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LETTER

Letter to the Editor Regarding "Advantages of the Combination of Conscious Sedation Epidural Anesthesia Under Fluoroscopy Guidance in Lumbar Spine Surgery" [Letter]

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Dear editor

Recently, Kang et al[1] released a paper in the Journal of Pain Research, entitled "Advantages of the Combination of Conscious Sedation Epidural Anesthesia Under Fluoroscopy Guidance in Lumbar Spine Surgery." The results mentioned in the original paper[1] are inaccurate due to the fact that the authors did not take into account the physical-chemical factors of local interaction of drug solutions that affect their local pharmacokinetics at the injection sites. Essentially an article by Kahn et al[1] is devoted to the study of the peculiarities of the local action of drug solutions when injected into soft tissues in the spine. The data search strategy included the relationship between the duration of local anesthesia retention and the patient's age. Such factors of local action as the concentration, volume, pH of the drugs solutions were not taken into account. It is not possible to repeat results in the original article[1] using the same methods. In the section "Anesthesia technique and postoperative course" it is indicated that " … a single injection of the mixture was administered 5–10 mL of half of 0.325% ropivacaine with epinephrine 1:200,000, diluted in 5–10 mL of radiocontrast dye (BONOREX®) (Figure 1)."

Firstly, it is impossible to accurately assess the reason for the duration of the pharmacological effect in the original article,[1] without taking into account, at least, the exact value of the concentration of ropivacaine in the mixture and the exact value of its volume when injected after dilution of 5–10 mL solution of local anesthetic in 5–10 mL solution of radiocontrast. They needed a different study design. It was necessary to evaluate the effectiveness of two doses of a local anesthetic, namely, in the first group only 5 mL, and in the second group only 10 mL of a solution of half of 0.325% ropivacaine with epinephrine 1:200,000. Moreover, they had to divide each group into 2 additional subgroups: in the first and second subgroups, dilute a solution of the specified local anesthetic in 5 mL and 10 mL of radiocontrast dye (BONOREX®), respectively. By the way, the above proposal is not new and unknown for anesthesiologists, since in earlier similar articles other authors took into account the exact volume and concentration of the local anesthetic solution.[2] In addition, it was necessary to specify a specific radiocontrast drug, its formulation, the concentration of its ingredients and acid (alkaline) activity.

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Secondly, for their study, the authors had to take into account the acid activity of the dilute solution in each of the 4 subgroups, since the acid activity of a solution of 0.325% ropivacaine solution with epinephrine 1:200,000 differs from the acid activity of a solution of radiocontrast dye (BONOREX®). Therefore, the mixture of these drugs in each of the 4 subgroups has a different acidity. In addition, the acid activity of drug solutions may be different for drugs produced by different pharmaceutical companies and in different serial numbers for the same pharmaceutical company.[3] By the way, the value of the acid activity of drug solutions is included in the standard list of controlled indicators of the quality of medicines.[4] In addition, the pH indicator can be determined using a pH-meter in a biochemical laboratory.

In our opinion, Kang et al could provide more accurate and valuable information if they took into account that the mechanism of action of local anesthetics depends on their dose, concentration, volume and acidity of the mixture that is injected into soft tissues.

Moreover, Kang et al the study did not take into account pharmaceutical companies that produced a solution of 0.325% ropivacaine solution with epinephrine 1:200,000, as well as the year of manufacture and the batch number of the drug used. It should be added that the authors did not take into account which radiocontrast drug was used. The fact is that radiocontrast agents used in X-ray examinations can be grouped in positive (iodinated agents, barium sulfate), and negative agents (air, carbon dioxide, methylcellulose). From the standpoint of clinical pharmacology, it is inappropriate to evaluate the pharmacological effect of a mixture prepared by diluting a solution of a certain drug with a solution of an unspecified drug with unknown physical-chemical properties. Determining the actual values of physical and chemical indicators of the quality of solutions for injection can improve the accuracy of research results in the future.

Disclosure

The authors report no conflicts of interest in this communication.

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