PERSPECTIVE PHARMACEUTICAL COMPOSITION OF COXIB WITH CAFFEINE – EXPERIMENTAL STUDIES OF MNESTIC ACTIVITY OF RATS IN CONDITIONS OF FORMALINE EDEMA

Syrova Ganna
Ph.D. (Doctor of Pharmaceutical Sciences), Professor, Professor
Kharkiv National Medical University

Lukianova Larysa
PhD (Candidate of Pharmaceutical Sciences), Associate Professor,
Kharkiv National Medical University

Prysiazhnyi Oleksandr
PhD (Candidate of Technical Sciences), Assistant
Kharkiv National Medical University

Krasnikova Julia
senior laboratory assistant
Kharkiv National Medical University

Our earlier experimental studies of the biological activity of 1,3,7-trimethylxanthine (caffeine) proved that it affects the analgesic, anti-inflammatory and other pharmacological effects of nonsteroidal anti-inflammatory drugs (NSAIDs) of various chemical structures, including coxibs, which are one from the most modern groups of NSAIDs [1-4]. Also in previous studies, we studied the effect of 4-[5-(4-methylphenyl)-3-(trifluoromethyl)-pyrazol-1-yl]benzenesulfonamide (celecoxib) and 3-phenyl-4-(4-(methylsulfonyl)phenyl)-2-(5H)-furanone (Rofecoxib) on the mnestic activity (MA) of the brain of rats in conditions of formalin edema (FE) according to the influence on the conditioned reaction of passive avoidance (CRPA). According to the effect on MA (CRPA) in rats, the leader of the study was celecoxib, which was administered to animals intragastrically at a dose of 5 mg/kg – its effect exceeded the reference drug 2-[(2,6-dichlorophenyl)amino]-phenyl]acetate (Diclofenac Sodium) (8 mg/kg), and rofecoxib (1.5 mg/kg) had a weaker effect on MA in rats in conditions of FE [5].

The study of the effect of Caffeine on the MA of rats in conditions of FE, to which the studied coxibs were administered, has not been previously studied. Therefore, our purpose was to investigate the effect of the introduction of a known adjuvant on the MA of rats in conditions of FE, which were administered intragastrically Rofecoxib (1.5 mg/kg) and Celecoxib (5 mg/kg) as an NSAIDs. We chose Diclofenac Sodium (8 mg/kg) as the reference drug. The introduction of the pharmaceutical composition of Rofecoxib (1.5 mg/kg) with Caffeine (0.6 mg/kg) contributed to an increase in the number of animals that learned up to 100%, which was 33% higher than the effect of

mono-administration of Rofecoxib – the number of animals in which short-term memory (STM) was formed was 100%, which was 50% higher than the effect of mono-administration of Rofecoxib under these conditions experiment.

The percentage of animals was 100% – both when Celecoxib was of mono-administration and when its pharmaceutical composition with Caffeine was administered. The percentage of animals in which STM was formed decreased by 50% when the pharmaceutical composition of Celecoxib with caffeine was administered (33%) compared to monoadministration of Celecoxib (83%).

Thus, we investigated the effect of Caffeine on CRPA in rats in conditions of FE when administered coxibs. The addition Caffeine to Rofecoxib or Celecoxib contributed to 100% formation of CRPA in rats in conditions of FE, which exceeded the effect of administration of the reference drug (83%). Preservation of CRPA after 1 hour occurred when the pharmaceutical composition of Rofecoxib with Caffeine was administered – STM was formed in 100% of rats, which is 50% more than when Rofecoxib was monoadministration and 33% more than when Diclofenac Sodium was administered.

Unfortunately, there was no positive effect of caffeine on the preservation of STM in rats administered Celecoxib against conditions of FE – STM was formed in only 33% of rats, which was at the level of the control pathology group and the Caffeine monoadministration group.

Therefore, promising pharmaceutical composition regarding MA, we considered Rofecoxib with Caffeine, which was studied by CRPA in rats in conditions of FE.

References:

1. G.O.Syrova Investigation of the analgesic and antiexudative activity of the pharmaceutical composition of 4-[5-(4-methylphenyl)-3-(trifluoromethyl)-pyrazol-1-yl]benzenesulfonamide with caffeine / G.O.Syrova, N.M.Chalenko, V.M.Petyunina // Modern aspects of achievements of fundamental and applied medical and biological directions of medical and pharmaceutical education and science: materials of the 1st scientific and practical internet conference with international participation, which is dedicated to the 90th anniversary of the birth of Professor L.T.Kyrychok (Kharkiv, November 17, 2021) / Ministry of Health of Ukraine, Kharkiv National Medical University. – Kharkiv: KhNMU, 2022. – P. 178-181.

2. Anti-Inflammatory Effect of Coxibs and their Compositions with Caffeine on the Level of Conjugated Dienes in the Formalin-Induced Edema Model / G.Syrova, V.Petiunina, O.Savelieva, T.Tishakova, L.Lukianova // Journal of the Turkish Chemical Society. – 2022. – Volume 9, issue 4. – R. 1029-103 (journal of the Scopus database)/

3. The studying of analgesic activity of new pharmaceutical composition in the experiment / Syrova G., Chalenko N., Levashova O., Khaustova M., Gaichjuk A. // The 10th International scientific and practical conference "Modern methods of applying scientific theories" (March 14-17, 2023) Lisbon, Portugal. International Science Group. 2023. P. 297-303.

4. Experimental study of the peripheral component of the analgesic activity of pharmaceutical compositions of coxibs with caffeine / G.Syrova, O.Zavada, S.Kozub // Science and innovation of the modern world. Proceedings of the 7th International scientific and practical conference. Sognum Publishing House. London, United Kingdom. March 23-25, 2023. P. 158-164.

5. Syrova G. O. Experimental study of the effect of coxibs on the central nervous system of rats in conditions of formalin edema / G.O.Syrova, N.M.Chalenko, O.V.Prysiazhnyi // World of scientific research. – Issue 17: collection of scientific publications of the International Multidisciplinary Scientific Internet Conference, Ternopil, Ukraine – Perevorsk, Poland, March 16-17, 2023 / Scientific Community NGO, WSSG w Przeworsku. – Ternopil; Prevorsk, 2023. – P. 226-227.