessing their knowledge and practice on Anthelmintic drugs is beneficial in averting worm infestation among children.

Methodology

Study Design

It was a hospital-based descriptive cross-sectional study among the parents attending Outpatient Department (OPD) and OPD pharmacy, pediatric counter of Jaffna's Teaching Hospital. Data were collected via an interviewer-administered questionnaire that lasted 15 minutes.

Study setting and sampling

According to the study conducted in Sri Lanka (Perera *et al.*, 2012), out of 200 mothers, 55.3% gave anthelmintic treatment every 6 months. Thus, the proportion value was taken as 0.553. The sample size was calculated from According to the study conducted in Sri Lanka (Perera *et al.*, 2012), out of 200 mothers, 55.3% gave anthelmintic treatment the formula: $n = \frac{Z^2 p(1-p)}{d^2}$ where, n= sample size, Z=criteria value of specific confidence (95%), p= preliminary estimation of proportion of a given characteristics (0.553) and d= Acceptable amount of absolute error (0.05). The sample size was 380, and 10% non-responders' rate was expected. Finally, the sample size was 422.

The parents of pediatric patients attending the OPD at the Teaching hospital of Jaffna during the study period were recruited. The average number of pediatric patients under the age of 12 years attending the Out-Patients Department per month was 4500. The first patient's parent was selected randomly from the first ten parents of pediatric patients and continued with every 10th patient's parent via systematic sampling technique. Interviewer administered questionnaire was administered to every selected parent of the pediatric patient, and privacy was ensured.

Study instrument

An interviewer-administered questionnaire was used to collect data. The questionnaire was developed in English and validated by three experts. It was translated into Tamil and Sinhala by a language expert. The questionnaire consisted of three sections, namely A, B, C, and D. Section A was designed to collect data on the participants' socio-demographic and economic factors. It consisted of twelve questions. Section B consisted of questions regarding the knowledge of worm infestation. Section C and Section D consisted of questions about knowledge and practice on anthelmintic drug usage, respectively.

Data collection

Data collection was carried out among the parents after obtaining the ethical clearance from the Ethical Review Committee, Faculty of Medicine, University of Jaffna, and permission from the Director, Teaching Hospital Jaffna. Data collection was done among the parents of pediatric patients attending OPD at Teaching Hospital Jaffna.

Data analysis

The collected data were entered into SPSS 23 (Statistical Package for Social Sciences version 23). The research problems, specific objectives, and variables were analyzed. To assess the knowledge, a score was provided for each question of sections B and C. Each section B question shows that knowledge on worm infestation carried five marks for correct response and zero marks for correct or 'do not know' responses. A total of thirty-five marks was provided for this section. The knowledge level was categorized as "Good knowledge" and "Poor knowledge" with a cut-off value of 60% or above and below 60%, respectively. Section C knowledge on anthelmintic drug consisted of six questions, carrying 100 scores was categorized with a cut-off value of 50% as good and poor

knowledge. Findings of practice, section D was expressed in frequencies and percentages. The influence of associated factors on knowledge was determined by the Chi-square test, and 95% of the confidence interval was set for the test. With this, the result was significant if p-value < 0.05.

Ethical considerations

The research proposal was submitted to Ethical Review Committee through, Head, Department of Pharmacy, Dean, Faculty of Allied Health Sciences, University of Jaffna, and the approval was obtained to carry out this study. Permission for the data collection of this study was obtained from the Director, Teaching hospital, Jaffna. The purpose of the study was explained to the participants, and written consent was received.

Results

The response rate of this study was 79%. The majority of the participants were Females (85.6%) with a mean age of 32 (± 5) years. Sri Lankan Tamils (98.8%) following Hinduism (82.9%) were prominent among the Participants. More than half of the participants were housewives (58.1%) where a large proportion of the participant's spouses worked (89.2%). Educational qualifications of more than half of the respondents (53.3%) and their spouses (60.7%) were up to G.C.E A/L. Approximately half of the participant's (49.7%) salary was between 30 000 to 50 000 LKR. More than two-thirds of the participants were having a nuclear family (68.3%), and a nearly equal portion of the participants had one child (50.9%) and more than one child (49.1%)

Table 1: Distribution of socio-demographic factors of the study population (n=334)

Factors	Frequency	Percentage (%)
Relationship of the respondent to child		
Father	48	14.4
Mother	286	85.6
Age		
Below 30 years	143	42.8
30 and Above	191	57.2
Ethnicity		
Sri Lankan Tamil	330	98.8
Sri Lankan Muslim	4	1.2
Religion		
Hinduism	277	82.9
Catholicism	53	15.9
Islam	4	1.2
Occupation of Respondent		
Workers	140	41.9
Homemakers	194	58.1

Occupation of Spouse		
Workers	298	89.2
Homemakers	36	10.8
Educational Qualification of Respondent		
Up to G.C.E A/L	178	53.3
G.C.E A/L and Degree	156	46.7
Educational Qualification of Spouse		
Up to G.C.E A/L	203	60.7
G.C.E A/L and Degree	131	39.3
Family Monthly Income		
<30,000	138	41.3
30,000-50,000	166	49.7
>50,000	30	9.0
Type of family		
Nuclear	228	68.3
Extended	106	31.7
Number of children under 12 years		
One	170	50.9
More than one	164	49.1

Knowledge of worm infestation

More than half of the participants (62.6%) knew what the worm infestation was, and only one-fourth listed the names of worms (n=82, 24.6%) while 74.9% believed that earthworm causes harm to the children. 56.6% (189) knew that worms live inside the intestines. More than three-fourths (76.6%) mentioned that poor cleanliness is the cause of worm infestation. Also, they listed the modes of transmission of worm infestation as follows, drinking contaminated water (98.2%), Consuming contaminated food (99.1%), Poor hand hygiene (100.0%), walking barefooted (98.2%), and contacting with soil (100.0%). There were many signs and symptoms associated with worm infection, and an average of 79.28% was well informed regarding this. Itching around the anus (87.4%), abdominal pain (71.0%), loss of appetite (79.0%), body weakness (71.6%), and sleeping disturbance (87.4%). Everyone was conscious of the method of preventing the occurrence of worm infestation. On the whole, 60.2% (n= 201) had good knowledge of worm infestation.

Table 2: Distribution of knowledge of the participants regarding worm infestation (n=334)

Category	N	Percentage (%)
What is a worm infestation	209	62.6
Identifying one or more worm name	82	24.6
An earthworm is harmless to children	84	25.1

Place where worms live in the human body	189	56.6
Cause of worm infestation	256	76.6
Modes of transmission and route of entry of worm	328	99.3
Signs and symptoms of worm infestation	265	79.3
How can you prevent the worm infestation	334	100.0

Knowledge of the usage of anthelmintic drug

Table 3: Distribution of knowledge of the participations regarding usage of the anthelmintic drug (n=334)

Category	N	Percentage (%)
Name of the drug	308	92.2
Frequency of taking the drug	287	85.9
Available dosage forms	206	61.7
Taking the drug together with family	303	90.7
Repeating dose after 10 to 14 days	227	68.0
Not to be used for children under one and a half years	300	89.8

A significant number of participants (92.2%) named the drug they used, and 85.9% knew the interval of taking the drugs. Regarding the dosage forms, 61.7% correctly mentioned the different dosages, while 25.4% gave partially correct answers. A substantial number (90.7%) of the participants knew that anthelmintic should be taken together by the whole family, and 68.0% were sure that the next dose should be repeated after 10 to 14 days. 89.8% of the participants were well versed that children under one and a half years should not be given anthelmintic drugs. Overall knowledge of participants on usage of anthelmintic drugs was good (86.8% n= 210). The age of the participants was statistically associated with anthelmintic drug knowledge (p<0.05).

Practice Regarding the usage of anthelmintic drugs

Among the participants, 215 (64.4%) respondents gave the anthelmintic drug to their children. The remaining reasoned that their children were below one and half years 106 (31.7%) and 13(3.9%) never deemed it necessary. The respondents administered the anthelmintic drugs in different time intervals like every three months 50(23.3%), every six months 63(29.3%), one year 13(6.0%), and whenever necessarily 72(33.5%). They followed both self-medication 149(69.3%) and prescription 100(46.5%). Participants followed with self-medication knew the dosage of the drug by their previous

experience. 211(98.1%) participants took the drug with their whole family, and 181(84.2%) repeated the doses after 10 to 14 days.

Discussion

This study focused on the knowledge and practice on the usage of anthelmintic drugs and the influence of selected socio-demographic factors and knowledge on worm infestation among parents of pediatric patients attending OPD at Teaching Hospital, Jaffna. The study was done among 334 parents. The mean age of participants was 32 ± 5 years with an age range of 21 to 44 years. More than half of the participants were above 30 years (57.2%), and most (85.6%) were mothers. It is in line with a study where most participants were mothers (81.22%) with a mean age of 30.47 (SD=5.47) years. (Aniwada et al., 2016). In contrast to a study where 23.1% were above 30 years, 76.9% were below 30 years. (Amar et al., 2013). The majority of the participants (82.9%) were Hindus and Christians (15.9%). It is different from another study where 98.3% were Hindus and the remaining 1.7% Christian. (Amar et al., 2013).

In the present study, 60.2% (n= 201) of participants had good knowledge regarding worm infestation. In contrast, a community-based descriptive cross-sectional study conducted in selected slums of Pune city in India was manifested with average knowledge(75.0%), poor knowledge (22.0%), and good knowledge (3.0%) regarding worm infestation. (Ray, Shine, and N, 2016). 62.6% of the participants mentioned worm infestation, which is lower than other studies in which 364 (88.8%) heard about worms, and 261(63.7%) knew about deworming. (Aniwada et al., 2016). In another study, 131 respondents (81.9%) heard about it. (Nath et al., 2018) Participants listed the different modes of transmission like drinking contaminated water (98.2%), Consuming contaminated food (99.1%), Poor hand hygiene (100.0%), walking barefooted (98.2%). Another study presents its finding, where 89(24.5%) of the parents knew that worms could be caused by walking barefooted (Aniwada et al., 2016)

It was found that participants knew that worm infestation caused itching around the anus and sleep disturbance (87.4%), abdominal pain (71.0%), loss of appetite (79.0%), and body weakness (71.6%). In another study, parents reported a similar thing, abdominal discomfort (67.9%), and identified that the pupil infected with the worm eats without gaining weight (52.5%)(Aniwada et al., 2016). It is incoherent to a study where participants reported pain abdomen (23.0%), perianal itching (19.6%), vomiting (23.0%), and worms in the stool (14.8%) as the signs and symptoms of worm infestations. (Amar et al., 2013). Another study suggested abdominal pain (31.5%), delay in growth (6.5%), itching in feet (4.0%), chronic cough (1.5%), abdominal distention (11.0%), hypopigmented patches (19.0%), sleepiness (13.0%) and vomiting (15.0%) (Perera et al., 2012).

In this study, 89.8% of parents believed that eating sugar can cause intestinal parasites in children's stomachs. 52.1% of participants mentioned eating sugary foods as a significant cause of worm infestation. Also, 158(43.3%) believing that it can be contracted through eating sweet foods. (Amar et al., 2013). However, it must be noted that it is an entirely misplaced belief. The fact is that intestinal parasites can invade the child's body regardless of the amount of sugar the child consumes. Many participants mentioned that consuming contaminated food (99.1%) and poor hand hygiene (100.0%)

were the cause of worm infection. It was found low in another study where participants reported eating food contaminated with soil (1.7%) and eating with unclean hands (10.3%). (Amar et al., 2013). In contrast, mothers mentioned swallowing parasite eggs (67.0%), piercing the skin (6.0%), playing with sand (51.0%), eating sweets (38.5%), poor general hygiene (18.0%), and eating raw scraped coconut (5.5%) might cause worm infection. (Perera et al., 2012). In a study, 64.9% of mothers reported hand washing before eating and feedings, 58.1% notified hand washing after defecation, 57.2% regular use of footwears by self and children, 83.0% reported maintaining food hygiene, and 40.2% practiced sanitary latrine to prevent worm infection of their children. (Amar et al., 2013). It was dissimilar to our study, where the total population had complete knowledge of preventive methods.

This present study revealed that most of the study participants (86.8%) had good knowledge and others (13.2%) had poor knowledge of anthelmintic drug usage. About (91.3%) participants knew about the drug used to treat the worm infestation, and (86.3%) of respondents knew about the drug's dosage. The study was conducted in residents of Jos, Plateau State, Nigeria, where (70.4%) respondents knew about the drug and (96.2%) of respondents knew about the dosage of the drug (Jimam et al., 2013). More than half of the respondents, 215 (64.4%), gave the anthelmintic drug to their children, and 106 (31.7%) respondents skipped giving the drug to their children as they were below one and half years of age. It was found to be high in a study; 168 (84.0%) reported giving routine anthelmintic treatment to their children (Perera et al., 2012). Anthelmintic drugs were recommended for children above 18 months of age. (Deworming guideline, 2012).

Out of the 215 respondents, 23.3% used the drug every three months, while 29.3% used it after six months. A significant number of participants gave anthelmintic treatment every three months (39.3%) and every six months (55.3%) (Perera et al., 2012). According to prescription, nearly 69.3% of the respondents used the anthelmintic drug as self-medication. Most of them (98.1%) took the anthelmintic drugs with all the family members, and 84.2% of respondents repeated the dose after 10 to 14 days. Similarly, a cross-sectional study was done in the suburban area of Sri Lanka, where (84.0%) respondents reported giving routine anthelmintic treatment to their children. Only 30.0% had a repeat course after 10 to 14 days. Among them, 70.5% of respondents obtained the anthelmintic treatment from their general practitioner, and 80.5% received treatment without a prescription (Perera et al., 2012).

Conclusion

The study's findings state that 86.8% (290) had good knowledge of the usage of anthelmintic drugs and 60.2% (n= 201) had good knowledge of worm infection. Around 64.4% of respondents administered anthelmintic drugs for their children, and among them, nearly 67.4% of respondents used it within one year. Of the children who received routine anthelmintic treatment, 98.1% took with the whole family, and 84.2% had a repeat anthelmintic course. Overall, knowledge was good on the usage of the anthelmintic drug. However, the level of knowledge of the remaining participants can be improved by frequent education and counseling.

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