

Comparison of Anesthetic Effects of Lidocaine Hydrochloride Gel using Low and High Frequency Ultrasound

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Low-frequency ultrasound has a significant effect on the transdermal permeation of high molecular weight drugs. However, the rate of permeation in pulsed mode is quite low necessitating considerable time to apply the ultrasound. Normally 1MHz of ultrasound was used clinically. 0.5 MHz ultrasound, which is a relatively higher frequency in the low-frequency range, can be applied in high intensity in continuous mode.

1MHz and 0.5MHz ultrasound and a transducer were used to administer an anesthetic drug transdermally on healthy volunteers and transdermal effects *in vitro*. And the anesthetic effects were examined.

The parameters of transdermal factors were evaluated and compared. In surface anesthesia, the phonophoresis group showed a significantly higher pain threshold than the other groups but there was no significant difference between the phonophoresis groups according to the ultrasound frequency. In conduction anesthesia, the 0.5 MHz phonophoresis group showed a significant change in their pain threshold and amplitude of sensory nerve action potential (SNAP) compared with the other groups.