

Efficacy of Gabapentin for Pain and Anxiety in Children

Samra Liaqat, Asad Mahmood Khan, Sana Tufail, Ghulam Abbas Tahir, Saad Maroof Saeed, Raima Mazhar

ABSTRACT

Objective: To determine the efficacy of gabapentin for pain and anxiety control in children. **Study Design:** This was a descriptive cases series. **Settings:** Tehsil Head Quarter Hospital, Chak Jhumra Faisalabad Pakistan. **Duration:** Six months from July 2017 to December 2017. **Methodology:** In this study, children of both genders with age range of 03 to 12 years were included. The cases were included that were undergoing for minor or major surgical procedures at pediatric departments. The cases allergic to drug and with no consent from the parent or guardian were excluded. The gabapentin was given in a dose of 15 mg/kg/day and they were assessed for the pain and anxiety. The efficacy in terms of pain was labelled as yes where the pain on visual analogue scale was less than 4 and in terms of anxiety when on anxiety scale the score was less than 4. The final results were assessed at 12 hours of post procedure. **Results:** In this study, total 100 children out of which 65 (65%) were males and 35 (35%) females with mean age of 6.34 ± 2.21 years. The mean weight of the participants was 19.11 ± 6.23 kg. The mean pain and anxiety score observed were 3.76 ± 1.02 and 3.01 ± 0.97 respectively. The efficacy in term of pain relief was seen in 73 (73%) and anxiety relief was seen in 78 (78%) of the cases. **Conclusion:** Gabapentin is significantly better drug, in reduction of pain and anxiety both in paediatric population.

Keywords: Gabapentin, Pain, Anxiety

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Submitted for Publication: 11-08-2019

Accepted for Publication: 29-09-2019

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Citation: Liaqat S, Khan AM, Tufail S, Tahir GA, Saeed SM, Mazhar R. Efficacy of Gabapentin for Pain and Anxiety in Children. APMC 2019;13(3):213-5.

INTRODUCTION

Gabapentin is one of the most popularity gaining drug in the recent times and have shown a wide range of clinical benefits and pharmacological use. It was first licenced by United States Food and Drug Administration (FDA) for use in children that had partial seizure activity back in 1990s. Later on, it was approved for post-herpetic neuralgia in early 2000. Its recent use for extensive off label consumption for use in various psychiatric disorders especially in anxiety.¹⁻²

The basic pharmacology for the Gabapentin use includes the production of γ -aminobutyric acid (GABA) neurotransmitter; although having a structural similarity with it, it does not affect the GABA uptake or degradation. The molecular mechanism of gabapentin is binding at the $\alpha_2\delta_1$ subunit of Ca^{2+} channels affecting Ca^{2+} currents; hence leads to reduction of substance P and glutamate and can benefit for pain and seizures.³⁻⁴

Gabapentin is metabolized in liver and shows very little drug interaction and also has shown good efficacy with a minimal side effect profile. This drug has shown its range of therapeutic use either alone or in combination of various drugs for pain, seizure and psychiatric disorders and recently in the latter group, it has shown great efficacy in post-traumatic stress disorder, drug abuse, anxiety and alcohol withdrawal. In paediatric population, there seems to be no long-term effects of it impacting mental or physical growth or side effect profiles.⁵⁻⁶

METHODOLOGY

Study Design: Descriptive case series.

Settings: DHQ Hospital, Faisalabad Pakistan.

Study Duration: July 2017 to December 2017

Sampling Techniques: Non probability consecutive sampling.
Inclusion Criteria: In this study, children of both genders with age range of 03 to 12 years were included. The cases were included that were undergoing for minor or major surgical procedures at pediatric departments.

Exclusion Criteria: The cases allergic to drug and with no consent from the parent or guardian were excluded.

Methods: The gabapentin was given in a dose of 15 mg/kg/day and they were assessed for the pain and anxiety. The efficacy in terms of pain was labelled as yes where the pain on visual analogue scale (VAS). (A scale where the patient is asked to rate his pain on a grade of 0 to 10 where 0 labelled as no pain and 10 as highest degree of pain). The score less than 4 on VAS and in terms of anxiety when on anxiety scale the score was less than 4. The final results were assessed at 12 hours of post procedure.

Statistical Analysis: The data was entered and analyzed by using Statistical package for social sciences (SPSS)-version 23. Frequency and percentage were calculated for categorical data and mean and standard deviation for nominal data. Post stratification Chi square test was applied taking p value of ≤ 0.05 as significant.

RESULTS

In this study, were total 100 children out of which 65 (65%) were males and 35 (35%) females with mean age of 6.34 ± 2.21 years as shown in table 1 & 2.

Table 1: Demographics

	Mean	Range
Age (years)	6.34±2.21	3-12
Weight (kg)	19.11±6.23	8-32
Duration of surgery (mints)	17.11±5.44	5-35

Table 2: Study variables

Variable	Number	Percentage
Male	65	65%
Female	35	35%
Minor surgery	71	71%
Major surgery	29	29%

The mean weight of the participants was 19.11±6.23 kg. The mean pain and anxiety score observed were 3.76±1.02 and 3.01±0.97 respectively as in table 03.

Table 3: Pain and Anxiety scores in study subjects

	Mean	Range
Pain	3.76±1.02	0-8
Anxiety	3.01±0.97	0-7

The efficacy in term of pain relief was seen in 73 (73%) and anxiety relief was seen in 78 (78%) of the cases as shown in figures I and II.

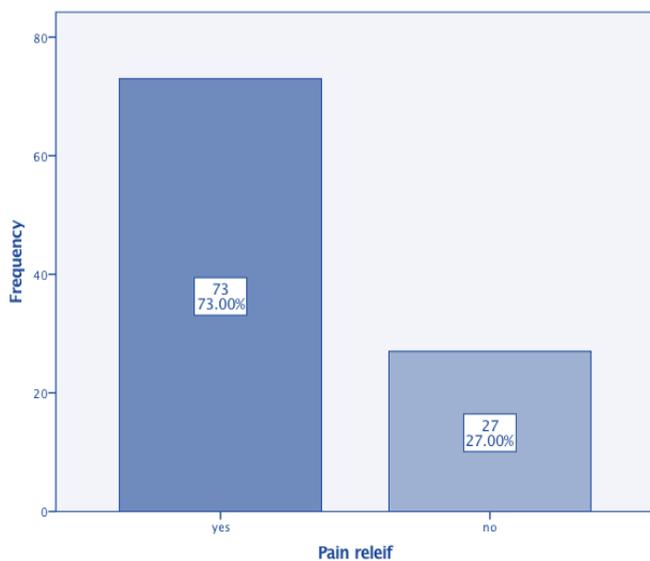


Figure 1: Efficacy in terms of pain relief

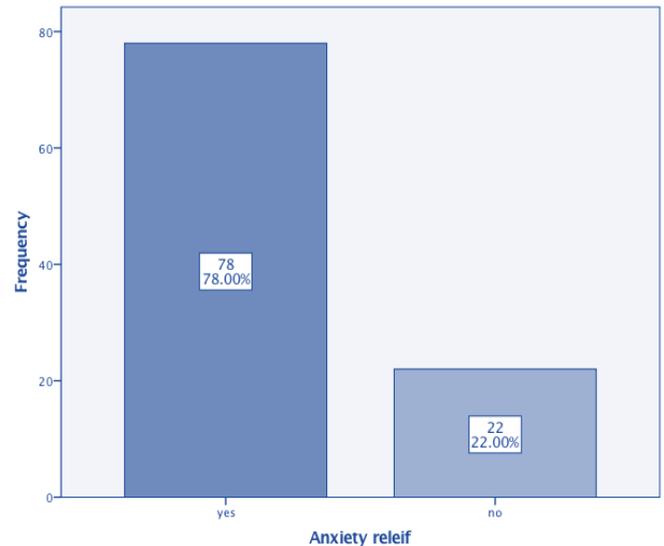


Figure 2: Efficacy in terms of anxiety relief

DISCUSSION

Gabapentin drug is now among the extensive used drugs in surgical and psychiatric paediatric departments. They are considered as an integral part of multimodal analgesia and also reduction of anxiety in kids undergoing surgery and various procedures; hence improving compliance and clinical outcome. In the present study the Gabapentin have shown significant reduction in anxiety and was seen in 78 (78%) of the cases with mean anxiety score of 3.01±0.97. This finding was consistent with the results conducted in a double blind trial conducted by Pande et al where they assessed the efficacy of this in reduction of anxiety and social phobia and it was observed that this led to significant reduction as compared to placebo (p< 0.05).⁷

This was also proved in another trial on 103 cases and it was seen that the efficacy was highest in cases that had highest reading on anxiety scale as compare to those with subtle changes.⁸ Tirault et al. have also shown after comparing with placebo and hydroxyzine that gabapentin are superior to all in reducing pre- surgery anxiety.⁹

The significant pain reduction was seen in 73 (73%) of the cases in the present study. In 2010, Rusy et al. analysed the efficacy of gabapentin as analgesic drug and found that the cases that were receiving this had significant less usage of morphine as reliever than to placebo (0.044 + 0.017 mg/kg/hr vs 0.064 + 0.031 mg/kg/hr in the controls, p = 0.003). This difference was also significant on postoperative day 1 (0.046 + 0.016 vs 0.055 + 0.017, p = 0.051) and on day 2 with p = 0.018). Pain scores were significantly lower in the gabapentin group while in the recovery room (2.5 + 2.8 vs 6 + 2.4, p < 0.001) and the mean pain score in the present study were 3.76±1.02.¹⁰

This was also reported by the studies in Amani S et al. where they compared different modalities with gabapentin in children undergoing tonsillectomy. At 12 hours, the mean pain score values were 1.6 + 1.3 with gabapentin 3.1 + 2.5 with bupivacaine, and 2.5 + 1.8 with meperidine with p = 0.008.¹¹ The reason for higher degree of relief in pain and anxiety by

gabapentin can be explained by the factor that it not only relieves pain by acting on GABA receptors but also lead to sedation and lead to sleep which also help overcome the anxiety state.

CONCLUSION

Gabapentin is significantly better drug, in reduction of post-operative pain and anxiety in paediatric population.

LIMITATION OF STUDY

We have checked post-operative pain and anxiety in minor surgeries only.

FUTURE SUGGESTIONS

In future studies we can see efficacy of gabapentin in major surgeries and in large number of children.

CONFLICT OF INTEREST

We have no conflict of interest among the authors.

ACKNOWLEDGEMENTS

I wish to express my sincere thanks to Dr Muhammad Ahmad, Assistant professor, Umar critical care unit, Lahore for helping me in statistical analysis.

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