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RESEARCH ARTICLE

A COMPARITIVE STUDY TO ASSESS THE EFFICACY OF SEMMES WEINSTEIN MONOFILAMENT AND TUNNING FORK IN PERIPHERAL NEUROPATHY SCREENING AMONG DIABETIC PATIENTS, ATTENDING DIABETIC OUTPATIENT DEPARTMENT AT SELECTED HOSPITAL, PUDHUCHERRY

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ABSTRACT

Background: The burden of diabetes is high and increasing globally, and in developing countries like India, mainly fueled by the increasing prevalence of overweight/obesity and unhealthy lifestyles. Major complications of chronic diabetes mellitus were Lower extremity disease, including peripheral neuropathy, foot ulceration, peripheral artery disease, or lower extremity amputation was twice as common in diabetic person when compared with non diabetic patients. Screening and early identification of neuropathy offers a crucial opportunity for the patient. For these many diagnostic tools were available, particularly screening by Semmes- Weinstein Monofilament and tuning fork were cheaper and easier to detect diabetic peripheral Neuropathy. **Objectives:** 1) To compare the Semmes Weinstein monofilament and tuning fork among chronic diabetic mellitus patients. 2) To find out the association of Semmes Weinstein monofilament and tuning fork among chronic diabetic mellitus patients with selected socio demographic variables. **Methodology:** A Comparative study was conducted to assess effectiveness of Semmes-Weinstein monofilament and tuning fork for peripheral neuropathy screening at selected outpatient department, Puducherry. A Convenient sampling technique was adapted by the examiners and 40 samples with chronic diabetes mellitus patient were selected. A structured questionnaire was used to collect the data. The risk was identified by modified American diabetic association risk category scoring to rule out the diabetic peripheral neuropathy. The content validity was done by experts in nursing and research. The collected data was analyzed by descriptive statistics (frequency, percentage, mean and standard deviation) and inferential statistics (chi square). **Results:** The study is to correlate the effectiveness of Semmes-Weinstein Monofilament and tuning fork for diabetic peripheral neuropathy screening at selected outpatient department, Puducherry. The results of this study concluded that there is a highly significant correlation between the Semmes -Weinstein Monofilament and tuning fork for diabetic peripheral neuropathy screening. **Conclusion:** Diabetic Peripheral Neuropathy is a complication of chronic diabetes mellitus that can lead to problems throughout the extremities. If a person with chronic diabetes mellitus, can develop nerve problems at any time.. Neuropathy can affect nerves that control movement, sensation and other functions. To prevent these complications, screening and early identification is an essential component. Hence Monofilament and tuning fork testing is an inexpensive, easy-to-use, and portable for assessing the loss of protective sensation, and it is recommended by several practice guidelines to detect peripheral neuropathy.

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INTRODUCTION

Health is the level of function and metabolic efficiency of living being. It is the general condition of patients mind and body, usually meaning to be free from illness, injury or pain. Diabetes mellitus is a group of metabolic diseases involving carbohydrate, lipid, and protein metabolism.

It is characterized by persistent hyperglycemia which results from defects in insulin secretion, or action or both. Diabetes mellitus has been known since antiquity. Descriptions have been found in the Egyptian papyri, in ancient Indian and Chinese medical literature, as well as, in the work of ancient Greek and Arab physicians. In the 2nd century AD Aretaeus of Cappadocia provided the first accurate description of diabetes, coining the term diabetes, while in 17th century Thomas Willis added the term mellitus to the disease, in an attempt to describe the extremely sweet taste of the urine.

In recent decades, non-communicable diseases (NCDs) have contributed substantially to the increased mortality rate and have massively increased the global burden. Diabetes, is one of the NCDs of most concern, was shown the overall prevalence of diabetes mellitus is 11.6% in China in 2010. Which threatens the patients' health, which cause a large financial burden for the patients, families, and society. Diabetes has reached epidemic proportion worldwide with international diabetes federation estimates suggesting a prevalence of 425 million peoples worldwide in (2017), rising to 628 million by 2045. this rise will be accompanied by an increasing in the prevalence of the complication of diabetes.

DPN is the most common cause of neuropathy worldwide and is estimated to affect around half of people with diabetes. It causes considerable morbidity impairs quality of life and increases mortality. Indeed approximately one fourth of the US health care expenditure on diabetes is spent on DPN. It is estimated that there are 463 million diabetics in the world. About 88 million diabetics are from the South East Asia region, of which 77 million are from India. Diabetic neuropathy is a common complication affecting almost 50% of the diabetic patients. Among these, 75% of the diabetic neuropathies are attributed to DSPN. The early detection of diabetic neuropathy using an objective screening test followed by its appropriate management is important as up to 50% of the patients may be asymptomatic. Screening for neuropathy at the primary care setting will provide an avenue for early intervention and prevents progression of the disease.

OBJECTIVES

- To compare the Semmes Weinstein monofilament and tuning fork among chronic diabetic mellitus patients.
- To find out the association of Semmes Weinstein monofilament and tuning fork among chronic diabetic mellitus patients with selected socio demographic variables.

HYPOTHESIS

There is a relationship between Semmes- Weinstein monofilament and tuning fork test for sensation of foot in selected sample.

MATERIALS AND METHODS

Quantitative research approach was used for the study. The study population comprises of patients who are getting treatment at diabetic outpatient department, IGGH and PGI, Puducherry. Convenient sampling technique was adopted for this study. It comprises of 40 patients with chronic diabetes mellitus who fulfilled the inclusion criteria. The structured demographic questionnaire was used to collect the information and the risk of diabetic peripheral neuropathy.

Monofilament and Tuning fork examination were done DPN is identified by using modified American diabetic association risk assessment category. The data analysis was done by using appropriate descriptive and inferential statistics. The descriptive statistics used were mean and standard deviation used to assess the risk of diabetic peripheral neuropathy. Inferential statistics such as Chi-square test was used to find the association between the risk of diabetic peripheral neuropathy among the selected demographic variables.

SAMPLING CRITERIA

INCLUSION CRITERIA

- Patients who are willing to participate.
- Patients who are all diagnosed with diabetes mellitus at diabetic outpatient department.
- The patient who are all having chronic diabetes mellitus and visited to the diabetic outpatient department.

EXCLUSION CRITERIA

- Patients who are having known case of hypothyroidism, renal diseases, malignancies, HIV, leprosy, Lumbar spine disorder, peripheral arterial disease, Vitamin B12 deficiency,
- Previous history of cardiovascular disorder or other central nervous system disorder.
- Patient who under the treatment of beta blocker, chemotherapy, or on other medicines to relive neuropathy.
- Patient who are Chronic alcohol consumer and chronic smoker.

DATA COLLECTION PROCEDURE: The researchers obtained formal permission from the ethical clearance committee of Sabari College of Nursing, Kirumambakkam, director of medical services, Puducherry. On the first day of data collection, Researchers introduced themselves and Informed consent was obtained from the all participants by the researchers. Initially. The structured demographic questionnaire was used to collect the information and diabetic peripheral neuropathy questionnaires was used to assess the level of sensational perception of patient, over a period of 20 minutes. Monofilament Examination was done, Similarly the tuning fork test was done to the diabetic patient in outpatient department in selected hospital for a period of one week. Modified North Devon Healthcare Monofilament risk categorization score was used for Semmes-Weinstein Monofilament assessment and Modified National Orthopaedic Hospital grading of peripheral neuropathy by tuning fork risk score for Tuning fork assessment. The effectiveness of Semmes Weinstein monofilament examination was compared with tuning fork test by using a risk classification scoring system.

RESULT AND FINDINGS

The study is to correlate the effectiveness of Semmes-Weinstein Monofilament and tuning fork for diabetic peripheral neuropathy screening at selected outpatient department, Puducherry. The results of this study concluded that there is a highly significant correlation between the Semmes -Weinstein Monofilament and tuning fork for diabetic peripheral neuropathy screening.

Table 1.1. Correlation between Semmes-Weinstein Monofilament and Tuning Fork tests in diabetic patients.

Variables	(r)	Strength of correlation	Significance of correlation
Semmes-Weinstein Monofilament and tuning fork(right)	0.762	Moderately strong positive	Highly significance
Semmes-Weinstein Monofilament and tuning fork(left)	0.788	Moderately strong positive	Highly significance

TABLE 1.1: The above table shows that the correlation between the Semmes-Weinstein Monofilament test and tuning fork test for right foot (0.762) and for left foot (0.788). Hence, it is revealed that strength of correlation is moderately strong positive and highly significant.

DISCUSSION

The assessment of effectiveness of the Semmes-Weinstein Monofilament is likely greater than the tuning fork test. The finding shows that mean value of right foot is 6.5 in monofilament and 5.02 in tuning fork, mean value of left foot is 6.8 in monofilament and 5.1 in tuning fork.

There is a significant correlation between Semmes-Weinstein monofilament test and Tuning Fork test to test DPN (Diabetic peripheral neuropathy). The finding shows that the strength of correlation is moderately strong positive and highly significant for right foot the r value is 0.762 and for left foot the r value is 0.788.

CONCLUSION

Diabetic Peripheral Neuropathy is a complication of chronic diabetes mellitus that can lead to problems throughout the extremities. If a person with chronic diabetes mellitus, can develop nerve problems at any time.. Neuropathy can affect nerves that control movement, sensation and other functions. To prevent these complications, screening and early identification is an essential component. Hence Monofilament and tuning fork testing is an inexpensive, easy-to-use, and portable for assessing the loss of protective sensation, and it is recommended by several practice guidelines to detect peripheral neuropathy.

RECOMMENDATIONS

- A similar study can be conducted on a larger scale to generalize the study findings.
- A similar study can be conducted to find out the effectiveness of Semmes-Weinstein Monofilament for diabetic peripheral neuropathy screening.
- A comparative study can be conducted to find out the effectiveness between Semmes-Weinstein Monofilament and tuning fork.

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