**GLOBAL ACADEMIC RESEARCH INSTITUTE**

COLOMBO, SRI LANKA


**GARI International Journal of Multidisciplinary Research**

ISSN 2659-2193

**Volume: 08 | Issue: 02**

On 30th June 2022

http://www.research.lk

Author: Dr. Nimali Jayasuriya, Dr. Dilip Pawar, Madhavi Redkar, Amol Shinde

Base Hospital Homagama, Sri Lanka; Unichem Laboratories LTD, BKL Walawalkar Rural Medical College and Hospital, India

GARI Publisher | Public Health | Volume: 08 | Issue: 02

Article ID: IN/GAR/ICCMPH/2022/132 | Pages: 26-31 (05)

ISSN 2659-2193 | Edit: GARI Editorial Team

Received: 14.01.2022 | Publish: 30.06.2022

# EFFECTIVENESS AND TOLERABILITY OF SECNIDAZOLE IN TREATMENT OF PROTOZOAL INFECTIONS: A QUESTIONNAIRE-BASED SURVEY IN SRI LANKA

[1]Nimali Jayasuriya, [2]Dilip Pawar, [3]Madhavi Redkar, [4]Amol Shinde

*[1]Base Hospital Homagama, [2,4]Unichem Laboratories LTD,*

*[3]BKL Walawalkar Rural Medical College and Hospital*

*[1]Sri Lanka, [2,3,4]India*

## *ABSTRACT*

Protozoan infections are health concern in tropical country like Sri Lanka. It contributes significantly to morbidity and mortality. To evaluate use of single dose of secnidazole 2gm among the physicians for effectiveness and tolerability in protozoal infections. A prospective, observational, cross-sectional study conducted in Sri Lanka for six months with general physician, obstetrician, and gynecologist. A well-defined questionnaire was prepared based on clinical symptoms, effectiveness, tolerability, and resistance pattern. Physician's consent was obtained. In survey 98.25% were general practitioners, followed by obstetrician-gynecologist. In their practice 94.7% physicians prescribed anti-bacterial. All physician prescribed secnidazole for amoebiasis, giardiasis, trichomoniasis and bacterial vaginosis. Secnidazole was prescribed by physicians for symptoms like vaginal pain (64.9%), diarrhea (54.4%), vaginal discharge (35.1%) and abdominal cramps (35.1%). Secnidazole was prescribed most commonly in 93.0% adults. Physicians preferred 2gm secnidazole over metronidazole in amoebiasis (86%), trichomoniasis (31.6%) and giardiasis (24.6%) due to effectiveness (91.2%) accompanied by tolerability (26.3%), less complication (29.8%) and cost effective (22.8%). Secnidazole was preferred over paromomycin in amebiasis (57.9%) and giardiasis (40.4%) due to effectiveness (91.2%) followed by less complications (19.3%), tolerability (5.3%) and cost effective. In metronidazole resistant amoebiasis, (82.5%) Physicians preferred secnidazole. Secnidazole was good to excellent in efficacy (86%) as well as in tolerability in amoebiasis, giardiasis, trichomoniasis and bacterial vaginosis. Single dose secnidazole 2gm was effective and tolerable in various protozoal infections. It is preferred over metronidazole and paromomycin due to better efficacy and tolerability. Secnidazole could be the alternative option for treatment of various protozoal infections.

Keywords: Protozoal infections, questionnaire, secnidazole, efficacy, safety

## *INTRODUCTION*

Protozoan infections are an important health concern in developing countries and affects quality of life if untreated. They are of various type which involves intestinal, extraintestinal and others1. The worldwide prevalence of symptomatic amoebiasis is estimated around 500 million and accounting approximate 1,10,000 deaths annually which is endemic in poor and socio-economically

deprived tropical and subtropical countries2. Similarly, the prevalence for giardiasis is approximately more than300 million cases/annum3, more than 248 million for trichomonas vaginalis in both males and females4 and 5-10 million for vaginitis worldwide.5 Although, region wise the prevalence of these infections may vary. Nitroimidazole drugs such as metronidazole, secnidazole ornidazole, tinidazole, trindiazole and paromomycin are implicated in the treatment of these infections.6 Secnidazole is particularly important in the management in these infections due to its long half-life 17 to 28.8 hours and 92-100% parasitological eradication which make it more suitable for single dose therapy.6,7 Moreover, the present study is conducted to understand the safety and efficacy of single dose of 2gm secnidazole in treatment of various protozoal infections such as amoebiasis, giardiasis, trichomoniasis and bacterial vaginosis through the questionnaire among the practicing physicians. This study is first of its kind conducted among the practicing physicians in Sri Lanka which will be beneficial to recognize the various aspects of single 2gm of secnidazole in treatment of protozoal infections.

## *METHOD*

Study design and study period

A prospective, observational, cross-sectional, study conducted in Sri Lanka for the period of six months from June 2021-December 2021 with general physician, obstetrician, and gynecologist. A structured, well-defined set of questionnaires of secnidazole was prepared in consultation with key opinion leaders consisting of seventeen questions based on clinical symptoms, effectiveness, tolerability, and resistance pattern. The questionnaire was developed by the medical affairs team of Unichem Laboratories LTD and validated on few randomly selected physicians to ensure accuracy and remove the ambiguity of the questions. Physician's voluntary consent was taken for participation in the survey. Participants were requested to respond immediately. Participants were explained about the purpose and methods of the survey. Total 60 sets of questionnaires were provided to different physicians among the various regions of Sri Lanka. These questions had one correct answer. The physicians were asked to mark the correct response to each question. The responses were summarized as number and percentage.

**Data collection and Analysis**

Total 57 questionnaires were responded by physicians. All the responses were collected in person. The original copies of responses were used for further data analysis. The data was analyzed as descriptive and categorial variations expressed as numbers and percentage.

## *RESULTS AND OBSERVATIONS*

A total fifty-seven physicians responded the questionnaire survey out of seventy questionnaires. Majority (98.25%) were the general practitioner and (1.75%) were the obstetrician/gynecologist. It has been found that 94.7% physician prescribed antibacterial prescription for various infections followed by antiprotozoal. In that, majority physician prescribed secnidazole for amoebiasis, giardiasis, trichomoniasis and bacterial vaginosis. Secnidazole was prescribed by physicians for symptoms like vaginal pain (64.9%), diarrhea (54.4%), vaginal discharge (35.1%) and abdominal cramps (35.1%) (Figure 1)

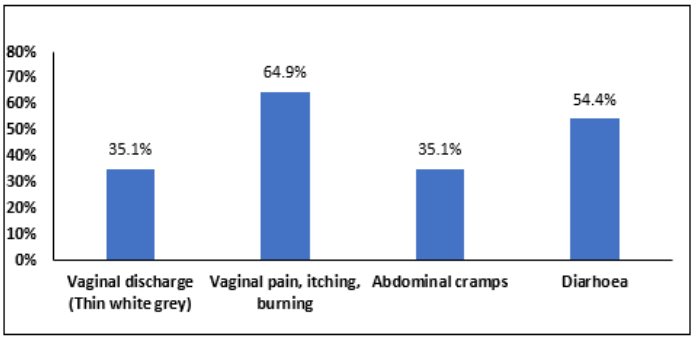


*Figure 1: Secnidazole prescription based on symptoms in patients with amoebiasis/Trichomoniasis/giardiasis/bacterial vaginosis*

It has been observed that secnidazole was prescribed most commonly in adults (93.0%) followed by children (7%) and physician prescribed 2gm secnidazole over metronidazole in amoebiasis (86%), in trichomoniasis (31.6%) and in giardiasis (24%). Similarly, over paromomycin in amoebiasis (57.9%), trichomoniasis (1.8%) and giardiasis (40.4%). (Table 1)

**Table 1: Secnidazole prescribed over other antiprotozoal drugs**

| **Indications** | Secnidazole Vs Metronidazole (%) | Secnidazole Vs Paromomycin (%) |
|---|---|---|
| **Amoebiasis** | 86 | 57.9 |
| **Trichomoniasis** | 31.6 | 1.8 |
| **Giardiasis** | 24.6 | 40.4 |

Physician preferred secndiazole over metronidazole due to effectiveness (91.2%) accompanied by tolerability (26.3%), less complications (29.8%) and cost-effectiveness (22.8%). Similarly, over paomomycin due to effectiveness (91.2%), accompanied by tolerability (5.3%%), less complications (19.3%) and cost-effectiveness (3.5%). (Figure 2)

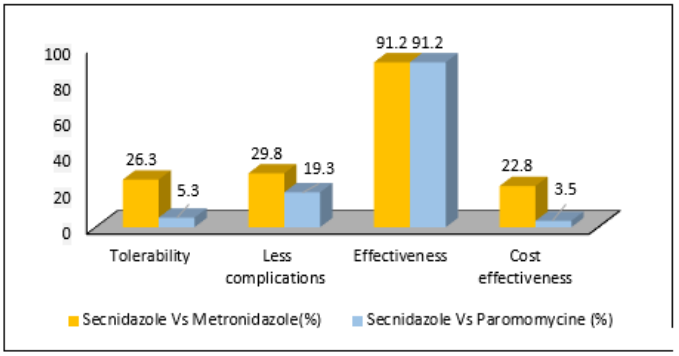


*Figure 2: Secnidazole preffered over other antiprotozoal drugs*

In the questionnaire secnidazole prescription was focused on metronidazole resistant amoebiasis and it has been observed that 82.5% physician preferred secnidazole in metronidazole resistant amoebiasis. (Figure 3)

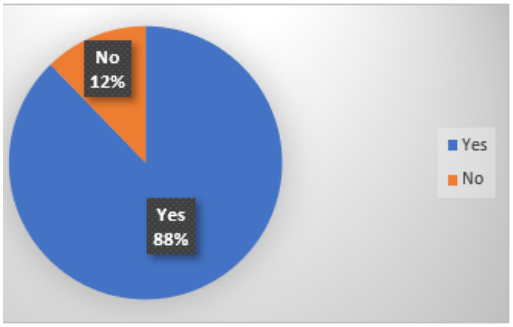


*Figure 3: secnidazole in metronidazole-resistant amebiasis*

## *DISCUSSION*

The present study addresses the questionnaire-based responses from the physician based at Sri Lanka and their perspectives of clinical practice in various protozoal infections such as amoebiasis, giardiasis, trichomoniasis and bacterial vaginosis. Protozoal infections are ancient disease including amoebiasis and still prevalent in the tropical country like Sri Lanka. The complication of amoebiasis presented as extra intestinal manifestation i.e., amoebic liver abscess (ALA) more prevalent in adults consuming local alcoholic beverages and giardiasis in children with poor hygienic condition in low-income Sri Lankan population which considered as a public health concern where appropriate treatment is crucial.

Nitroimidazoles are implicated in the treatment of protozoal infections such as metronidazole, tinidazole, and ornidazole. Aminoglycosides like paromomycin are also used for it. However, Secnidazole is FDA approved nitroimidazole group of drugs and used for the treatment of various protozoal infections such as amoebiasis, giardiasis, trichomoniasis and bacterial infection like bacterial vaginosis.

Secnidazole is chosen for the survey due to its longer half-life (17 to 28.8hr) as compared to tinidazole (10-15hr), ornidazole (11 to 14hr) and metronidazole (7.8-15.1 hr) and requires less-frequent administration. The result of the survey depicted that physicians prescriptions were based on the symptoms in patients as vaginal discharge, vaginal pain, burning, itching, abdominal cramps and diarrhea which is similar of that reported by Abd El Aziz et al1, the meta-analysis of six studies where better clinical cure of symptoms observed in patients of bacterial vaginosis after 1gm and 2gm single dose of secnidazole in comparison with placebo whereas comparable clinical cure seen in comparison with oral or vaginal metronidazole, ornidazole and tinidazole. Similarly, Gillis et al, found that single dose of secnidazole 2gm (30mg/kg in children) achieved 80 to 100% of clinical and parasitological cure in patients with intestinal amoebiasis or giardiasis which is similar to the multiple dosage regimen of metronidazole or tinidazole.

Physicians preferred secnidazole over metronidazole in indication such giardiasis, amoebiasis, trichomoniasis and bacterial vaginosis. It might be due to its efficacy (94.4%) as compared to metronidazole (80%) and milder side effects observed by Modarresi A et al. Similarly, in the treatment of pediatric

giardiasis, clinical cure in chronic (98%) and in acute cases of amoebiasis (80%) observed by Latonio A et al1 but without comparison with metronidazole also, higher microbiological cure rates of 2gm single dose of secnidazole in comparison with placebo in patents with trichomoniasis including HIV and/or BV. Physicians preferred secnidazole over paromomycin in these indications ptobably due to non-availability of paromomycin in srilanka. The physician's preference was in the favor of secnidazole for the effectiveness, tolerability, less complications, and cost effectiveness (figure 2) in comparison with metronidazole and paromomycin. Thulkar J et al18, in their prospective, comparative, randomized clinical trial in the patients of bacterial vaginosis demonstrated single dose of 2gm secnidazole was more effective than metronidazole 2gm. Also, secnidazole is more effective metronidazole in the treatment of giardiasis. Muzny C A et al, observed comparable efficacy of single- or 3-day course of secnidazole in comparison with multiple doses of metronidazole for treating trichomoniasis in men and women and similar results also observed by Gillis JC et al, in patients with intestinal amoebiasis and giardiasis along with good tolerability, convenience and comfort of administration, less complications associated with single dose therapy as most of the adverse events were GI related and not required any specific intervention or withdrawal from the treatment.

Metronidazole is most widely used drug for the treatment of amoebiasis, giardiasis, trichomoniasis and bacterial vaginosis as well as other anerobic infections. Although, the resistance in metronidazole is rising and various mechanism implicated for it., However, Palhares D et al, demonstrated that treatment with secnidazole eradicate metronidazole resistant amoebiasis, which might corelate from the present survey where physicians preferred secnidazole for metronidazole resistant cases.

## *CONCLUSION*

In the questionnaire-based survey, it has been observed that physicians preferred secnidazole for treatment of various protozoal infections. It is evident that secnidazole possesses favorable pharmacokinetic profile, longer half-life, good efficacy, tolerability, and ease of administration with single dose therapy in comparison with the other nitroimidazole specifically metronidazole and paromomycin. Secnidazole may be preferred in metronidazole resistant amoebiasis cases. Although, real world studies are warranted for the robust interpretation in comparison with other nitroimidazoles.

### Limitations

The opinion of participant from the survey may vary and reflect their real practice as the questionnaire majorly focused on the effectiveness and tolerability of secnidazole only. The sample size of the survey is smaller which may impact statistical analysis. The efficacy of secnidazole wasn't measured in real world by analyzing the microbiological cure and clinical cure in patients which might have different values.

### Acknowledgment

The survey was conducted by practicing physicians from across different location from Sri Lanka and we are pleased to acknowledge their contribution.

Sri Lanka Secnidazole Survey Study Group

P.S.T (Mulleriyawa), Buddhi Alwis (Homagama), Inkoa Samarasinghe (Kegalle Road,Ruwansella), B.A.Kumardasa (Mirigama), P.D.N.Panninitiya, Ajit Jayalath

(Yakkala), C.Kekulawala (Mirigama), Subash Jayasinghe (Kegalle), C.Beddhawela (Kegalle), Zakir Mohomad (Mawanela), S.M.K.Jayasuriya (Kegalle), Uindika Bandara (Kegalle), Rasika Amarakoon (Thalawthugoda), R.M.W.S Dikkumbura (Gattawana,road), Thaleshila, M.Auwatt (Mawanela), Chatura Gunasekara (Kotiyakabara), Kaushalya Perera (Gampaha), C.Beminiyawaththa (Rambukkana), S.J.A, Anil Ambawatta (Colomboo), K.C.P.Aluthge, A.Fernando, R.L.W (Homagama), N.R.Ganauathya, P.J.Weeraratn (Thalanagama), T.Wijeseera, Pamdithleela (Kiralapona), R.Bvisalih (Colomboo), Sameera.P (Colomboo), D.S.M (Arjawila Handapangoda), I.Pinnoduwa, Guvathilallee.T (Colomboo), Madusha Rubasinghe (Colomboo), Senarath Weerasekara (Colomboo), Nawaz Mohideen (Grandpass), Shobavi K, Deshautha Pathinayalea (Movatuwa), Yakawdawala (Colomboo), Vedrka Jayaswrya, Aralrajaa (Mutwal), Mithila G, K (Kataheua), A.P.Selvam (Colomboo), Kunalan (Colomboo), T.T.Kumar (Mutwal), Mahesh Mallikahewa (B.H.Homagama), Eapou (Kotabena), Priyanthi Ranasinghe (Mecgoda), G.A.Roncwee (TH.Kegula), S N (TH.Kegula), Lanka Harsiskchandra (TH.Kegula), L.S.Palihawadene (Mewathagama), Asanka Senanayake (Mawasnella), Lushani Jayasekara (Kegalle)

**Declaration and Conflict of Interest**

The authors have no conflicting interests regarding the research.

## *REFERENCES*


*Carrero, J., Reyes-López, M., Serrano-Luna, J., Shibayama, M., Unzueta, J., León-Sicairos, N. and de la Garza, M., 2020. Intestinal amoebiasis: 160 years of its first detection and still remains as a health problem in developing countries. International Journal of Medical Microbiology, 310(1), p.151358.*

*Hegazi, M., Patel, T. and El-Deek, B., 2013. Prevalence and characters of Entamoeba histolytica infection in Saudi infants and children admitted with diarrhea at 2 main hospitals at south Jeddah: a re-emerging serious infection with unusual presentation. The Brazilian Journal of Infectious Diseases, 17(1), pp.32-40.*

*Lanata, C., Fischer-Walker, C., Olascoaga, A., Torres, C., Aryee, M. and Black, R., 2013. Global Causes of Diarrheal Disease Mortality in Children <5 Years of Age: A Systematic Review. PLoS ONE, 8(9), p.e72788.*

*Poole, D.N. and McClelland, R.S., 2013. Global epidemiology of Trichomonas vaginalis. Sexually transmitted infections, 89(6), pp.418-422.*

*Bitew, A., Abebaw, Y., Bekele, D. and Mihret, A., 2017. Prevalence of Bacterial Vaginosis and Associated Risk Factors among Women Complaining of Genital Tract Infection. International Journal of Microbiology, 2017, pp.1-8.*

*Bennett, J.E. 2020. Metronidazole. Mandell, douglas, and bennett's principles and practice of infectious diseases E-book. Elsevier Health Sciences.*

*Gillis, J. and Wiseman, L., 1996. Secnidazole. Drugs, 51(4), pp.621-638.Bennett, J.E. 2020.*

*Kannathasan, S., De Silva, N.R. and Kumanan, T., 2017. Persistence of amoebiasis in northern Sri Lanka–a public health failure.*

*Kannathasan, S., Murugananthan, A., Kumanan, T., de Silva, N.R., Rajeshkannan, N., Haque, R. and Iddawela, D., 2018. Epidemiology and factors associated with amoebic liver abscess in northern Sri Lanka. BMC public health, 18(1), pp.1-8.*

*Galgamuwa, L.S., Iddawela, D. and Dharmaratne, S.D., 2016. Intestinal protozoa infections, associated risk factors and clinical features among*

*children in a low-income tea plantation community in Sri Lanka. Int J Community Med Public Health, 3(9), pp.2452-8.*

*Bennett, J.E. 2020. Paromomycin. Mandell, douglas, and bennett's principles and practice of infectious diseases E-book. Elsevier Health Sciences.*

*Tagera forte PI*

*Abd El Aziz, M., Sharifipour, F., Abedi, P., Jahanfar, S. and Judge, H., 2019. Secnidazole for treatment of bacterial vaginosis: a systematic review. BMC Women's Health, 19(1).*

*Modarresi, A., 2011. Comparing the effect of secnidazole and metronidazole for the treatment of giardiasis in children. Pediatric Research, 70(5), pp.470-470.*

*Latonio, A.A., 1988. Efficacy of a single dose of secnidazole in the treatment of acute and chronic amoebiasis. The Journal of Tropical Medicine and Hygiene, 91(4), pp.202-204.*

*Muzny, C.A., Schwebke, J.R., Nyirjesy, P., Kaufman, G., Mena, L.A., Lazenby, G.B., Van Gerwen, O.T., Graves, K.J., Arbuckle, J., Carter, B.A. and McMahon, C.P., 2021. Efficacy and safety of single oral dosing of secnidazole for trichomoniasis in women results of a phase 3, randomized, double-blind, placebo-controlled, delayed-treatment study. Clinical Infectious Diseases, 73(6), pp.e1282-e1289.*

*Medicines, R., 2022. Registered Medicines. [online] Nmra.gov.lk. Available at: <https://www.nmra.gov.lk/index.php?option=com_drugs&view=drugs&Itemid=221&lang=en#> [Accessed 18 July 2022].*

*Thulkar, J., Kriplani, A. and Agarwal, N., 2012. A comparative study of oral single dose of metronidazole, tinidazole, secnidazole and ornidazole in bacterial vaginosis. Indian journal of pharmacology, 44(2), p.243.*

*Muzny, C.A. and Van Gerwen, O.T., 2022. Secnidazole for Trichomoniasis in Women and Men. Sexual Medicine Reviews.*

*Löfmark, S., Edlund, C. and Nord, C.E., 2010. Metronidazole is still the drug of choice for treatment of anaerobic infections. Clinical infectious diseases, 50(Supplement_1), pp.S16-S23.*

*Wassmann, C., Hellberg, A., Tannich, E. and Bruchhaus, I., 1999. Metronidazole resistance in the protozoan parasite Entamoeba histolytica is associated with increased expression of iron-containing superoxide dismutase and peroxiredoxin and decreased expression of ferredoxin 1 and flavin reductase. Journal of Biological Chemistry, 274(37), pp.26051-26056.*

*Penuliar, G.M., Furukawa, A., Sato, D. and Nozaki, T., 2011. Mechanism of trifluoromethionine resistance in Entamoeba histolytica. Journal of antimicrobial chemotherapy, 66(9), pp.2045-2052.*

*Palhares, D., 2008. Secnidazole for metronidazole-resistant amebiasis. Brasília méd, pp.309-310.*