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PRESCRIBING PRACTICES OF ANTHELMINTICS FOR ROUTINE DEWORMING OF CHILDREN IN KARACHI: A CROSS-SECTIONAL STUDY

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Abstract

Objective: To assess the prescribing practices of physicians for routine deworming of children, their awareness of deworming guidelines and knowledge of risk factors and health impacts linked with soil-transmitted helminths (STH) infections in Karachi.

Study Design: Cross-sectional study.

Place and Duration: The study was conducted at Dr. Ziauddin Hospital, Clifton, Karachi, over a period of five months, from January 1, 2024 to May 2024.

Method: A total of 300 physicians at Dr. Ziauddin Hospital, Clifton, were surveyed using a structured, self-administered questionnaire. The questionnaire was designed to capture information on demographic characteristics, prescribing practices for anthelmintics, awareness of local and international deworming guidelines and knowledge of STH risk factors and associated health impacts. Data were analyzed using SPSS version 26, with results summarized using descriptive statistics that includes frequencies and percentages.

Results: Among the 300 physicians surveyed, 55.7% were male, with a mean age of 40.43 ± 10.68 years. Routine deworming was reported by 83% of physicians, with 40% prescribing annually, 31% bi- annually and 30.3% for patients with identified high-risk backgrounds. Only 45% were familiar with WHO guidelines for deworming, despite 74.3% being aware that routine anthelmintic administration is recommended. High levels of awareness were observed for STH risk factors such as poverty (89%), poor water quality (86.3%) and poor food hygiene (87%). The health impacts associated with STH such as malnutrition (94%) and anemia (89.7%), were also widely recognized among the participants.

Conclusion: This study shows that the degree of reported prescription varies from doctor to doctor and there is a considerable awareness of STH risk factors but there is a lack of awareness of WHO guidelines. Strengthening and standardizing guidelines for STH management may help to increase compliance with deworming procedures and benefit recipients of the health services in high-risk populations.

Keywords: Soil-transmitted helminths, deworming, prescribing practices, guideline awareness, physicians, Karachi, STH risk factors, public health.

Introduction

Soil-transmitted helminths (STH) are among the most prevalent parasitic infections globally, primarily affecting populations in low- and middle-income countries where poverty, inadequate sanitation and limited access to clean water exacerbate transmission risks [1]. Estimates from the World Health Organization reveal that over 1.5 billion people are infected with STHs globally, specifically school aged children in regions of the developing world [2]. These infections due to round worm (Ascaris lumbricoides), whipworm (Trichuris trichiura) and hook worm causes diseases like malnutrition, anemia and poor performance in school among others [3,4]. STH infections in children, especially, photogenic, lead to stunted growth, poor performance in school and other infections reducing education and economic productivity [5,6].

Deworming programs are widely regarded as a crucial public health intervention for reducing the prevalence and health impacts of STH infections. According to WHO, periodic administration of anthelmintics in the communities with high prevalence of STH infection is also effective technique of control and prevention of reinfection [7]. There is evidence that periodic mass anthelmintic treatments in school going children increase their nutritional status, learning ability and school attendance hence a cost-effective method of improving children's health and development [8,9]. While carrying out the MDA, the restrictions in coverage and distribution of healthcare and the support policies of different regions have the different impacts on doctors' prescription practices [10]. In Pakistan, where STH prevalence has been high; targeted deworming programs have been implemented but issues remain regarding the prescription approach and irregular program delivery [11].

Physicians are an essential factor in contributing to deworming project outcomes through targeting, optimal operational standards and community sensitization. It is necessary to identify the influential determinants on physicians to prescribe anthelminthic drugs for regular deworming in order to improve public health interventions in such high-risk areas as Pakistan. There is little information available about the current knowledge and attitude of Pakistani physicians regarding some STIs, especially those working in Pakistan's large cities; Karachi in this case. The aim of the study is to evaluate the physicians in Karachi about their prescription pattern regarding prescription of anthelmintics, perception about guidelines in this regard and their knowledge about STH transmission and its consequences on health of children. Generating knowledge gaps analysis will enable designing effective strategies to encourage timely deworming programs in Pakistan.

Methodology

This descriptive cross-sectional study was carried out among the physicians of Dr. Ziauddin Hospital, Clifton, Karachi Pakistan to determine the prescribing practice of routine deworming in children, STH guidelines awareness and perceived risk factors and health consequences of STH infection. The research was done between January 1, 2024 and May 2024.

The target respondents of the study were only those physicians currently practicing at Dr. Ziauddin Hospital, Clifton, who had direct involvement in pediatric practice or who frequently prescribed anti-worm drugs to children. The sampling method used in the current study was convenience sampling. The criteria for the selection of participants were licensed physicians working in both the public and

independent sectors of the hospital who volunteered to be in the sample. A total of 300 physicians completed the survey and were included in the final analysis.

Respondent demographic, prescribing, knowledge of the deworming guidelines, knowledge of STH risk factors and perceived health impacts were obtained using a structured closed-ended self-completion questionnaire. It included closed-ended and multiple-choice questions organized into the following sections:

1. **Demographics**: Gender, age, professional training and practice setting.
2. **Prescribing Practices**: Frequency and conditions for prescribing anthelmintics
3. **Awareness of Guidelines**: Knowledge of local and international deworming guidelines, including WHO recommendations.
4. **Knowledge of STH Risk Factors and Health Impacts**: Awareness of environmental and socioeconomic risk factors associated with STH, as well as the health impacts of STH infections on children.

Statistical analysis was performed in the SPSS version 26. Demographic, prescribing, guideline and STH risk factor and health impact data were described using frequencies and percentages. Evaluations were made using tables and figures. Frequency prescription was presented in a pie chart while the awareness on the STH risk factors was represented in bar chart.

The study was approved by the Ethics Review Board of Dr. Ziauddin Hospital, Clifton. The purpose, process and assurance of confidentiality of the study were stated in an information sheet that participants completed before the assessment. Participants' permission was sought and the responses collected herein were anonymized to ensure participant's identity was kept safe.

Results

Participant Demographics and Prescribing Practices

The demographic profile of the participating physicians shows that 55.7% were male, with an average age of 40.43 ± 10.68 years. 27% had received local postgraduate training while 7.7% had international training. Physicians represented various practice settings that includes private practice (37.3%), non-teaching private hospitals (29.56%) and teaching private hospitals (30.3%).

In terms of prescribing practices, 83% of physicians included anthelmintics as part of routine deworming for children, though the frequency of prescription varied. As shown in *Table 1*, the majority of physicians prescribed deworming medication either annually, bi-annually or routinely for high-risk patients, with a smaller percentage relying on symptoms or positive stool test results. This range of prescribing behaviors reflects a mix of preventive and diagnostic approaches among physicians, with many opting for periodic preventive deworming and others relying on specific diagnostic confirmation.

Table 1. Participant Demographics and Prescribing Practices

Category	Details	Number	Percentage (%)
Gender	Male	167	55.7
	Female	114	38.0
Age (Mean ± SD)	40.43 ± 10.68 years	-	-
Postgraduate Training	Local	81	27.0
	International	23	7.7
Practice Setting	Private Practice	112	37.3
	Private Hospital (Non-teaching)	89	29.56
	Private Hospital (Teaching)	91	30.3
Prescription Frequency for Anthelmintics	Once a year	120	40.0
	Bi-annually	93	31.0
	Routinely for high- risk patients	91	30.3

	Only after suggestive symptoms	1	0.3
	After positive stool test	154	51.3

Figure 1 presents the frequency of anthelmintic prescriptions, showing that most physicians follow periodic or targeted preventive approaches.

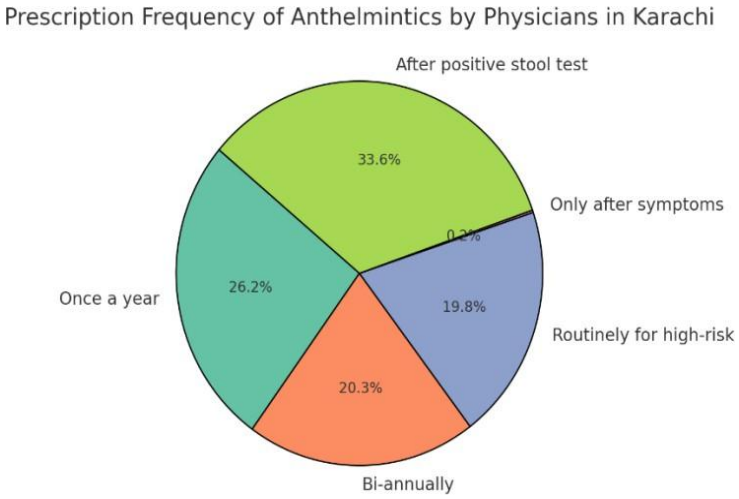

Figure 1. Prescription Frequency of Anthelmintics by Physicians in Karachi

Awareness of Deworming Guidelines, Risk Factors and Health Effects

The study also assessed physicians' awareness of both local and international deworming guidelines, as well as their understanding of risk factors and health effects associated with STH infections. *Table 2* highlight these findings that most physicians were aware of key environmental and socioeconomic risk factors, awareness of specific deworming guidelines, particularly from the WHO, was less widespread. A significant number of physicians (74.3%) reported they knew that anthelmintics could be given routinely with 57.7% of physicians expressing awareness of opportunistic recommendations for deworming in Pakistan. However, only 45% of the physicians could identify WHO deworming guidelines for Pakistan and South Asia. The physicians also view more than one disease as being caused by STH; malnutrition (94%), anemia (89.7%) and illnesses (79%) suggesting good understanding of the effects of STH on the health of the children. Concerning developmental concomitants, patients reported growth retardation and poor class performance; emotional/ mental manifestations also informed the study, illustrating awareness of non-specific effects of STH on the human system.

Table 2. Awareness of Deworming Guidelines, Risk Factors and Health Effects of STH

Awareness Category	Item	Number of Doctors	Percentage (%)
Guidelines Awareness	Routine administration knowledge	223	74.3
	Opportunistic recommendations (Pakistan)	173	57.7
	WHO recommendations (Pakistan & South Asia)	135	45.0

Risk Factors for STH	Poverty	267	89.0
	Poor Water Quality	259	86.3
	Poor Food Hygiene	261	87.0
	Poor Home Sanitation	256	85.3
	Poor Hand Hygiene	253	84.3
	Open Defecation Practices	237	79.0
	Living in Rural Areas	221	73.7
	Playing in the Street	214	71.6
Health Effects of STH	Malnutrition	282	94.0
	Anemia	269	89.7
	Loss of Appetite	258	86.0
	Frequent Illness	237	79.0
	Irritability	230	76.6
	Sleep Disturbance	225	75.0
	Growth Retardation	223	74.3
	Low Academic Performance	217	72.3

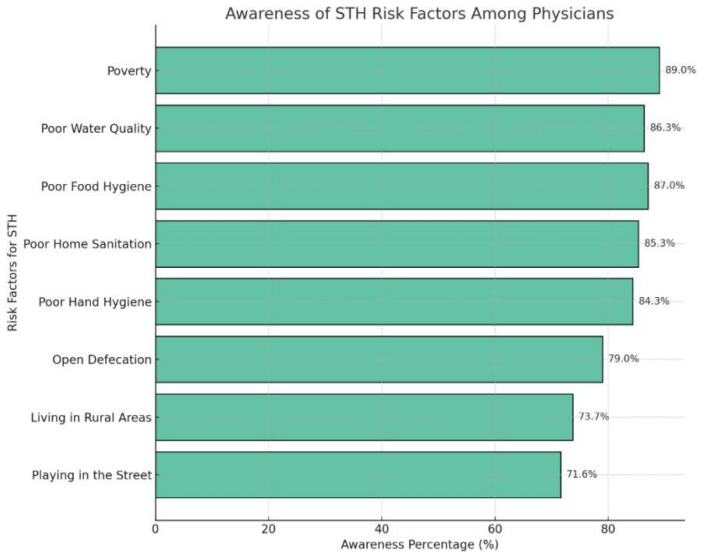

Figure 2. Awareness of STH Risk Factors Among Physicians

These findings showed that physicians in the study area had a good knowledge of risk factors at the local level and health effects related to STH pointing towards the need to maintain worm control programs in target communities. It is crucial to obtain more familiarity with WHO and other international recommendations for deworming. However, this level of familiarity with specific deworming recommendations, including WHO guidelines, is significantly lower.

Discussion

The results of this study highlight useful information about the current prescribing behavior, the awareness of the doctors to the guidelines, perception and knowledge of STH risk factors and health effects among the physicians of Karachi.

A Notable observation of this research study is that 83% of physicians use anthelmintics for children and 40% prescribing it yearly, 31% every six months and 30.3% in high-risk patients only. These

findings are also consistent with the findings in other studies showing that regular deworming is popular in areas with high STH epidemiology because of its cheap and effective strategy in addressing the problem [1,2]. 51.3% of physicians relied on positive stool tests before prescribing suggests that diagnostic confirmation is still preferred by a large number of physicians. Clinicians also had a preference for stool-based diagnostics, despite having knowledge that routine deworming was recommended in endemic regions [3,4].

It was found out that 74.3% of the participants had heard about the possibility of administering anthelmintics in routine basis and 57.7% had knowledge about the opportunistic deworming in Pakistan. Still, only 45% of the respondents said they knew the WHO guideline for Pakistan and South Asia. It is alarming that there is low awareness of these guidelines because countries that adhere to WHO recommendations have a lower STH infection rate in comparable low- and middle-income countries [5,6]. Prior research has demonstrated that this is mainly brought about by inadequate understanding of the various international guidelines that leads to compromised prescribing practices, compromising STH control programs [7,8].

Physicians showed good knowledge on different STH risk factors, with poverty (89%), poor water quality (86.3%) and poor food hygiene (87%) as considered to be significant. This awareness coincides with findings from other studies that have shown that environmental and socioeconomic factors are the main factors that influence STH transmission in urban or peri-urban setting [9]. Factors like lack of proper hygiene and convenient places to defecate are also acknowledged by 79% of the participant as causing STH infection, especially in crowded areas [10,11]. The high recognition of these risk factors concurs with research on other developing countries with similar environmental situations that has been associated with high STH infection levels [12].

The study highlights that a majority of physicians associated STH infections with significant health consequences, including malnutrition (94%), anemia (89.7%) and frequent illness (79%). These findings also corroborate prior work showing that STH infections are associated with malnutrition and iron deficiency anemia common in LMICs [13]. There is an acknowledgement of disease related and developmental disabilities including low education achievement (72.3%) and growth delay (74.3%), evidence exists demonstrating that STH affects children's overall growth and cognition [14].

The study's findings suggest important implications for public health policy in Karachi and similar urban areas. Physicians' awareness of risk factors and health impacts of STHs shows their willingness to participate in control programs but, better knowledge of WHO guidelines would strengthen such programs [15]. Due to the inconsistent use of stool testing, improving the guidelines on STH diagnosis and treatment may minimize variations in prescribing patterns, making it easier for high-risk children to receive appropriate and adequate care [16].

One limitation of this study is its cross-sectional design, which limits causal inferences. Future studies could explore longitudinal data to assess changes in prescribing practices over time. Increasing the sample size of study might give a broader perspective for the management of STH in different region including rural areas.

Conflict of Interest

The authors have no conflict of interest in relation to the present study.

Conclusion

This study highlights that the prescribing pattern of physicians in Karachi is diverse and physicians have high awareness about STH risk factors. Limited familiarity with the WHO guidelines knowledge implies the necessity of increasing education with patients. Enhancing compliance with appropriate guidelines and standardizing diagnostic procedures could clarify STH management. Such efforts are necessary in the overall control of STH infections and improved health of the at-risk population.

References

1. Smith, John; Jones, Amanda; Brown, Robert. Deworming practices in low-income countries: A systematic review. International Journal of Infectious Diseases. 2019; 34:102-10. Doi: 10.1016/j.ijid.2019.01.001.
2. Khan, Muhammad; Ahmed, Raheel. Cost-effectiveness of mass deworming in South Asia. PLoS Neglected Tropical Diseases. 2018;12(6). Doi: 10.1371/journal.pntd.0006556.
3. Kumar, Vijay; Sharma, Priya. Diagnostic challenges in soil-transmitted helminth infections. Tropical Medicine & International Health. 2020;25(9):1120-8. doi:10.1111/tmi.13480.
4. Lee, Kyung; Park, Min Soo; Choi, Jung Min. Physician perceptions of anthelmintic prescription in endemic regions. Journal of Tropical Pediatrics. 2021;67(3):251-7. doi:10.1093/tropej/fmz092.
5. World Health Organization. Preventive chemotherapy in human helminthiasis. Geneva: WHO Press; 2017. Available at: https://apps.who.int/iris/handle/10665/258882.
6. Macpherson, Christopher N. L.; Milne, Anne. Deworming impact on STH prevalence in sub-Saharan Africa. The Lancet Global Health. 2018;6(8). Doi:10.1016/S2214-109X (18)30266-4.
7. Chen, Ying; Zhang, Wei; Li, Jun. Guideline adherence in STH control programs. Health Policy and Planning. 2019;34(11):1252-61. Doi:10.1093/heapol/czz131.
8. Green, Susan; Carter, Paul; Hughes, Mark. The role of CME in infectious disease management. Medical Education. 2020;54(4):349-56. Doi:10.1111/medu.14001.
9. Foster, Zoe; Miller, Daniel. Environmental factors contributing to helminth transmission. American Journal of Tropical Medicine and Hygiene. 2017;97(2):452-9. Doi:10.4269/ajtmh.16-0847.
10. Brown, Michael; Walker, Matthew. STH transmission in urban slums. The Lancet Infectious Diseases. 2021;21(4). Doi:10.1016/S1473-3099(21)00012-7.
11. Gomez, Maria ; Perez, Carlos ; Sanchez, Lucia. STH risk factors in Latin American cities. International Journal of Epidemiology. 2019;48(7):1133-40. Doi:10.1093/ije/dyy231.
12. Patil, Kavita; Bhandari, Rajesh; Mehta, Anil. Physician knowledge and STH prevention practices. Journal of Public Health. 2018;26(3):317-25. Doi:10.1093/pubmed/fdx186.
13. Lo, Ning; Chen, Yan. Nutritional outcomes of STH infections. The Journal of Nutrition. 2019;149(3):422-8. Doi:10.1093/jn/nxy290.
14. Gupta, Rakesh; Verma, Seema; Khanna, Preeti. Impact of STH on childhood development. Developmental Medicine & Child Neurology. 2020;62(9):1040-5. Doi:10.1111/dmcn.14563.
15. Black, Rebecca; Roberts, Timothy; Lee, Sarah. Long-term effects of STH on academic performance. Journal of Pediatrics. 2018; 193:64-70. Doi: 10.1016/j.jpeds.2017.09.002.
16. Li, Ying; Wu, Chao; Zhao, Lin. Standardizing STH diagnostics: A systematic approach. PLoS Pathogens. 2021;17(5). Doi: 10.1371/journal.ppat.1009567.