**EXPERIMENTAL STUDIES OF THE ANALGESIC EFFECT OF PREGABALIN**

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**Introduction**

Pregabalin is an alkylated analogue of GABA effective in the treatment of several disorders, including epilepsy, hyperalgesia, behavior disorders, generalized anxiety disorder and social phobia. Pregabalin exert antinociceptive effects in various experimental models of acute and chronic pain, reduce neuropathic pain in patients with diabetic neuropathy and post-herpetic neuralgia[1]. It is considered more effective in difficult pain management associated with stress[2].

**Aim**

Our aim is to investigate the analgesic effect of pregabalin on acute models of pain on rats.

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**Material and methods**

- Male Wistar rats, divided into 5 groups (n = 8), were treated i.p. with:
  - 1st group – saline (control group) 0.1 ml/100 g bw
  - 2nd group – metamizole sodium (positive control group) 150 mg/kg bw
  - 3rd group – pregabalin 100 mg/kg bw
  - 4th group – pregabalin 200 mg/kg bw
  - 5th group – pregabalin 400 mg/kg bw

- Three nociceptive tests were used – hot-plate test, analgesimeter test (Randall – Selitto paw pressure test) and formalin test.

- The statistical calculations were done by One way ANOVA of SPSS19.

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**Results**

1. In hot-plate test pregabalin at the three doses used increased significantly the latency of reaction. At 60th min pregabalin at dose 400 mg/kg produced the maximum effect compared to the control (p ≤ 0.001) and significant antinociceptive effect compared to metamizole (p ≤ 0.05). (Fig. 1)

2. In analgesimeter test the latency of reaction reached higher levels for the three doses of pregabalin compared to the control on 60th and 120th min of testing. Significant difference was only observed at 120th min with the highest effect at 400 mg/kg pregabalin compared to the control (p ≤ 0.001). At 180th min pregabalin reversed the mechanical hyperalgesia at dose 200 and 400 mg/kg compared to the control. (Fig. 2)

3. In the formalin test pregabalin at the three doses used significantly and dose-dependently reduced paw licking in the early (0-10 min) and in the late phase (20-30 min after formalin injection) compared to the control. The maximal pain inhibition was at 400 mg/kg compared to the control in the early (p ≤ 0.01) and in the late phase (p ≤ 0.001). (Fig. 3)

**Conclusion**

Our data demonstrated that pregabalin has analgesic activity in the nociceptive tests. It caused dose-related antinociception in chemical, thermal and mechanical models of pain in rats.

**References**


*There is no potential conflict of interest.*
Experimental studies of the analgesic effect of pregabalin

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\textbf{Purpose:} Pregabalin is an alkylated analogue of GABA effective in the treatment of several disorders, including epilepsy, hyperalgesia, behavior disorders, generalized anxiety disorder and social phobia. Pregabalin exert antinociceptive effects in various experimental models of acute and chronic pain, reduce neuropathic pain in patients with diabetic neuropathy and post-herpetic neuralgia [1]. It is considered more effective in difficult pain management associated with stress [2]. The purpose of present study is to investigate the analgesic effect of pregabalin on acute models of pain on rats.

\textbf{Methods:} Male Wistar rats, divided into 5 groups (n=8), were treated intraperitoneally as follows: 1\textsuperscript{st} group – with saline (control group) 0.1ml/100g bw; 2\textsuperscript{nd} – with metamizole sodium (positive control group) 150mg/kg bw; 3\textsuperscript{rd}, 4\textsuperscript{th} and 5\textsuperscript{th} group with pregabalin 100, 200 and 400mg/kg bw respectively. Analgesic effect was studied using hot-plate test, Randall-Selitto paw pressure test, quantifying the antinociception as percentage of maximal possible effect (MPE\textsubscript{a}), and formalin test quantifying cumulative licking time. The statistical calculations were done by One way ANOVA of SPSS.19.

\textbf{Results:} In hot-plate test pregabalin at dose 100mg/kg produced significant antinociceptive effect compared to the control at 60\textsuperscript{th} and 120\textsuperscript{th} min after treatment. MPE\textsubscript{a} of pregabalin at doses 200 and 400mg/kg after 60min, 120min and 180min was increased significantly compared to the control and the analgesic effect is higher compared to the positive control at the same hour. At 60\textsuperscript{th} min pregabalin at dose 400mg/kg produced the maximum effect compared to the control (94±5.8\% v/s 12±2.1\%, p<0.001) and a significant antinociceptive effect compared to metamizole (94±5.8\% v/s 55±8.7\%, p<0.05). Results indicate that pregabalin produce dose-related antinociceptive effect. In Randall-Selitto paw pressure test MPE\textsubscript{a} reached higher levels compared to the control for the three doses of pregabalin after 60 and 120min. Significant difference was only observed at 120\textsuperscript{th} min with the highest effect at 400mg/kg pregabalin compared to the control (85±5.6\% v/s 17±5.4\%, p<0.001). At 180\textsuperscript{th} min pregabalin reversed the mechanical hyperalgesia at dose 200 and 400mg/kg compared to the control. Data show that the analgesic effect is dose dependent. In the formalin test pregabalin at the three doses significantly and dose-dependently reduced the licking time during the early (0–10min) and during the late phase (20–30min after formalin injection) compared to the control. The maximal pain inhibition was at 400mg/kg compared to the control during the early (20±4.2s v/s 52±10.7s, p<0.05) and during the late phase (14±4.5s v/s 63±7.3s, p<0.001). Pregabalin at doses 100, 200 and 400mg/kg in both phases produced a significant and a comparative antinociceptive effect as similar to metamizole.

\textbf{Conclusions:} Our data demonstrated that pregabalin has analgesic activity in the nociceptive tests. It caused dose-related antinociception in chemical, thermal and mechanical models of pain in rats.


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\textbf{Keywords}

Neuropharmacology
Behavioural pharmacology
Animal behaviour