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**ORIGINAL ARTICLE**

# Amitriptyline, Pregabalin, and Gabapentin: Efficacy and Safety in Neuropathic Pain Treatment: A Single Center Study

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## ABSTRACT

**Background:** Pregabalin and gabapentin, two tricyclic antidepressants (TCAs), often treat NeP symptoms. Currently, these drugs are used to treat a disease known as neuropathic pain (NeP). Today, neuropathic pain treatment generally falls short of expectations.

**Methods:** This single-center study was conducted in territory care hospital Lrh Peshawar from February 2021 to February 2022. Pregabalin and gabapentin, two tricyclic antidepressants (TCAs), are often used to treat NeP symptoms. Currently, these drugs are used to treat a disease known as neuropathic pain (NeP). Today, neuropathic pain treatment generally falls short of expectations.

**Results: "**At two months, Group A had a mean NPRS score of 03.70, Group B of 03.61, and Group Cof 05.20. The p-value was [0.001], and the statistically significant F-value was 06.61. Group 03 participants saw a significant difference between themselves and the other two treatment groups. The 11 patients in group B (24%) reported significantly more negative side effects, such as dizziness, as compared to the 04 patients (13%) in group A and the four patients (04.37%) in group C [p=0.040]. Sedation was present in 14 patients in group B (31.17%), which was a significant increase from group A's 23 patients (25%) and group C's 22 patients (23%) [P=0.035]."

**Conclusions:** Among those with [NeP] As a consequence, 03 drug classes [gabapentine], [pregabaline], and [amitriptyline], each had an identical impact on NeP pain management. Regarding the Numeric Pain Rating Scale (NPRS) score, pregabalin performs better than gabapentine and amitriptyline. Since gabapentin has less long-term adverse effects than other medications, patient compliance is greater.

**Keywords:** Neuropathic pain, gabapentine, amitriptyline, pregabalin

## INTRODUCTION

07–11% of people have neuropathic pain, which is brought on by an infection or injury to the somatosensorysystem, which is made up of core neurons and peripheral fibers (A, A, and C strands). [1] the difficulty of treating neuropathic side effects, their complexity, and their powerless outcomes alternatives are all factors that add to the stress of chronic neuropathic pain. The sadness caused by the real aggravation and the infection that is causing it, as well as the increasing medicine doses and doctor appointments, all limit individuals with neuropathic pain from experiencing personal satisfaction.A well-known analgesic and anticonvulsant drug is pregabalin.(FDA) has given Pregabalin the first supporting designation for treating post-herpetic neuralgia and neuropathic pain. According to preclinical and clinical trials, Pregabalin is effective in treating neuropathic pain [6]. [7] Pregabalin has been proven in clinical tests to effectively reduce pain and its associated side effects when used alone or in conjunction with analgesics. The main advantages of Pregabalin are its relative dependability, simplicity in administration, and high resistance in patients with neuropathic pain. [8] Gabapentin (GBP) is often used to treat post-herpetic neuralgia (PHN). The alpha-2-delta subunit of voltage-gated calcium channels, present in the peripheral and central neurological systems, is where GBP may bind most specifically. As a consequence, it has an impact on synapses and reduces nerve cell activation. [9] That's it.

Component of exercise that might help people with neuropathic pain by reducing their discomfort. [10] The tricyclic stimulant amitriptyline is often used to relieve chronic neuropathic pain. Amitriptyline is known to impede the reuptake of serotonin and noradrenaline, but its precise mechanism of action in treating neuropathic pain is still unclear. [11] Since the absence of pain with antidepressants is often attained at lower measurements than the start of any stimulating action, the instrument will likely differ from that in grieving. [12, 13]

## METHODS

This single Center Study was conducted in territory care hospital Lrh Peshawar from February 2021 to February 2022 in the Neurology OPD and hospital-visited patients. Pakistan Patients of any gender over 20 are eligible. Neuropathy is caused by spinal cord damage, post-herpetic neuroglia, low back discomfort, and diabetic peripheral neuropathy. The study excludes those with diabetes, T.B., renal, liver, or heart problems. Nursing or pregnant ladies. Immunocompromised patients. Medicine hypersensitive people Learn: Three groups of 150 neuropathic pain patients were randomly assigned. Group A got gabapentine (300 mg). Group B got 75 mg pregabalin. Group C got 10 mg amitriptyline. The numeric pain rating scale measured pain on the trial's first, 14th, and 28th days (NPRS). ADRs: reporting adverse medication reactions ADR reporting forms documented patient or clinician observations throughout the investigation. Stats: A Master chart was created when data was entered into EXCEL. SPSS version 24 analyzed the data. Values and percentages represented qualitative data. Mean, and S.D. described quantitative data. ANOVA compared the three groups' mean numerical pain ratings. They compared two groups over time using the Tukey Post Hoc test. The Chi-square test analyzed adverse medication responses in all three research groups. Thep-value was tested at 5% significance.

## RESULTS

There were 45 patients in total across both groups. 40 (59%) men and 15(41%) females made up Group A.In Group B, there were 16 girls (43%) and 20 men (57%). 14 ladies (40%) and 20 men (57%) made up Group C. results shown in tables 01 to 05

Table 1: gender-based distribution of patients

| [Gender] | [Group A] | [Group B] | [Group C] |
|---|---|---|---|
| [1]. Male | 20 (59 %) | 20 (57 %) | 20 (57 %) |
| [2]. Female | 10 (41 %) | 15 (42 %) | 15(48%) |
| Total | 30(100 %) | 35 (100%) | 35 (100%) |

The median age of the patients in Group A was 52.35 6.35 years. The median age of the patients in group B was 52.23 and 6.46 years. In group C, patients' ages ranged from 52.46 to 5.32 on average. The p-value was 0.631, and the F-value was 0.321 regarding statistics. (Table 2) "Peripheral neuropathy was the most common clinical Diagnosis for pain among patients in groups A, B,

and C of ability 03."

Table 2: Patient Distribution of Age Group

| [Age-group] | [Group A] | [Group B] | [Group C] |
|---|---|---|---|
| [1].20-41 | 08 | 07 | 06 |
| [2].42-62 | 11 | 13 | 13 |
| [3].>62 | 11 | 15 | 16 |
| [4]. Total | 30 [100 %] | 35 [100 %] | 35 [100 %] |
| [5]. Mean SD | 52.35 ± 06.35 | 52.23± 6.46 | 52.46 ± 5.32 |
| F-value | 0.320 | | |
| p-value | 0.631 | | |

Table 3: Patients Diagnoses in this study

| [Diagnosis] | [A] | [B] | [C] |
|---|---|---|---|
| 1. Peripheral neuropathy | 14 | 16 | 15 |
| 2. Diabetic peripheral neuropathy | 07 | 08 | 07 |
| 3.Trigeminal neuralgia | 04 | 04 | 05 |
| 4. Central pain after stroke | 4 | 03 | 04 |
| 5. Post-herpetic neuralgia | 1 | 01 | 01 |
| 6. Myelopathy pain | 1 | 01 | 01 |
| 7.Central neurogenic pain | 1 | 01 | 0 |
| 8. Reflex sympathetic dystrophy | 0 | 01 | 01 |
| 9. Others | 1 | 0 | 01 |

Table 4: Comparison of baseline scores on the Numeric Pain Rating Scale (NPRS) after 15 and 30 days forall three groups (ANOVA).

| | | Mean±SD | p-value |
|---|---|---|---|
| Baseline | Group A | 07.82 ± 01.51 | 0.434 |
| | Group B | 07.95 ± 01.61 | |
| | Group C | 07.92 ± 01.61 | |
| After 14days | Group A | 05.11 ± 01.41 | 0.060 |
| | Group B | 05.22 ± 01.31 | |
| | Group C | 06.21 ± 01.41 | |
| After 28 days | Group A | 03.10 ± 01.03 | 0.002 |
| | Group B | 03.62 ± 01.01 | |
| | Group C | 04.23 ± 01.02 | |

S (for significant), N.S. (not substantial), and NPRS (not statistically significant) are all abbreviations denoting levels of statistical significance (Numeric Pain Rating Scale).

Table 5: Adverse drug responses in each of the three groups of people

| Groups | A | | B | | C | | (Chi-square) | (p-value) |
|---|---|---|---|---|---|---|---|---|
| | N | % | n | % | n | % | | |
| Dizziness | 04 | 13 | 08 | 22 | 01 | 03 | 04.32 | 0.035 |
| Sedation | 08 | 23 | 11 | 33 | 08 | 25 | 06.57 | 0.020 |
| Constipation | 01 | 01 | 0 | 00 | 03 | 09 | 08.56 | 0.000 |
| Dry mouth | 0 | 00 | 0 | 00 | 04 | 05. | 10.37 | 0.000 |

Compared to group A's four patients (13%), group C's two patients (03%), and group C's two participants present study in this study, **(B)** have a higher proportion of patients who had dizziness (8 patients; 22%) [p=0.035]. Sedation rates were significantly greater in group B (11 patients, 33%) than in group A (05 patients, 13%)or group C (08 patients, 23%) [P=0.020]. 03 patients in group C (09%) reported having constipation, which was significantly more than the 0 patients in groups A and B (0%) [p=0.000]. With 0 patients (0%) and seven patients (12%) in Groups A and B, respectively, Group C exhibited a significantly greater incidence of dry mouth (P=0.000).

## DISCUSSION

"Some more frequent causes of pain include back pain, diabetes (painful diabetic neuropathy), post-surgical pain, HIV/AIDS, and herpes zoster (post-herpetic neuralgia)". However, various other illnesses or traumas may also bring them on. [13] Clinical manifestations include paresthesia, piercing or shooting pains, altered feeling (numbness, allodia, or hyperalgesia), and locally altered autonomic function. [14-17] This research's two-month mean pain ratings significantly decreased in all three groups. Patients using gabapentin saw a considerable reduction in their mean pain score, from 8.31 to 03.71. This finding was consistent with Gilron et al. studies .'s [18]. Users of Pregabalin

They reported much less pain, with scores ranging from 08.42 to 03.63. This result was in line with what Holbech et al. found. [19] The mean pain score for patients on amitriptyline was lower than 08.28 to 05.20. No other trial used amitriptyline to treat persistent lumbar radiculopathy pain and was as successful. The mean pain score between Group A and Group B did not vary statistically significantly from the mean painscore between Group A and Group C, nor did the mean pain score between Group A and Group D differ statistically significantly from the mean pain score between Group A and Group D.The study found that the pregabalin and amitriptyline treatment groups had more adverse drug reactions than the gabapentin group. In the present study, group B had significantly more patients with dizziness than group A or group C (0 patients in group C and eight patients in group B, respectively; [p=0.035]). Sedation rates were significantly greater in group B (23 patients, 33%) than in group A (9 patients, 13%) or group C (08 patients, 23%) [P=0.020]. 03 patients in group C (09%) reported having constipation, which was significantly more than the 0 patients in groups A and B (0%) [p=0.000]. With 0 patients (0%) and three patients (12%) in Groups A and B, respectively, Group C exhibited a significantly greater incidence of dry mouth [p=0.000].

## CONCLUSION

Consequently, persons suffering from (NeP) may benefit from three pharmacological classes:gabapentin, Pregabalin, and amitriptyline. According to the Numeric Pain Rating Scale, Pregabalin outperforms Gabapentin and Amitriptyline (NPRS). Patient compliance will gradually improve since gabapentin has fewer side effects. Pregabalin is more costly than amitriptyline, which should beconsidered when treating patients.

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