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Impact Of Foot Reflexology On Peripheral Neuropathy Among Client With Tuberculosis: An Experimental Study -Pilot Report

Tejeshwari B V[1*], Dr.G.Bhuvaneswari[2], Dr.B.G.Parasuramalu[3]

[1]Ph.D Scholar, Department of Research & Development, Saveetha Institute of Medical & Technical Science (SIMATS), Chennai-602105, Tamilnadu, India.
[2]Guide, HOD & Professor, Department of Community Health Nursing, Saveetha College of Nursing, Saveetha Institute of Medical & Technical Science(SIMATS), Chennai-602105, Tamilnadu, India.
[3]Co-guide, Professor, Department of Community Medicine, RajaRajeswari Medical College & Hospital, Bangalore, Karnataka, India.

Abstract

Background: Tuberculosis (TB) is a bacterial infection spread through inhaling tiny droplets from the coughs or sneezes of an infected person. It mainly affects the lungs, but it can affect any part of the body, including the tummy (abdomen), glands, bones, and nervous system Tuberculosis is caused by bacteria that spread from person to person through microscopic droplets released into the air. This can happen when someone with the untreated, active form of tuberculosis coughs, speaks, sneezes, spits, laughs, or sings.

Methods: Quasi-experimental design (one group pre-test post-test design) was recruited by non-probability purposive sampling technique used for the present study. Necessary administrative permission was obtained from the concerned authority. The Structured interview schedule was used to elicit the baseline data.

Result: The study revealed that among 30 Tuberculosis patients, the observational checklist pre-median was 4.0; Post-test I median was 8.0 and whereas Post-test II median was 11.0. In Chalder Fatigue scale pre-median was 25.0, Post-test I median was 17.0, and whereas post-test II median was 9.0. In Michigan Neuropathy scale pre-median was 14.0, the post-test I median was 10.0, and post-test II median was 7.0.

Conclusion:- The study concluded that the foot reflexology on biochemical parameters of anti-tuberculosis drug-induced peripheral neuropathy among Tuberculosis patients from selected community area, Ramanagar Taluk & District, Karnataka carried out the study was found to be effective in the improving knowledge of Tuberculosis patients as evidenced by the significant change between pre-test and post-test scores.

Keywords: - Effectiveness, foot reflexology, biochemical parameters, Tuberculosis patients, peripheral neuropathy

Introduction:

Tuberculosis remains a worldwide public health problem. India is the highest TB burden country with World Health Organization (WHO) statistics for 2011 giving an estimated incidence figure of 2.2 million cases of TB in India out of a global incidence of 9.6 million cases[1].

Tuberculosis is the second most important cause of adult death worldwide due to infectious disease, after HIV/AIDS. Roughly 13.2 million (new and old cases), new cases 9.2 million every year are affected globally (2018). Approximately one in every 10 of these people will develop TB disease, which typically consists of a chronic cough, severe weight loss,

night sweats and progressive, irreversible lung damage.[2]

Peripheral neuropathy (PN) is a serious condition affecting the nerves that are commonly seen in patients with tuberculosis (TB). Causes of PN in patients with Tuberculosis are multiple and can include Tuberculosis itself, other co-morbid conditions, such as Human Immune-deficiency virus (HIV) disease, malnutrition, or diabetes mellitus (DM), and several anti-tuberculosis medications. The condition can manifest with a variety of symptoms, and a diagnosis can usually be made on a clinical basis. Treatment and prognosis of PN vary depending on the under lying cause, but often the condition can lead to permanent disability in individuals with Tuberculosis. For this reason, primary prevention is key as is early identification and management of symptoms. Treatment can include withdrawal of possible offending agents, vitamin supplementation, physical therapy, analgesics, and targeted agents, including tricyclic antidepressants, selective serotonin reuptake inhibitors, and gabapentin. Additional research is needed to better describe the morbidity and disability associated with PN in persons with Tuberculosis and to improve management strategies for persons at risk for and affected by this condition[3].

Peripheral nerves are parts of the nervous system responsible for transmitting information from all parts of the body to the spinal cord and brain. Peripheral neuropathy (PN) is a condition in which the nerves are affected, compromising the relay of information from different parts of the body. It can affect sensory nerves, motor nerves, or autonomic nerves and cause a variety of symptoms and complications. It is estimated that as many as 500 million people in the world suffer from PN, and the problem is commonly seen among individuals with tuberculosis (TB). The pathophysiology of PN results from an insult to the body of the nerve or the myelin sheath, leading to loss of normal function and development of deficits in the affected individual. With Tuberculosis, several factors can lead to damage of the peripheral nerves and the development of neuropathy, including TB itself, other co-morbid conditions, and the medications used to treat the disease[4].

Research methodology:

The research design adopted for the present study was Quanitative research approach. The research design used for the present study was one group pre-test post-test design which belongs to the quasi-experimental study. 30 Tuberculosis patients were recruited for the present study, who met the inclusive criteria were selected through the non-probability purposive sampling technique. The study was conducted in Ramanagar Taluk & District, Karnataka.

Basic demographic data, Observational checklist, Chalder fatigue scale, Michigan neuropathy scale were used as a research tool. Since it is considered to be the most appropriate instrument to elicit the response from subjects. The validity of the tool was established by experts and then proceeding with the main study.

A letter requesting permission was sent to the concerned authority of the selected Community area, Ramanagar Taluk & District, Karnataka before the data collection, and permission were granted for the same. The data was collected in March 2021 at the selected Community area, Ramanagar Taluk & District. After Ethical clearance from RajaRajeswari medical college & hospital, IEC Committee the data was collected from 30 Tuberculosis patients by using non-probability purposive sampling. The purpose of the tools was explained to the samples with self -introduction. After selecting the samples the study was explained & written consent was obtained from each study sample. The tools were distributed to the Tuberculosis patients and they took 15-20 minutes to fill up the answers for the observational checklist related to Tuberculosis and they were very cooperative. In the initial stage the investigator has assessed the clinical variables for both the experimental & control groups followed by the Chalder fatigue scale, Michigan neuropathy scale used to assessed for peripheral neuropathy then administer an observational checklist related to Tuberculosis to assess the knowledge

of Tuberculosis patients, Later foot reflexology was administered for the experimental group every one-month interval the investigator was followed same procedures.

Ethical consideration:

This present study was approved by the RajaRajeswari Medical College & Hospital, Institutional Ethics Committee (RRMCH-IEC/63/2020-21, Dated: 04.01.2021). Before data collection, each respondent has signed informed consent. Also, the respondents were informed about their voluntary participation, may partially or wholly withdraw during the study, their identity was anonymous, and no personal identification information was retrieved to ensure confidentiality.

Results:

Table 1: Effectiveness of Foot reflexology on biochemical parameters of anti-tuberculosis drug-induced peripheral neuropathy among patients with Tuberculosis n=30

S.No.	Parameter	Groups	Median	Percentile	Statistical analysis
1	Observational Checklist	Pre-test	4	3 – 5	H = 80.372 P < 0.001
		Post-test 1	8 [a]	7.75 – 8	
		Post-test 2	11 [ab]	10 – 11	
2	Chalder Fatigue Scale	Pre-test	25	24 – 26	H = 80.150 P < 0.001
		Post-test 1	17 [a]	16 – 17	
		Post-test 2	9 [ab]	8 – 10	
3	Michigan Neuropathy Scale - Subjective	Pre-test	14	14 – 14	H = 81.876 P < 0.001
		Post-test 1	10 [a]	10 – 10	
		Post-test 2	7 [ab]	7 – 8	
4	Michigan Neuropathy Scale - Objective	Pre-test	9	9 – 9	H = 84.702 P < 0.001
		Post-test 1	5 [a]	5 – 5	
		Post-test 2	3 [ab]	3 – 4	

Percentile (25 and 75)
Statistical analysis – Kruskal Wallis one-way ANOVA on ranks with Student Newman Keul's multiple comparison tests. [a] Significantly different from Pre-test
[b] Significantly different from Post-test 1

Table 2:Effectiveness of Foot reflexology on biochemical parameters of anti-tuberculosis drug-induced peripheral neuropathy among patients with Tuberculosis n=6

S.No.	Parameter	Groups	Mean	SEM	Statistical analysis
1	Vitamin B 12 pg/mL	Pre-test	416.7	30.7	t = 3.603 P = 0.004
		Post-test	570.0[a]	29.4	

Statistical analysis – Student't'- test
[a]Significantly different from Pre-test

Discussion:

In general, there is correlation between the peripheral neuropathy with history of Tuberculosis patients. Michigan neuropathy scale act as a parameters for identifying the peripheral neuropathy, with Tuberculosis patients. In this present study all the participants were from rural population and majority of the populations were females.

In 1st experimental group only foot reflexology intervention was given where in 2nd experimental group the supplementation food bolus which contains mainly vitamin B6 and vitamin B12 along with foot reflexology also

provided. Foot reflexology will help to reduce peripheral neuropathy, especially for drug-induced TB patients. A healthy mix bolus containing B 6 and B12 also improve the central nervous systems and reduces peripheral neuropathy. In this study there is an increase in the levels of vitamin B12 among the participants.

The present study revealed that among 30 Tuberculosis patients, the observational checklist pre-median was 4.0; Post-test I median was 8.0 and whereas Post-test II median was 11.0. In Chalder Fatigue scale pre-median was 25.0, Post-test I median was 17.0, and whereas post-test II median was 9.0. In Michigan Neuropathy scale pre-median was 14.0, the post-test I median was 10.0, and post-test II median was 7.0.

The present study has very limited population and duration of intervention was very less and it can be overcome by including more sample population and increasing the duration of intervention in the future.

Conclusion:

PN is a common condition, affecting many people with TB disease. The cause is likely multifactorial, presenting a complex clinical scenario, but the consequences can be severe and permanent hence a need for vigilance in management. Prevention strategies are key, and all persons being treated for TB should receive concomitant pyridoxine supplementation and correction of any modifiable risk factors. All TB patients should be routinely screened for PN and have reflexes tested as well as a visual inspection of the feet at each exam. The presence of neuropathic symptoms decreased ankle reflexes, and decreased distal sensations, regardless of distal muscle weakness and atrophy makes the diagnosis of PN likely. Management should focus on halting damage to the nerve although care should be taken not to compromise the Tuberculosis regimen and alleviate symptoms. Counseling and emotional support may be needed in those with severe forms of the disease. Better research is needed to determine ideal management strategies and to contribute to better health and quality of life for all persons who are survivors of Tuberculosis.

The under diagnosis of PN, especially in primary healthcare in SEA, creates a huge burden of hidden disease. This has a major impact on the quality of life as a result of painful neuropathic symptoms and morbidity due to foot ulceration and amputation, as well as increased mortality. Awareness and a sense of urgency amongst patients and healthcare providers are required, and primary care physicians require access to simple tools to help them diagnose peripheral neuropathy.

Declaration of Conflicting Interest:

The authors have no conflict of interest to declare.

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Authors' Contributions:

All authors made substantial contributions to the conception and design of the study, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content, agreed to submit to the current journal, and gave final approval of the version to be published.

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