ORIGINAL RESEARCH

Efficacy of gabapentin, and duloxetine in patients with diabetic peripheral neuropathy

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ABSTRACT
Background: Diabetic neuropathy is a type of nerve damage that can occur in people with diabetes. The present study was conducted to compare the efficacy of gabapentin, and duloxetine in patients with painful diabetic peripheral neuropathy. **Materials & Methods:**74 patients with diabetic peripheral neuropathy of both genderswere divided into 2 groups of 37 each. Group I were given 300 mg/day gabapentin (GBP) and group II were given 20 mg/day duloxetine (DLX). The pain was assessed with visual analogue scale (VAS). The Sleep Interference Score (SIS), and adverse reactions were determined. **Results:** Group I had 20 males and 17 females and group II had 18 males and 19 females.Biothesiometry was mild in 6 and 8, moderate in 25 and 22 and severe in 6 and 7. Monofilament test was mild in 8 and 8, moderate in 19 and 20 and severe in 10 and 9 patients in group I and II respectively. The difference was non- significant (P> 0.05). Adverse reactions were in group I and group II were nausea/vomiting in 2 and 3, micturition in 1 and 0, dizziness in 0 and 1 and somnolence in 3 and 2 patients respectively. The difference was non- significant (P> 0.05). **Conclusion:** Monotherapy with GBP, and DLX provided clinically and subjectively meaningful pain relief in patients with DPNP.
Keywords: Diabetic neuropathy, gabapentin, duloxetine

INTRODUCTION

Diabetic neuropathy is a type of nerve damage that can occur in people with diabetes. It is a common complication of both type 1 and type 2 diabetes, especially when blood sugar levels are poorly controlled over a prolonged period. Diabetic neuropathy can affect nerves throughout the body, but it most commonly affects the nerves in the legs and feet.[1,2]

There are several types of diabetic neuropathy, each with its own set of symptoms and effects. Peripheral Neuropathy is the most common type of diabetic neuropathy and affects the nerves that control sensation, particularly in the feet and legs. Symptoms may include numbness, tingling, burning sensations, and sharp pains.[3] Peripheral neuropathy can also lead to complications such as foot ulcers and infections.Autonomic Neuropathyaffects the autonomic nervous system, which controls involuntary functions such as heart rate, digestion, and bladder function. Symptoms may include problems with heart rate variability, digestive issues such as gastroparesis (delayed stomach emptying), bladder problems, and sexual dysfunction.Proximal Neuropathy (also called Diabetic Amyotrophy)affects nerves in the thighs, hips, buttocks, and legs. Symptoms may include severe pain, weakness, and difficulty moving the affected limbs.[4]

Pregabalin (PGB), another gabapentinoid, was approved in 2005 for the treatment of neuropathic pain. Gabapentin (GBP), a more recent generation anticonvulsant, is licensed for this purpose in Europe.[5] These are thought to be the most successful treatments for DPNP, with supporting data. The serotonin-norepinephrine reuptake inhibitor (SNRI) duloxetine (DLX) was initially licensed for use as an antidepressant to treat major depressive disorder. Additionally, reports of its effectiveness in DPNP.[6]The present study was conducted to compare the efficacy of gabapentin, and duloxetine in patients with painful diabetic peripheral neuropathy.

MATERIALS & METHODS

The present study consisted of 74 patients with diabetic peripheral neuropathyof both genders. All gave their written consent to participate in the study.
Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 37 each. Group I were given 300 mg/daygabapentin (GBP) and group II were given 20 mg/dayduloxetine (DLX). The pain was assessed with visual analogue scale (VAS). The Sleep Interference Score (SIS)were determined. By keeping track of the occurrence of adverse medication responses, safety was assessed.Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Groups	Group I	Group II
Drug	300 mg/day gabapentin	20 mg/dayduloxetine
M:F	20:17	18:19

Table I shows that group I had 20 males and 17 females and group II had 18 males and 19 females.

Table II Assessment of parameters

Parameters	Variable	Group I	Group II	P value
Biothesiometry	Mild	6	8	0.53
	Moderate	25	22	
	Severe	6	7	
Monofilament test	Mild	8	8	0.75
	Moderate	19	20	
	Severe	10	9	
MNSI		6.5	5.2	0.05
VAS		60.4	57.2	0.12
SIS		6.3	6.1	0.84

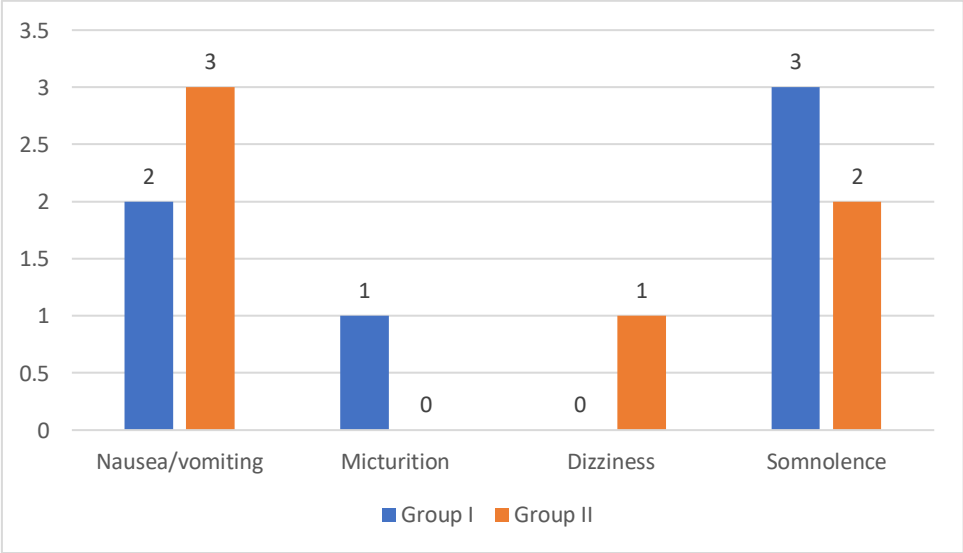
Table II shows that Biothesiometry was mild in 6 and 8, moderate in 25 and 22 and severe in 6 and 7. Monofilament test was mild in 8 and 8, moderate in 19 and 20 and severe in 10 and 9 patients in group I and II respectively. The difference was non- significant (P> 0.05).

Table III Comparison of adverse reactions

Adverse reactions	Group I	Group II	P value
Nausea/vomiting	2	3	0.75
Micturition	1	0	
Dizziness	0	1	
Somnolence	3	2	

Table III, graph I shows that adverse reactions were in group I and group II were nausea/vomiting in 2 and 3, micturition in 1 and 0, dizziness in 0 and 1 and somnolence in 3 and 2patients respectively. The difference was non- significant (P> 0.05).

Graph I Comparison of adverse reactions



DISCUSSION

Diabetic neuropathy is a common microvascular complication of diabetes mellitus.[7,8] Symptoms of diabetic neuropathy range from mild dysesthesias to severe unremitting pain that can profoundly affect the quality of life.[9]The present study was conducted to compare the efficacy of gabapentin, and duloxetine in patients with painful diabetic peripheral neuropathy.

We found that group I had 20 males and 17 females and group II had 18 males and 19 females.Devi P et al[10] examined the safety and effectiveness of pregabalin (PGB), duloxetine (DLX), and gabapentin (GBP) in patients suffering from excruciating diabetic peripheral neuropathy (DPNP). GBP, DLX, or PGB were randomly assigned to 152 patients who had a history of pain associated with DPNP and a minimum 40-mm score on the visual analogue scale (VAS). Out of the 152 patients, 50 received DLX and GBP individually, while 52 received PGB. All three treatment groups experienced a substantial reduction in pain score (VAS), sleep interference score, PGIC, and CGIC over time ($P<0.05$), with no statistically significant difference observed between the groups. For the VAS, PGIC, and sleep interference score, there was a significant interaction ($P<0.001$) between the time and therapy groups. PGB showed a greater improvement in pain levels (VAS) and sleep interference scores than DLX and GBP. In 9.2% of instances, there were mild adverse medication responses.

We found that Biothesiometry was mild in 6 and 8, moderate in 25 and 22 and severe in 6 and 7. Monofilament test was mildin 8 and 8, moderate in 19 and 20 and severe in 10 and 9 patients in group I and II respectively. Lesser et al[11]assessed the efficacy and tolerability of pregabalin (75, 300, 600 mg/day) vs placebo in patients with diabetic peripheral neuropathy (DPN).Patients (n = 338) were randomized to receive one of three doses of pregabalin or placebo TID. Pregabalin 600 mg/day was titrated over 6 days; lower doses were initiated on day 1.Patients in the 300- and 600-mg/day pregabalin groups showed improvements in endpoint mean pain score (primary efficacy measure) vs placebo. Improvements were also seen in weekly pain score, sleep interference score, patient global impression of change, clinical global impression of change, SF-McGill Pain Questionnaire, and multiple domains of the SF-36 Health Survey. Improvements in pain and sleep were seen as early as week 1 and were sustained throughout the 5 weeks. Responders (patients with > or =50% reduction in pain compared to baseline) were 46% (300 mg/day), 48% (600 mg/day), and 18% (placebo). Pregabalin was well tolerated with a low discontinuation rate. The most common adverse events were dizziness and somnolence.

We found that adverse reactions were in group I and group II were nausea/vomiting in 2 and 3, micturition in 1 and 0, dizziness in 0 and 1 and somnolence in 3 and 2 patients respectively. Goldstein et al[12]in their study type 1 or type 2 diabetes mellitus-related polyneuropathy causing pain in 457 individuals was randomly randomized to receive treatment with duloxetine at doses of 20 mg/d (20 mg QD), 60 mg/d (60 mg QD), 120 mg/d (60 mg BID), or placebo. A minimum score of three on the Michigan Neuropathy Screening Instrument indicated the diagnosis. The main indicator of efficacy was the weekly mean score of the 24-hour Average discomfort Score, which was calculated using diary data collected over the course of two site visits. The score was assessed on an 11-point Likert scale (0–10), ranging from no discomfort to the worst conceivable pain. From one week after randomization to the 12-week mark, duloxetine 60 and 120 mg/d showed statistically significant better improvement on the 24-hour Average Pain Score when compared with placebo.Moreover, duloxetine differed from placebo on almost all of the secondary measures, including those that measured health-related outcomes. When compared to placebo, a significantly higher number of patients in each of the three active treatment groups experienced a 50% decrease in the 24-hour Average Pain Score. Less than 20% of patients stopped using duloxetine owing to adverse effects, making the medication safe and well tolerated. Diabetic peripheral neuropathic pain was safely and effectively managed with duloxetine at doses of 60 and 120 mg/d.

The limitation of the study is the small sample size.

CONCLUSION

Authors found that monotherapy with GBP, and DLX provided clinically and subjectively meaningful pain relief in patients with DPNP.

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