



To Study the Role of 48 Hrs Continuous Intravenous Insulin Infusion in Patients of Diabetic Neuropathy

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Abstract

Introduction: Diabetic neuropathy is a very common clinical presentation bringing a diabetic pt. to O.P.D. Many studies have shown that use of insulin helps in improvement of symptoms of such patients.

Material & Method: In this study 25 patients of diabetic neuropathy were given I/V insulin infusion for 48 hrs.

Results: In this study statistically significant improvement was seen in symptoms of paraesthesia ($P < 0.05$) Hypoaesthesia ($p < 0.05$) cramps pain ($p < 0.05$) however symp. of vibration sense loss, position sense loss & diminished reflexes didn't show significant improvement and similarly autonomic symptoms were also not improved.

Discussion: This study suggests that insulin has neurotrophic effect on nerves.

Introduction

Diabetes mellitus is the most common endocrine disease worldwide. Diabetic Neuropathy occurs in 50% of individuals with long standing type – I and type - II D.M. Sensory, motor and autonomic nerves are concomitantly involved. Diabetic neuropathy affects all parts of central nervous system except brain. It is of utmost importance to have strict glycemic control in diabetes, which can be achieved by insulin, oral hypoglycemics, dietary measure, to lower down the pace of development of these complications. In recent years many studies have shown that Intensive Therapy designed to achieve glycemic level as close to normal as possible prevents or slow the progression of neuropathy when compared with conventional therapy in patients with diabetes mellitus. The Aim of present study was to study

the role of 48 hours continuous intravenous insulin, infusion in patients of diabetic neuropathy. Diabetic neuropathy is the involvement of peripheral nerves incorporating sensory and motor elements of both somatic and autonomic divisions. Hence there are polymorphous groups of clinical syndromes ranging from acute onset with short duration and reversibility to an insidious onset, progressive and irreversible. Neuropathy adds more to morbidity than to mortality and causes both peripheral and autonomic neuropathy. Presently as metabolic theory and a vascular theory are being considered. Of these metabolic factors are considered to be of greater importance in young patients with Type –I DM and early stage of relatively younger patients with type – II DM. However in later age and with longer duration of diabetes, superimposed vascular

factors become more critical in expression of neuropathy.

Material and Methods

Twenty five cases of diabetes mellitus with different duration of diabetes, drawn from the diabetic clinics, OPD and indoors of the post graduate department of Medicine, L.L.R.M. Medical College, Meerut constituted the material for the present study.

Cases were having signs or symptoms or both or investigations suggestive of peripheral neuropathy.

Step -I: The patients of diabetes mellitus with peripheral neuropathy were selected.

Step - II: Patients were given intensive treatment for diabetes control.

Step - III: 48 hours continuous intravenous insulin infusion was given to all the patients.

Step-IV: Symptoms, signs and nerve conduction velocity were compared before and after insulin infusion.

Inclusion Criteria

- Diagnosis of diabetes mellitus.
- Patient with symptoms of tingling, numbness and pain sensation or signs of peripheral neuropathy and diabetic drugs.
- Lab-supported diagnosis of painful diabetic distal symmetrical sensory / motor polyneuropathy.
- Pain for the previous three months.

Table 1: Duration of Diabetes Mellitus and Symptoms of Sensory & Motor Neuropathy At Initial Assessment

SYMPTOMS	STUDY GROUP (n = 25)				
	0-5	6-10	11 -15	16-20	%
Paresthesia	1	10	2	1	14(56%)
Hypoesthesia	1	12	2	2	17(68%)
Cramps and Pain	2	8	1	2	13(52%)
Weakness	0	6	2	2	10(40%)

As shown in Table 2. Loss of vibration sense, followed by loss or diminished reflexes are the most common signs in this study.

Table 2 Duration of Diabetes Mellitus and Sign of Sensory and Motor Neuropathy at Initial Assessment

SIGN	STUDY GROUP (n = 25)				
	0-5	6-10	11 -15	16-20	%
Position sense Loss	0	8	2	2	12(48%)
Vibration sense loss	2	12	2	2	18(72%)
Reflexes loss or diminished	2	10	2	2	16(64%)

- Not pregnant.

Exclusion Criteria

- Patients failed adequate trial of 3 or more medications or has required narcotics for pain.
- Severe pain that could confound the assessment.
- Patient has had any amputation.
- Patient who had participated in last 30 days or is currently participating in another trial.
- Patient has previously received treatment with quinidine and dextromethorphan.

Patients were subjected to detailed clinical examination and following parameters established. (1) Age (2) Height, Weight, (3) BMI, (4) Blood sugar (fasting and postprandial), (5) Nerve conduction studies, (6) Electromyography (EMG) Besides these all routine investigations were done. BMI, Blood sugar levels, NCV & EMG were done.

In this study nerve conduction studies were done of the bilateral common peroneal nerves and sural nerve of lower limb. The nerve conduction studies were done at 1st day, 3rd day and one month later.

Results

In the study maximum number of patients presented with complains of paraesthesia, hypoesthesia and cramps and pain.

As shown in table 3 fullness of stomach, constipation and postural giddiness were the most common symptoms of autonomic neuropathy in diabetic patients of this study.

Table 3: Duration of Diabetes Mellitus and Symptoms of Autonomic Neuropathy at Initial Assessment

SYMPTOMS	STUDY GROUP (n = 25)				
	0-5	6-10	11 -15	16-20	%
Postural Giddiness	0	10	2	2	14(56%)
Palpitations	0	5	1	1	7 (28%)
Abnormal Sweating	2	6	3	2	13(52%)
Bladder Symptoms	0	6	2	1	9(36%)
Fullness of Stomach	0	12	3	2	17(68%)
Constipation	1	10	3	2	16(64%)

The symptoms of paresthesia, hypoesthesia, cramp and pain show statistically significant improvement in this study after 48 hours continuous insulin infusion.

Table 4: Symptoms of Sensory & Motor Neuropathy after 48 Hours Insulin Infusion in Study Group

Symptoms	Study Group (n = 25)		
	Initial	Follow Up	P Value
Paresthesia	14(56%)	3(12%)	<0.05
Hypoesthesia	17(68%)	8 (32%)	<0.05
Cramps and Pain	13(52%)	5 (20%)	< 0.05
Weakness	10(40%)	5 (20%)	> 0.05

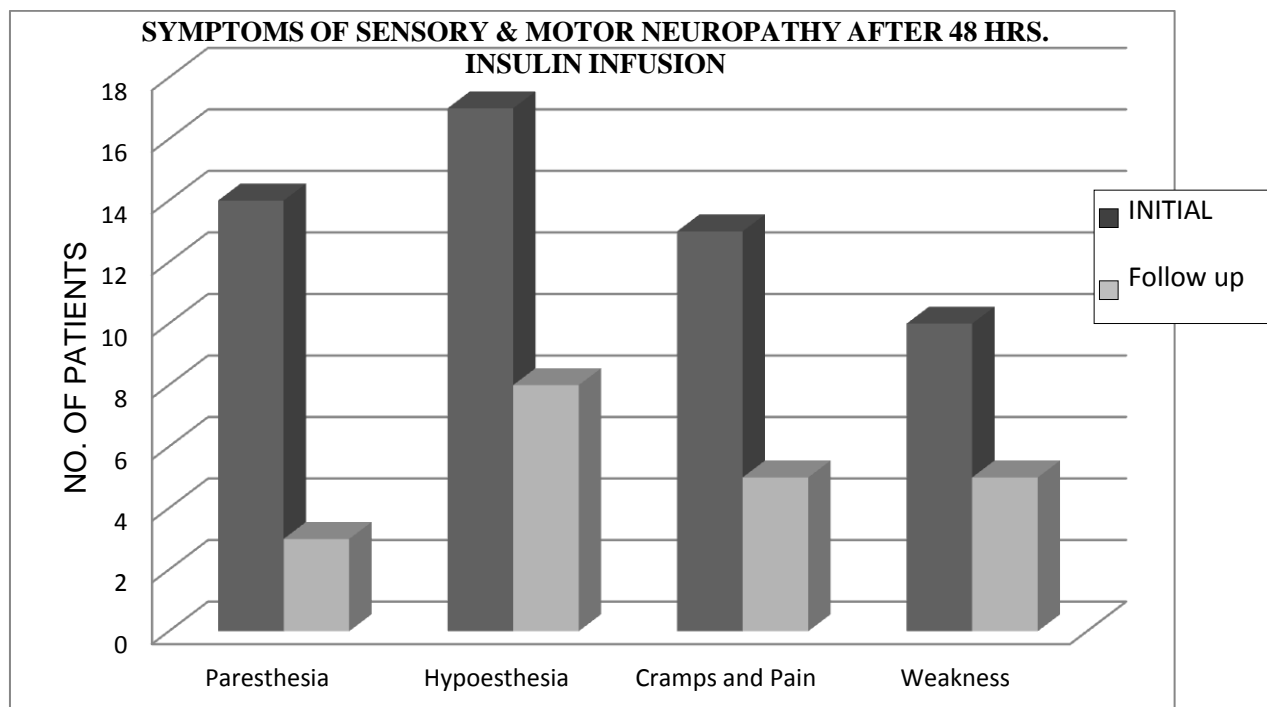


Table 5 shows that some cases showed improvement in vibration sense and position sense loss after 48 hours continuous insulin infusion.

Table 5: Signs of Sensory & Motor Neuropathy after 48 Hours I/V Insulin Infusion.

Signs	Study Group (n = 25)		
	Initial	Follow Up	P Value
Vibration sense loss	18(72%)	12(48%)	>0.05
Position sense loss	12(48%)	6 (24%)	>0.05
Reflexes loss or diminished	16(64%)	16(64%)	>0.05

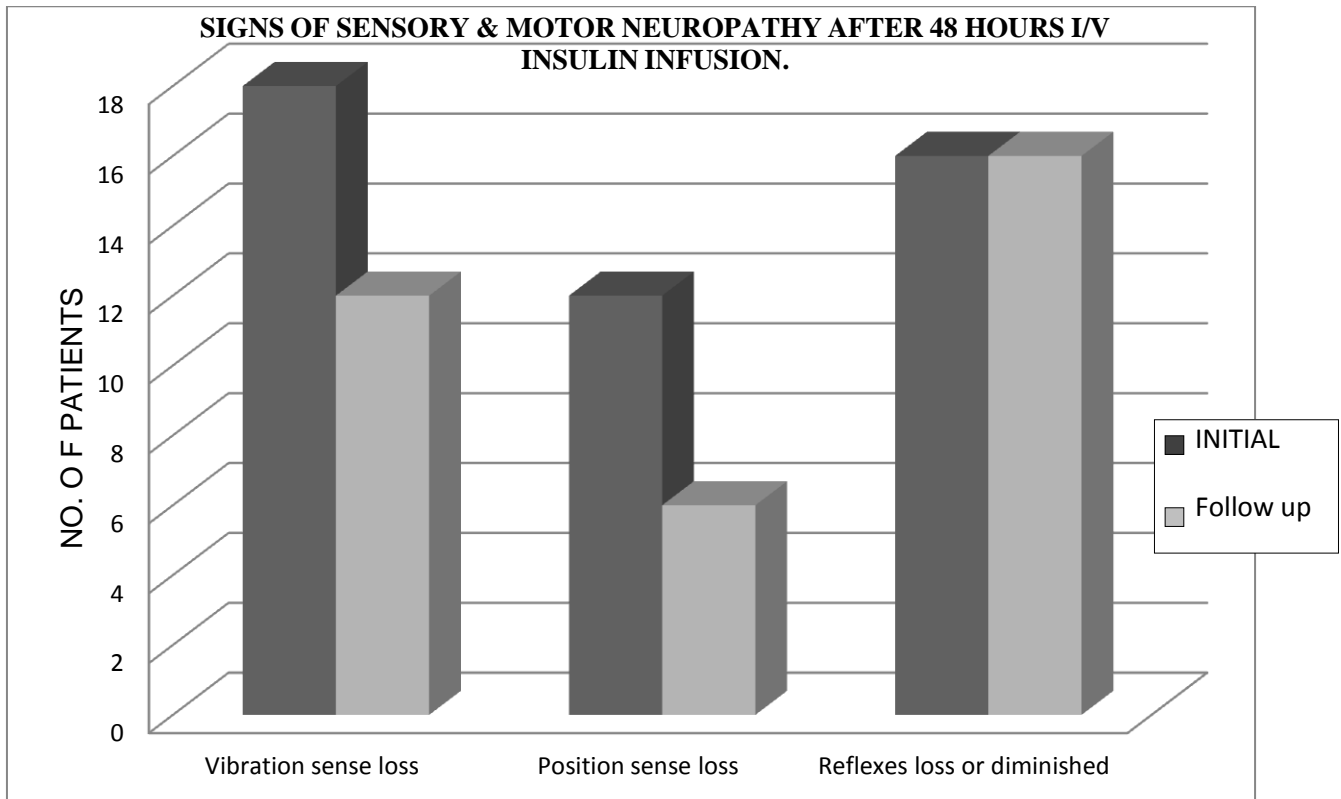
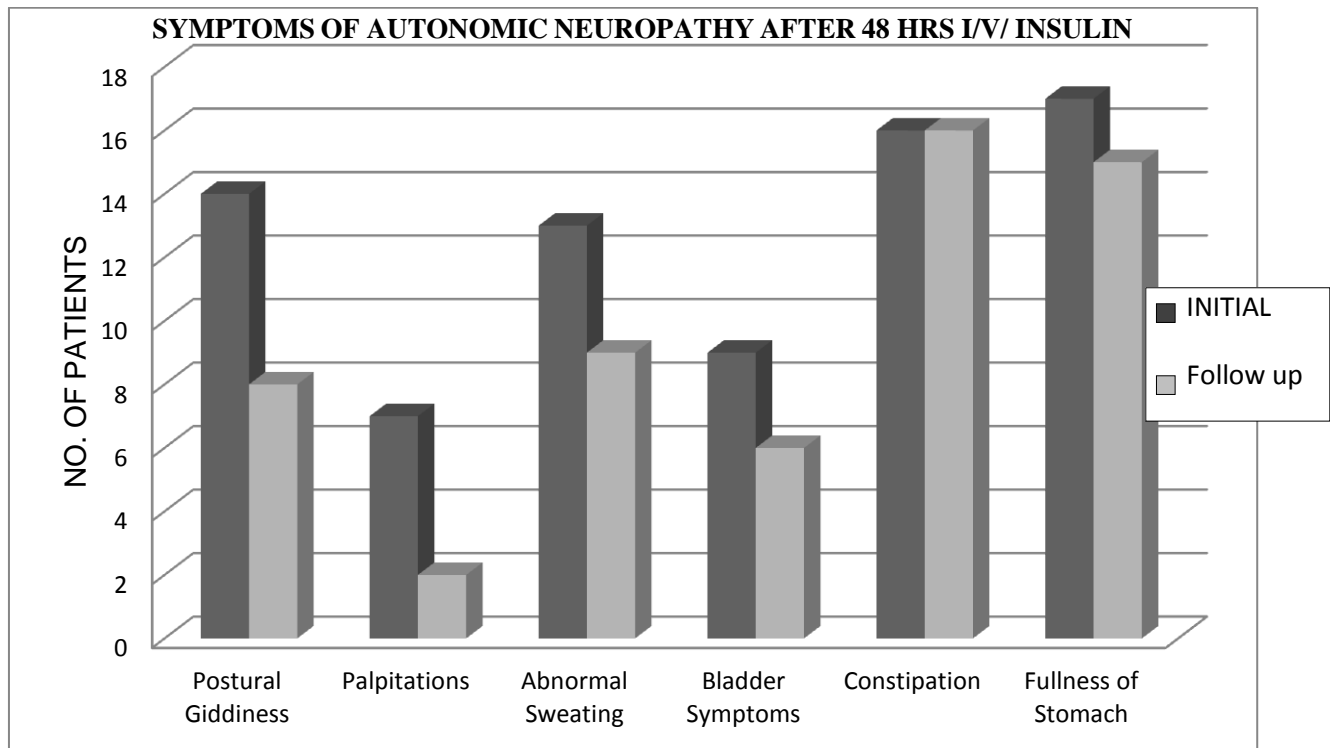


Table 6 shows that postural giddiness, palpitations, abnormal sweating improved in some cases after 48 hours continuous insulin infusion.

Table 6: Symptoms of Autonomic Neuropathy in Study Group After 48 Hours I/V Insulin

Symptoms	Study Group (n = 25)		
	Initial	Follow Up	P Value
Postural Giddiness	14(56%)	8 (32%)	>0.05
Palpitations	7 (28%)	2 (8%)	>0.05
Abnormal Sweating	13(52%)	9 (36%)	>0.05
Bladder Symptoms	9 (36%)	6 (24%)	>0.05
Constipation	16(64%)	16(64%)	>0.05
Fullness of Stomach	17 (68%)	15(60%)	>0.05



Discussion

This study suggests that insulin has neurotrophic effect on nerves as intensive insulin therapy and continuous insulin infusion improved the clinical features of diabetic neuropathy. In the small fibre neuropathy which presented as painful paresthasias, burning stabbing, crushing aching or cramp like pain, loss of pain and temperature sensation, statistically significant improvement was seen in cramps and pain (61.54%, $p < 0.05$), paresthasias (78.58%, " $p < 0.05$) and hypothesia (53%, $p < 0.05$).

In the large fibre neuropathy, which presented as impaired vibration and joint & position sense and diminished muscle stretch reflexes, improvement was seen in, 33.34% case of vibration sense loss ($p > 0.05$), 50% cases of position sense loss ($p > 0.05$) which was statistically insignificant. No improvement was seen in diminished muscle stretch reflex. Thus improvement in the large fibre neuropathy was statistically insignificant.

This suggests that use of insulin infusion is justifiable in patients of diabetic neuropathy having severe burning and paresthasia. Since the study was carried out in small number of patients, therefore further studies with more patients should be performed for confirmation of the results.

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