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# Efficacy and Safety of Duloxetine in Patients with Neuropathic Pain

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**Abstract:** The present study was designed to find out the safety and efficacy of Duloxetine, a selective serotonin/norepinephrine reuptake inhibitor, for the treatment of neuropathic patients. In this study, 50 patients with peripheral neuropathic pain were selected. Assessment of pain using Visual Analogue Scale (VAS) was done on the day of data collection (Baseline), Review 1 (after 2 weeks) and Review 2 (after 4 weeks) of Duloxetine therapy (Proforma 2). Assessment of neuropathic pain using LANSS scale and DN4 Questionnaires was done on the day of data collection (Baseline), Review 1 (after 2 weeks) and Review 2 (after 4 weeks) of the Duloxetine therapy (Proforma 3 & 4). Adverse Effects for the study group were measured from the baseline till the review 2. There was a reduction in the VAS pain score in the patients from 6.46 (baseline) to 2.96 (Review 2) respectively. There was a reduction in the LANSS score in the patients from 12.34 (baseline) to 6.72 (Review 2) respectively. There was a reduction in the DN4 Questionnaire in the patients from 4.55 (baseline) to 2.37 (Review 2) respectively. Adverse reaction such as Somnolence (28 %), Giddiness (8 %) Insomnia (6 %) and null adverse effect (58 %) were reported with duloxetine. In our study, duloxetine has shown a better relief in neurological symptoms over a 1 month of follow-up. Study results suggest that Duloxetine in daily doses of 20 to 120 mg/day was effective and well tolerated in patients with different types of neuropathic pain, indicated through improved pain scores.
**Keywords: Duloxetine**, Neuropathic Pain, Efficacy and Safety.

## Introduction

Neuropathic pain (NP) can be defined as abnormal pain sensation in the peripheral or central nervous system after injuries. It is caused by dysfunctions in the peripheral or central nervous system without peripheral nociceptor stimulation[1]. Many common diseases, such as post therapeutic neuralgia, trigeminal neuralgia, diabetic neuropathy, spinal cord injury, cancer, stroke, and degenerative neurological diseases may produce neuropathic pain[2]. Multiple mechanisms, including changes in the peripheral nervous system, spinal cord, brainstem or brain, may contribute to the neuropathic pain[3]. It includes signs and symptoms that arise from a primary lesion in the peripheral nerve and/or from dysfunction in the central nervous system in the absence of nociceptor stimulation, such as postherpetic neuralgia (PHN)[4]. Duloxetine hydrochloride, a selective serotonin and norepinephrine reuptake inhibitor that is relatively balanced in its affinity for serotonin and norepinephrine reuptake transporters, is approved by the Food and Drug Administration (FDA) for the treatment of MDD[5,6] and generalized anxiety disorder [7,8] , and for the management of diabetic peripheral neuropathic pain [9,10].

### Methods

Ethical clearance was obtained from the Institutional Ethical Review Board (IERB). A written informed consent was obtained from all the patients enrolled in the study. At screening, the eligibility criteria for inclusion in the study were patient with neuropathic pain based on history, clinical examination, Leeds Assessment of Neuropathic Symptoms and Signs (LANSS) score and DN4 (Douleur Neuropathique 4) questionnaires. A pain score of at least 40 mm on the 100 mm visual analogue scale (VAS) was considered for inclusion. Other inclusion criteria were patients should be aged between 18 to 75 years of both genders diagnosed with neuropathy. Exclusion criteria of the study were patients with contraindications to the study medications, patients who were already on other medication for the treatment of neuropathic pain one week prior to the study enrolment, those with hepatic, cardiac or renal failure, patients with a history of any other neurological disorders (epilepsy), psychiatric diseases, patients who have undergone amputation of even one lower limb, patients who did not give written informed consent, and pregnant or lactating women.

### Study Design

This was a 1 month, randomized, open label, comparative study. Outpatients, based on eligibility criteria who reported at the AVS Clinic, Chennai, were enrolled in this study.

### Randomization

The estimated sample size for the study (including dropouts) was 50 patients. Patients who fulfilled the inclusion/exclusion criteria were randomized by computer generated randomization table into the three treatment groups.

### Treatment Schedule

Study patients received Duloxetine (DLX) 20 mg/day, up to 120 mg/day as decided by the consultant endocrinologist based on the clinical status. All patients were followed up monthly and were assessed for efficacy and safety. Data was collected in a specially designed case record form (CRF) by conducting a personal interview with each patient during the clinic visit.

### Efficacy and Safety Assessments

The primary efficacy parameter was reduction in severity of pain rating recorded in patients using LANSS pain scale and DN4 Questionnaires was done on the day of data collection (Baseline), Review 1 (after 2 weeks) and Review 2 (after 4 weeks) of the Duloxetine therapy. The monthly mean VAS score for pain was calculated for each patient. The reduction in mean VAS score value from baseline to 4 weeks post treatment was considered as the primary endpoint. The safety of study medication was assessed in all patients by recording adverse drug reactions (ADRs) as reported by them. The details of occurrence, intensity and causal relationship to the study drug along with the findings of physical and clinical examination were considered.

### Statistical Analysis

All qualitative variables are reported as frequencies and percentages. Quantitative variables are described as means with standard deviation.

## Results and Discussion

The study was designed to find out the safety and efficacy of Duloxetine in the treatment of neuropathic patients.

Out of the selected 50 patients, 8 patients (11.53 %) were in the age group of 40 – 50 years, 14 patients (23.07 %) were in the age group of 51 – 60 years, 16 patients (38.46 %) were in the age group of 61 – 70 years, 5 patients (11.53 %) were in the age group of 71 – 80 years and 5 patients (15.38 %) were in the age group of 81 – 90 years. It indicates that more number of people in the age group of 61 – 70 years is affected with neuropathic pain (Figure 1).

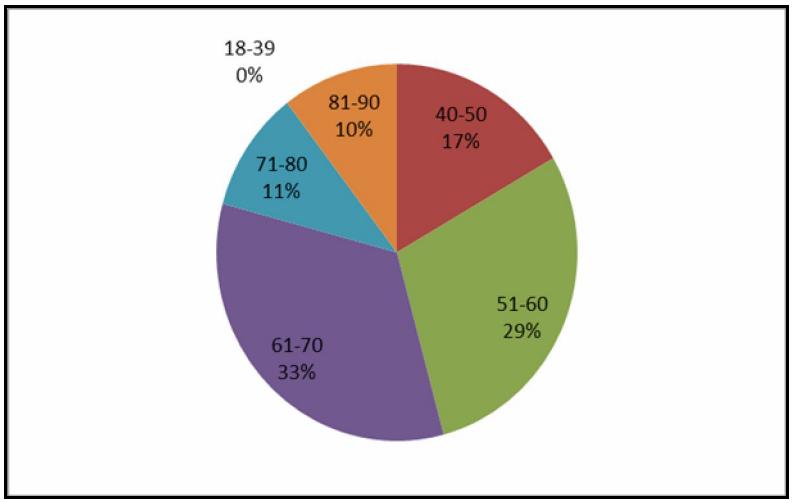


**Figure 1: Age Wise Distribution**

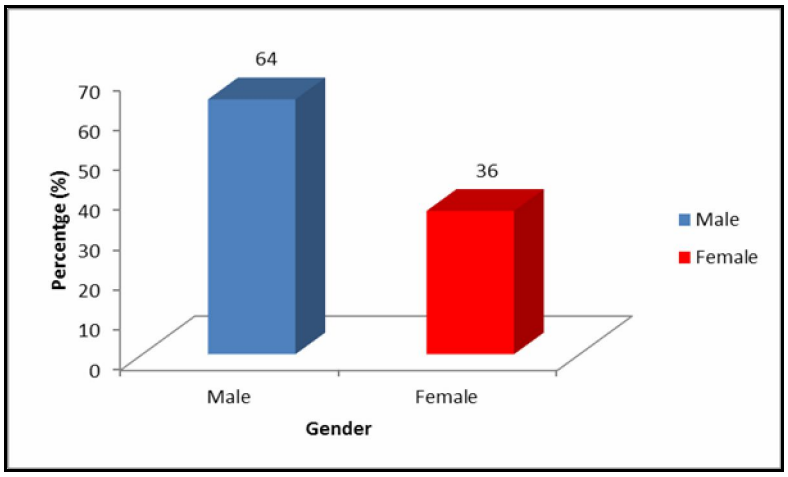


**Figure 2: Gender Wise Distribution**

Out of selected 50 patients, 32 patients (64 %) were male and the remaining 18 patients (36 %) were female, which confirms that males are more likely to have neuropathic pain than females (Figure 2).

Out of selected 50 patients, 4 patients (8 %) were smoker, 6 patients (12 %) were alcoholic, 5 patients (10 %) were both smoker and alcoholic and remaining 35 patients (70 %) do not have any social habits (Figure 3).

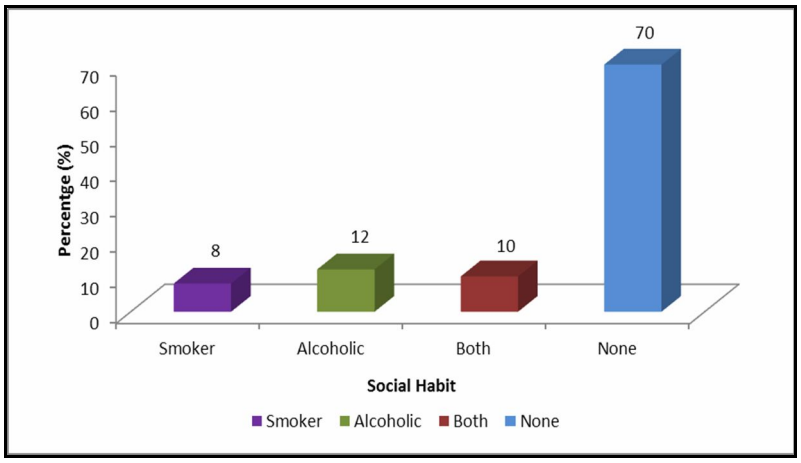


**Figure 3: Distribution Based on Social Habit**

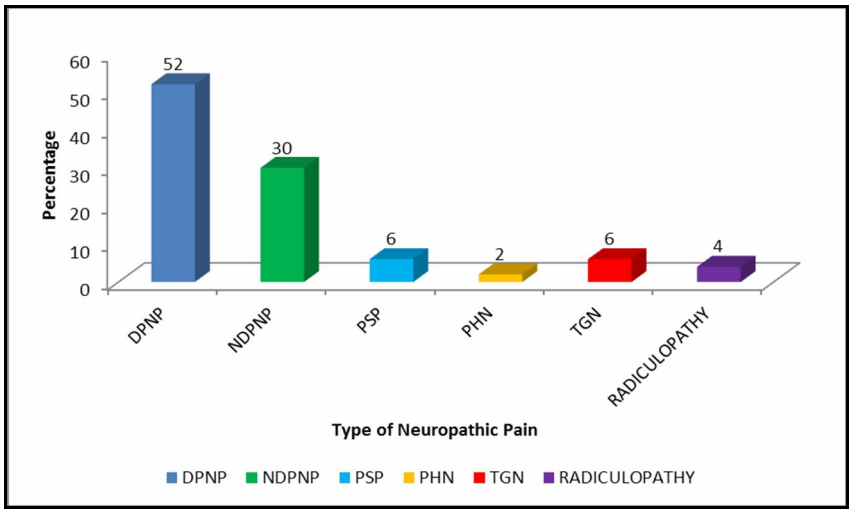


**Figure 4: Diagnosis Wise Distribution**

Out of 50 patients, the major diagnosis was DPNP – 26 (52 %) patients, NDPNP – 15 (30 %) patients, TGN – 3 (6 %) patients, PSP – 3 (6 %), Radiculopathy – 2 (4 %) patients and PHN – 1 (2%) patient. Prevalence of more number of Diabetic Neuropathy Pain patients was seen in this study than other neuropathic pain conditions (Figure 4).

The mean and SD changes of pain found by using VAS scale was 6.46 ± 1.82 (baseline); 4.9 ± 1.44 (Review 1) and 2.96 ± 2.13 (Review 2) respectively. There was a reduction in the VAS pain score in the patients from 6.46 (baseline) to 2.96 (Review 2) respectively (Figure 5).

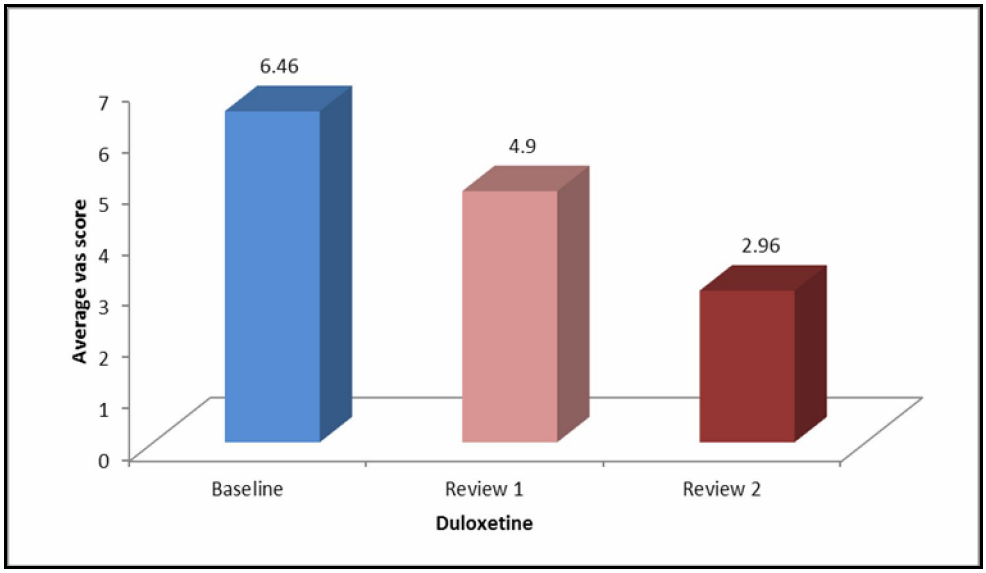


**Figure 5: Pain Score using VAS Scale**

The mean and SD changes of pain found by using LANSS scale was 12.34 ± 2.40 (baseline); 8.83 ± 1.59 (Review 1) and 6.72 ± 2.36 (Review 2) respectively. There was a reduction in the LANSS score in the patients from 12.34 (baseline) to 6.72 (Review 2) respectively (Figure 6).

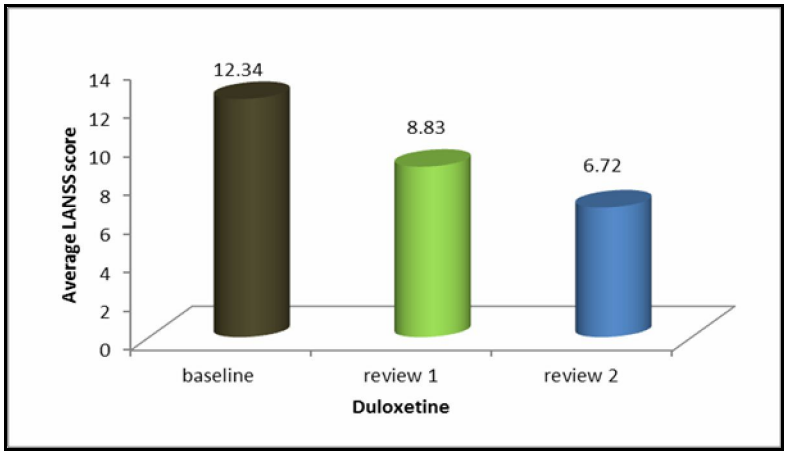


**Figure 6: Neuropathic Pain Score using LANSS Scale**

The mean and SD changes of pain found by using DN4 Questionnaire was 4.55 ± 0.64 (baseline); 3.23 ± 0.71 (Review 1) and 2.37 ± 0.87 (Review 2) respectively. There was a reduction in the DN4 Questionnaire in the patients from 4.55 (baseline) to 2.37 (Review 2) respectively (Figure 7).

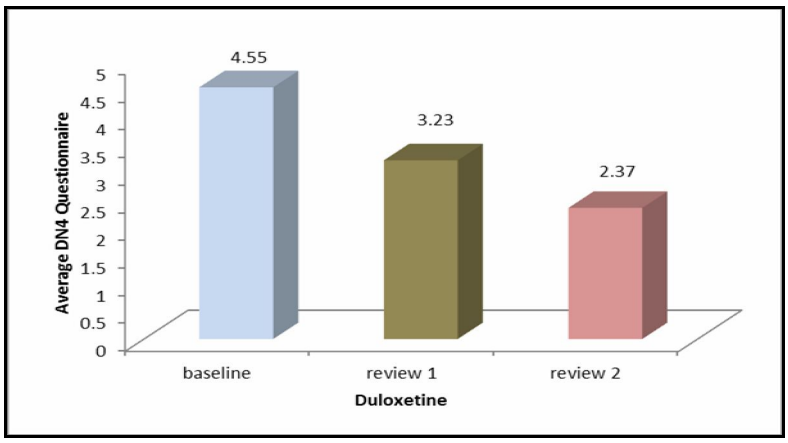


**Figure 7: Neuropathic Pain Score using DN4 Questionnaire**

**Safety**

Adverse reaction was reported in 21 patients, that were mild, self limiting, and did not require the discontinuation of therapy. Adverse reaction such as Somnolence, Giddiness and Insomnia were reported with Duloxetine. On review, out of 50 patients – 14 (28 %) patients reported with somnolence, 4 (8 %) patients with giddiness and 3 (6 %) patients reported with insomnia (Figure 8).

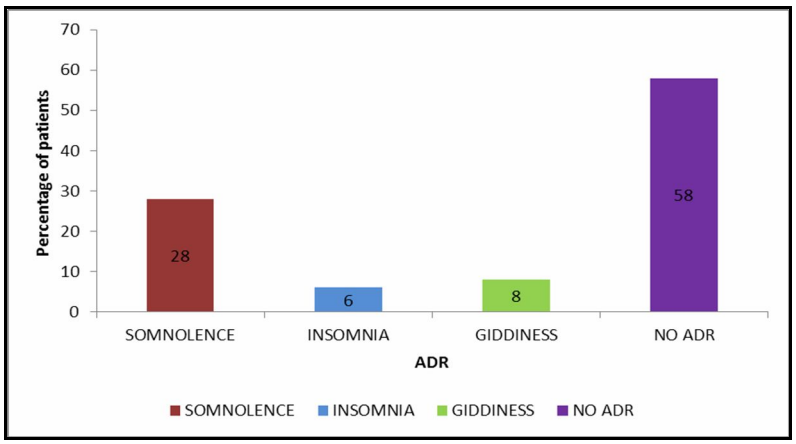


**Figure 8: Adverse Effects Observed in Duloxetine Patients**

## Conclusion

The current study compared the efficacy and safety of Duloxetine in patients with all types of neuropathic pain. In our study, Duloxetine has shown a better relief in neurological symptoms over a 1 month of follow-up. Hence we conclude that Duloxetine is safe and effective in patients with different types of neuropathic pain.

## Acknowledgement

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