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**ASSESS THE PERIPHERAL NEUROPATHY BY USING SEMMES WEINSTEIN 10 G MONOFILAMENT AMONG TYPE II DIABETIC PATIENT AT A SELECTED VILLAGE, VELLORE**

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Received on: 10-03-2018

Accepted on: 25-05-2018

**Abstract:**

Diabetes is a major metabolic disorder. The global burden of diabetes is rapidly increasing. Diabetic peripheral neuropathy is the most common complication of diabetes which can cause Neuropathy which is one of the strong factors that causes foot ulcer, amputation and other foot complications. All patients with diabetes should be screened for loss of protective sensation in their feet by using simple clinical test the Semmes Weinstein Monofilament examination. This Descriptive research was conducted in a selected village, Vellore district; the samples were 60 Type II diabetes mellitus that fall under the inclusion criteria selected with Purposive sampling technique. The results revealed that among the selected 60 samples (120 feet) was that 28(46.6%) samples had non neuropathic right foot and 32(53.3%) samples had Loss Of Protective Sensation in right foot. And then 33 (55%) samples had non neuropathic left foot and 27(45%) samples had Loss of Protective Sensation in Left foot. Finally 23(38.3%) samples had bilateral Loss of protective sensation. And 13 (21.6%) samples had unilateral Loss Of Protective and about 24(40%) sample had non neuropathic right and left foot. There is a significant association between Demographic variables and Loss Of Protective Sensation in the left and right feet at  $p < 0.05$  and the years affected with diabetes, recently check blood glucose level were non significant in right foot and age and recently checked blood glucose level was non significant in left leg at  $p < 0.05$ . Finally the investigator conclude by saying that it is very necessary for every diabetes mellitus to be screened for peripheral neuropathy at least ones a years as it is the important risk factor

that causes foot ulcer and foot amputation. As a nurse I take the privilege to make people aware of these

were basic screening device Semmes Weinstein Monofilament.

**Keyword:** Neuropathy, Diabetic Peripheral neuropathy, Type II diabetic patient, Semmes Weinstein Monofilament, Loss of Protective Sensation.

### **Introduction:**

Diabetes is rapidly gaining the status of potential epidemic disease in India. According to an estimate by International Diabetic Federation (IDF), 80% of people with diabetes live India. According to World Health Organization in 2016, International Diabetic Federation, Global report the prevalence of diabetic population in India is increasing at a rate of 2.02 per 1000 population per year. In India 69.2 million people are living with diabetes (8.7%) as per 2015 data. And 36 million people remain undiagnosed. In India the peripheral neuropathy varied from 5 to 2400 per 10,000 populations (Trivedi. S 2017) It is also estimated that still majority of population that is 52.1% remain undiagnosed (36.1 million people).

The regional prevalence of in Tamil Nadu. Diabetic foot wounds are most common cause of amputation. (Scollankoliopoulos .et. al.,2010) .The diabetic patient will develop neuropathy and cannot feel if they have a cut ,or wound on their foot(Perkins.et.al.2010),as a result wound can become large and infected and makes healing difficult. Each year throughout the world, 4 million people will develop a diabetic foot wound (Murpy et.al., 2012).It has been estimated that 15 %( journal of diabetes research) of all diabetes patients will develop foot ulcer at some point in their life. According to American Diabetes Association, all patients with diabetes should be screened for loss of protective sensation annually with Semmes Weinstein Monofilament test. Nurses with necessary training can use of this Semmes Weinstein 10 g Monofilament test, screening peripheral neuropathy and prevent amputation and life threatening infection and improve the quality of life of ever diabetic patient.

### **Materials and Methods**

The research design is Descriptive research design with quantitative, approach. The targeted population were Male and female patients with type II diabetes mellitus who comes under the inclusion criteria(Diabetic patient both male and female without foot ulcer who at the age 35-75 years old without diabetic foot ulcer, by excluding type I diabetic patients, foot ulcer patients)were selected with purposive sampling technique at the selected village, Vellore.

**Instrumentation:**

Section A: consist of Demographic variables consist of age, sex, level of education, Body Mass Index, years affected with diabetes mellitus, type of work, treatment for diabetes mellitus, frequency of check up, recently checked blood sugar level. Section B consist of Semmes Weinstein Monofilament test. Score was interpreted as score  $\geq 7/10$  as Non neuropathic and score  $< 6/10$  Loss Of protective Sensation .Data analysis was done with Descriptive statistics( mean, standard deviation) and Inferential statistics(chi square).

**Results**

Among the selected 60 samples (120 feet) was that 28(46.6%) samples had normal right foot and 32(53.3%) samples had Loss Of Protective Sensation in right foot. And then 33 (55%) samples had Normal left foot and 27(45%) samples had Loss Of Protective Sensation in Left foot. Finally 23(38.3%) samples had bilateral Loss of protective sensation. And 13 (21.6%) samples had unilateral Loss Of Protective and about 24(40%) sample had normal right and left foot. Majority of the samples were Female for about 37(61.6%) samples and only 23(38.3%) of the samples were male.

**Section A:**

**Table 1: Frequency and percentage distribution of the demographic variables among Type II Diabetes mellitus patients.**

S.N O	DEMOGRAPIC VARIABLES	FREQUENCY (NO)	PERCENTAGE (%)
1.	AGE		
	a) 35-45 years	8	13.3%
	b) 46-55 years	14	23.3%
	c) 56-65 years	20	33.3%
	d) 65-75 years	18	30%
2.	Gender		
	a) Male	23	38.3%
	b) Female	37	61.6%
3.	Level of education		
	a) Illiterate	5	3%
	b) $<10^{\text{th}}$	22	36.7%
	c) 10/12 <sup>th</sup> completed	19	31.6%
	d) College	14	23.3%

4.	Body Mass Index (BMI)=weight in Kg/height in m <sup>2</sup> a) Under weight - >18.5 b) Normal weight - 18.5-24.9 c) Over weight - 25.0-29.9 d) Obese - 30.0<	9 29 18 4	15% 48.3% 30% 6.6%
5.	Years that the person was affected with diabetes mellitus a) <1 year b) 1-5 years c) 6-10 years d) >10 years	12 25 9 14	20% 41% 15% 23.3%
6.	Type of work a) Sedentary work b) Light work c) Medium work d) Heavy work	5 41 11 3	8.3% 68.3% 18.3% 5%
7.	Frequency of check up a) Monthly ones b) Yearly ones c) Rarely d) Never	42 9 6 3	70% 15% 10% 5%
8.	Recently checked blood glucose level a) 60-120 mg/dl and below b) 121-160 mg/dl c) 161-200 mg/dl d) 201 mg/dl and above	12 22 17 9	20% 36.6% 28.3% 15%

**Table 2: Mean and Standard deviation for Loss of Protective Sensation in left and right feet.**

S.NO	VARIABLES	MEAN ( $\bar{x}$ )	STANDARD DEVIATION ( $\sigma$ )/SD
1.	Loss Of Protective Sensation in right foot	6.31	3.15
2.	Loss Of Protective Sensation in left foot	7.15	2.75

**Tables 3: Association between demographic variables and Loss of Protective Sensation in right foot and**

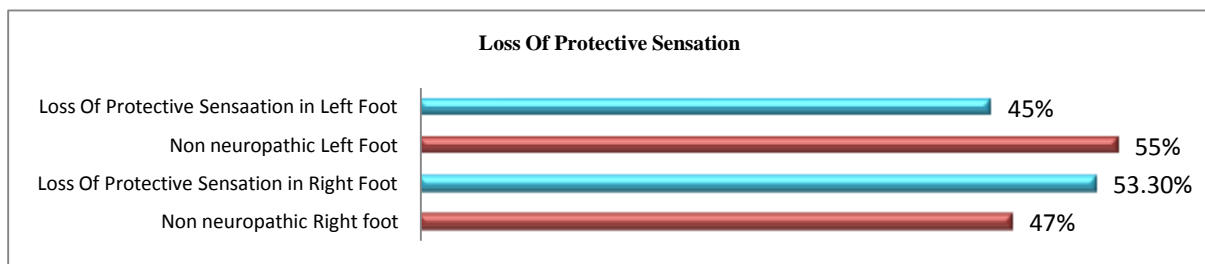
**left foot with their frequency distribution and percentage.**

S.NO	DEMOGRAPIC VARIABLES	Non neuropathic Right foot		Non neuropathic left foot		Loss of protective sensation right foot		Loss Of Protective Sensation left foot		Chi square $X^2$	Chi square $X^2$ Left foot
		Frequenc y	%	Frequ ency	%	Frequ ency	%	Frequ ency	%	Right foot	
1.	AGE										
	a) 35-45 years	7	11.6	7	11.6	1	1.6	1	1.6	DF=3 $X^2=6.$	DF=3 $X^2=19.77$
	b) 46-55 years	5	8.3	7	11.6	9	15	7	11.6	14	$p=7.82$
	c) 56-65 years	9	15	12	20	11	18.	8	13.3	$p=7.8$	Non Significant
	d) 65-75 years	7	11.6	7	11.6	11	3	11	18.3	2	Signif icant
							18.		3		
2.	Gender									DF=1 $X^2=0.$	DF=1 $X^2=1.26$
	a) Male	9	15	12	20	14	23	11	18.3	85	$p=3.84$
	b) Female	19	31.6	16	26.6	18	30	21	35	$p=3.8$	Signif icant
										4	
										Signif icant	
3.	Level of education									DF=3 $X^2=6.49$	DF=3 $X^2=6.49$
	a) Illiterate	2	3.3	2	3.3	3	5	3	5	DF=3 $X^2=3.$	$p=7.82$
	b) <10 <sup>th</sup>	11	18.3	9	15	11	18.	13	21.6	93	Signif icant
	c) 10/12 <sup>th</sup> completed	11	18.3	8	13.3	8	3	11	18.3	$p=7.8$	
	d) College	11	18.3	11	18.3	3	13.	3	5	2	Signif icant
							3				
							5				

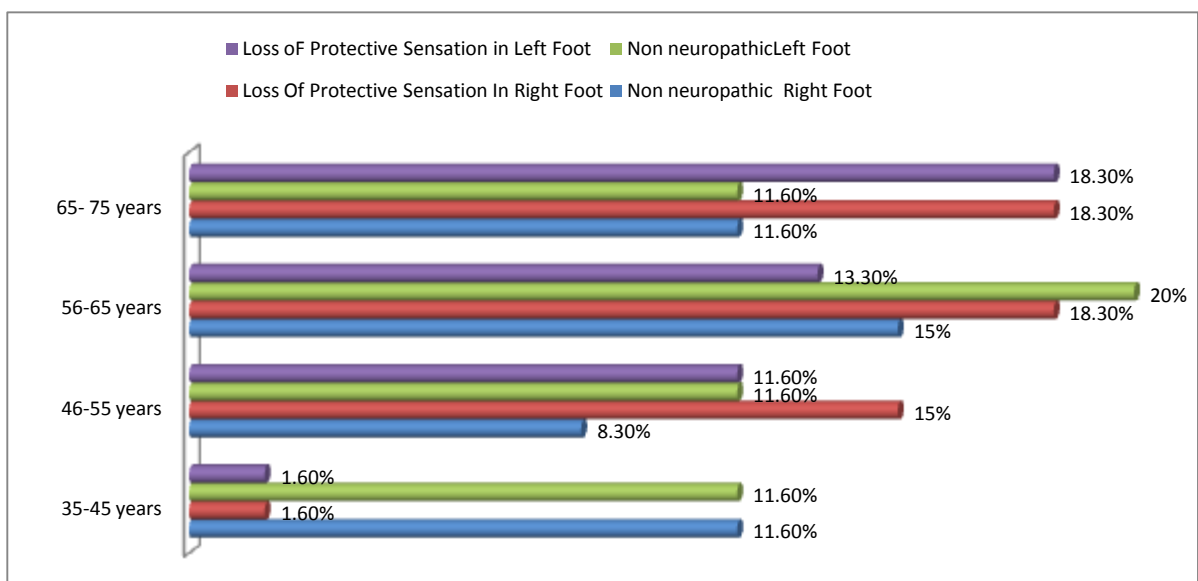
4.	Body Mass Index (BMI)=weight in Kg/height in m <sup>2</sup> a) Under weight - >18.5 b) Normal weight - 18.5-24.9 c) Over weight - 25.0-29.9 d) Obese - 30.0<	4	6.6	4	6.6	5	8.3	5	8.3	DF=3 X <sup>2</sup> =3.92 p=7.8	DF=3 X <sup>2</sup> =4.59 p=7.82 Significant
5.	Years affected with diabetes mellitus a) <1 year b) 1-5 years c) 6-10 years d) >10 years	12	20	10	16	0	0	2	3.3	DF=3 X <sup>2</sup> =14.27 p=7.8	DF=3 X <sup>2</sup> =5.82 p=7.82 Significant
6.	Type of work a) Sedentary work b) Light work c) Medium work d) Heavy work	1	1.6	1	1.6	4	6.6	4	6.6	DF=3 X <sup>2</sup> =2.98 p=7.8	DF=3 X <sup>2</sup> =3.68 p=7.82 Significant
7.	Frequency of check up a) Monthly ones b) Yearly	18	30	16	26.6	24	40	26	43.3	DF=3 X <sup>2</sup> =3.68 p=7.8	DF=3 X <sup>2</sup> =4.84 p=7.82 Significant

	ones									2	
	c) Rarely									Signif	
	d) Never									icant	
8.	Recently checked blood glucose level	10	16.6	10	16.6	2	3.3	2	3.3	DF=3	DF=3
	a) 60-120 mg/dl and below	10	16.6	12	20	12	20	10	16.6	$X^2=9.23$	$X^2=8.87$
	b) 121-160 mg/dl	5	8.3	5	8.3	12	20	12	20	$p=7.8$	$p=7.82$
	c) 161-200 mg/dl	3	5	6	10	6	10	3	5	2	Non Significant
	d) 201 mg/dl and above									Non Significant	Non Significant

**Figure 1: Overall Frequency and percentage distribution of patient with peripheral neuropathy (Loss of Protective Sensation\_LOPS) in right and left foot.**



**Figure 2: Association of age with Loss of Protective Sensation in Right and Left foot.**



## **Discussion**

The first objective was to assess Loss of Protective Sensation (LOPS) / Peripheral neuropathy in right foot in type II diabetic patient by using Semmes Weinstein Monofilament test. In this study the investigator the interpretation methods and analysis Score interpretation-Non neuropathic-  $\geq 7/10$  score, Loss Of protective Sensation  $< 6/10$  score. This is similar to Aziz Nather et.al.,2011 study in which the investigator interpreted as patient who can feel 7 or more out of 10 sites were categorized as normal and patient who could feel  $< 7$  sites were classified as having Loss of Protective Sensation. The second objective was to determine the association between various demographic variables and Loss of Protective Sensation in right and left foot. In this study the association was done with Chi-square as a tool for inferential statistics. With  $p$ -probability value  $< 0.05$  is considered as significant. Table 3: Reveals that there is a significant association between age, gender, level of education, body mass index, , type of work, treatment for diabetes mellitus, frequency of check up , and Loss Of Protective Sensation in the left foot at  $p < 0.05$ . Years affected with diabetes mellitus and recently checked blood glucose level were non significant at  $p > 0.05$ . Table 4 : Reveals that there is a significant association between gender, level of education, body mass index, , type of work, treatment for diabetes mellitus, years affected with diabetes mellitus, frequency of check up , and Loss Of Protective Sensation in the left foot at  $p < 0.05$ . Age and recently checked blood glucose level were non significant at  $p > 0.05$ . This is relevant to Aziz Nather, et.al. [2011] study statistical analysis using Chi-square with  $p$ -probability value  $< 0.05$  represented as significant and when  $p$  is  $< 0.001$  it was considered as highly significant.

## **Ethics and Consent:**

The study was conducted after getting permission from institution ethical Committee and The Panjayat president of the selected village. And the procedure of the study was clearly explained to the samples only if they accept the data was collected from them.

## **Conflict of interest:**

The investigator says that there is no conflict of interest

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