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Prevalence and Trends of Intestinal Parasitic Infections in South Gujarat: A Retrospective Study

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ABSTRACT

Background: Intestinal parasitic infections remain a significant public health problem worldwide, particularly in developing countries. This study aims to assess the prevalence of intestinal parasitic infections among patients attending a tertiary care hospital in Surat, South Gujarat, and to explore how factors such as age and sex influence the prevalence of these infections. The primary goal of this study is to provide insights for targeted public health interventions.

Methods: A retrospective cross-sectional study was conducted in the Parasitology section of the Microbiology laboratory at Government Medical College & New Civil Hospital, Surat, from January to March 2024. A total of 1,283 stool samples were analysed from the Laboratory information system. Data on age, sex, and infection status were collected and analyzed using Microsoft Excel.

Results: Among the 1,283 stool samples, 29 (2.2%) tested positive for parasitic infections. The most affected age group was 1 to 10 years. Of the positive cases, 34.48% were protozoan infections, 58.62% were helminth infections, and 6.9% were mixed infections. The most common protozoan was *Giardia lamblia* (27.59%), while *Ascaris lumbricoides* (48.28%) was the most prevalent helminth. Other identified parasites included *Ankylostoma duodenale*, *Entamoeba histolytica*, and *Trichuris trichiura*.

Conclusion: This study highlights the prevalence and distribution of intestinal parasitic infections in South Gujarat. Although the prevalence is relatively low, sustained public health efforts are necessary. Enhancing sanitation, expanding deworming programs, and adopting advanced diagnostic methods are critical for effective disease management. Further research on zoonotic parasites, drug efficacy, and hygiene practices is recommended to strengthen public health strategies.

Key-words: Intestinal parasitic infections, Helminths, Protozoa, Prevalence, Public health

INTRODUCTION

Intestinal parasitic infections are a major public health concern, particularly in developing countries, where they contribute significantly to morbidity and mortality. These infections disproportionately affect vulnerable populations, including children, and are influenced by factors such as age, sex, and geographic location ^[1,2].

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Access this article online https://iijls.com/ According to a 2004 WHO report, approximately 150.9 million people globally suffer from high-intensity intestinal nematode infections, with South-East Asia accounting for 37.3 million cases ^[3].

In India, the prevalence of intestinal parasitic infections varies widely, ranging from 5.56% to 90%, depending on regional factors such as environmental conditions, socioeconomic status, and healthcare access ^[4-9]. Chronic infections with intestinal helminths, though rarely fatal, can lead to significant health issues, including malnutrition ^[10,11] and impaired cognitive development, particularly in children ^[12,13]. Common parasites such as *A. lumbricoides*, hookworm, and *G. lamblia* are known to cause substantial morbidity ^[14]. In South Gujarat, factors such as hygiene practices, healthcare access, and environmental conditions influence the prevalence of intestinal parasitic infections. Despite the presence of advanced medical facilities in tertiary care hospitals, the burden of these infections persists due to underlying socio-environmental issues ^[15]. This study aims to assess the prevalence of intestinal parasitic infections in patients attending a tertiary care hospital in Surat and to analyze the impact of age and sex on infection rates. The findings will provide valuable insights for designing targeted public health interventions.

MATERIALS AND METHODS

Study Design- This retrospective cross-sectional study was conducted in the Department of Microbiology at Government Medical College & New Civil Hospital, Surat.

Study Setting & Study Period- The study was conducted in the Department of Microbiology at Government Medical College & New Civil Hospital, Surat. The study period, which included data collection, analysis, and writing, spanned 3 months, from January to March 2024. The study was approved by the Institutional Ethics Committee of Government Medical College, Surat.

Study Participants and Data Collection- A total of 1,283 stool samples were collected from the Parasitology

section of the Microbiology laboratory during the study period. Data on stool sample examinations, as well as patients' age and gender, were retrieved from the laboratory information system.

Statistical Analysis- The collected statistical data were entered and analyzed using Microsoft Excel.

Ethical approval: The study was approved by the Institutional Ethics Committee. No. GMCS/STU/RRC-1/Approval/20310/24.

RESULTS

A total of 1,283 stool samples were analyzed, of which 29 tested positive for parasitic infections (Fig. 1). The prevalence of parasitic infections in this study was 2.2%. The highest prevalence was observed in the 1 to 10 years age group (Fig. 2). Among the positive cases (n=29), 34.48% were protozoan infections, 58.62% were helminth infections, and 6.9% were mixed infections. The most common protozoan was *G. lamblia* (27.59%), while the most common helminth was *A. lumbricoides* (48.28%). Other parasites identified included *A. duodenale* (6.9%), *E. histolytica* (6.9%), and *T. trichiura* (3.45%). Mixed infections involving *A. lumbricoides* and *E. histolytica* (3.45%), were also observed (Fig. 3).



Fig. 1: Flow diagram shows the positivity rate of protozoa and helminths

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Fig. 2: Distribution of intestinal parasitic infections by age and gender



Fig. 3: Positivity rate of each parasite among the patients in a tertiary care centre.

DISCUSSION

This study provides an overview of the prevalence and distribution of intestinal parasitic infections in South Gujarat. This section discusses the implications of these findings in the context of existing literature. In our study, the overall prevalence is 2.2%, which is relatively low compared to several other reports from India and Southeast Asia. Studies from various parts of India have reported prevalence rates ranging from 5.56% to as high as 90% ^[16-21]. These higher rates often reflect broader regional challenges, including poorer sanitation and limited access to healthcare, which can exacerbate the spread of parasitic infections.

In Southeast Asia, approximately 37.3 million cases of high-intensity intestinal nematode infections have been reported ^[22]. This significant difference emphasizes the variation in infection rates across different regions, which is influenced by factors such as local environmental conditions, socio-economic status, and access to healthcare.

The comparatively lower prevalence observed in this study could be attributed to underreporting or the success of targeted public health interventions ^[18,19,22].

Helminth infections (58.62%) were found to be more prevalent than protozoan infections (34.48%) in this study, which aligns with other studies. Among the helminths, *A. lumbricoides* emerged as the most common, consistent with previous studies that frequently identify it as a leading parasitic infection in India^[23]. The widespread occurrence of *A. lumbricoides* is often linked to its high transmission potential in areas with poor sanitation^[23].

Protozoan infections, particularly those caused by *G. lamblia*, were also notable in this study. *G. lamblia* was the most frequently detected protozoan, a finding that is supported by other studies highlighting its prevalence in various parts of India ^[23]. Its higher occurrence compared to other protozoa, such as *E. histolytica*, can be attributed to its ability to thrive in diverse environments and its resilience under varying conditions.

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The study identified the highest prevalence of infections in children aged 1 to 10 years, which aligns with findings from other research emphasizing that this age group is particularly vulnerable to intestinal parasitic infections ^[24,25]. Factors contributing to this vulnerability include inadequate hygiene practices, increased exposure to contaminated environments, and frequent contact with soil and fecal matter. These infections can significantly affect children's health, leading to issues such as impaired physical growth and cognitive development. This highlights the importance of implementing targeted health interventions for this demographic region ^[24,25].

Although this study did not specifically analyze genderbased differences in infection rates, existing research indicates that gender disparities may vary depending on cultural and socio-economic factors ^[23]. Some studies suggest that males may have higher infection rates due to differing exposure patterns, while others report no significant differences between genders. Future studies could explore gender-specific infection rates in greater detail to provide a clearer understanding of any potential disparities.

The use of direct wet mount and stool concentration techniques is a well-established approach for detecting parasitic infections. However, these methods have certain limitations, including lower sensitivity for some parasites and the possibility of false-negative results ^[26]. To improve detection accuracy and gain a more comprehensive understanding of parasitic prevalence, advanced diagnostic techniques such as PCR or ELISA could be incorporated ^[26].

The relatively low prevalence reported in this study may indicate progress in local public health initiatives, such as better sanitation and improved access to healthcare. Nevertheless, the continued presence of intestinal parasitic infections, especially among young children, highlights the need for sustained efforts. Strategies such as targeted deworming programs, increased hygiene education, and enhanced healthcare access are essential for effectively managing parasitic infections in South Gujarat ^[26]. The findings from this study can inform local public health policies and contribute to reducing the burden of intestinal parasitic diseases in the region.

CONCLUSIONS

This study provides valuable insights into intestinal parasitic infections in South Gujarat and serves as a

foundation for developing targeted public health interventions. The observed prevalence of 2.2% is lower compared to other regional and global studies. However, the results may underestimate the true burden of disease, as the diagnostic methods used rely on microscopy, which is less sensitive than molecular techniques and may miss low-intensity infections. Despite the lower prevalence, the continued presence of parasitic infections, particularly among children, highlights the need for sustained efforts to control these diseases. Public health initiatives should prioritize improving sanitation, expanding deworming programs, and promoting hygiene education. The adoption of more advanced diagnostic tools and active case detection could provide a clearer picture of the actual disease burden.

Future research should focus on zoonotic parasites, the effectiveness of treatment options, asymptomatic infections, and hygiene practices to further strengthen public health strategies and intervention programs.

CONTRIBUTION OF AUTHORS

Research concept- Komal Kanani, Sangita Rajdev, Summaiya Mullan Research design- Sangita Rajdev, Summaiya Mullan Supervision- Sangita Rajdev, Summaiya Mullan Materials- Komal Kanani Data collection- Komal Kanani Data analysis and interpretation- Komal Kanani Literature search- Komal Kanani Writing article- Komal Kanani Writing article- Komal Kanani Critical review- Sangita Rajdev, Summaiya Mullan Article editing- Komal Kanani Final approval- Sangita Rajdev, Summaiya Mullan

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