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A pharmacokinetic study of a topical anesthetic (EMLA®) in mouse soft tissue laceration

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The use of topical anesthesia instead of injection of local anesthetics for managing soft tissue lacerations in the emergency situations may be a relief for both patients and surgeons. Topical anesthesia in the form of a cream (EMLA®, Astrazeneca, Karlskoga, Sweden) containing 2.5% lidocaine and 2.5% prilocaine has been reported as efficient as anesthetic on skin before venipuncture anesthesia and as an alternative to injection anesthesia in some minor surgery situations. The aim of the study was to compare the pharmacokinetics of EMLA® when applied in a laceration in comparison with topical skin application in the mouse. A total of 120 BABC male mice were divided into three groups with regards to application mode of EMLA®. Group A: with laceration, 48 mice, Group B: on intact shaved skin, 48 mice, Group C: control group, 24 mice, with same procedures but without application of EMLA®. Blood levels were collected at 0, 10, 20, 30, 45, 60, 75 and 90 minutes post EMLA® application. Plasma samples analysis was carried out employing liquid chromatography coupled with tandem mass spectrometric (LC-MS/MS) method and the pharmacokinetic analysis of the mouse plasma samples was estimated by standard non-compartmental methods. The absorption of lidocaine and prilocaine was rapid following application of EMLA® to lacerated and intact mouse skin. C_{max} and AUC values of lidocaine were significantly increased following application of EMLA to lacerated mouse skin by 448.6% and 161.5%, respectively in comparison with intact skin. Similarly, prilocaine's C_{max} and AUC values were also increased by 384% and 265.7%, respectively, following lacerated mouse skin, in contrast to intact skin.

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