

Preliminary ABSTRACT

Trans-dermal Jet-phoresis for pre-op cutaneous anesthesia

Introduction: Conventional cutaneous numbing using topical xylocaine formulations is an extremely popular practice prior to medical or cosmetic painful procedures obviating the use of sub-dermal needle injections. The question : is it possible to improve cutaneous numbing by increasing the anesthetic effect and shortening the application time ?

Purpose: of the study was to compare prospectively lidocaine jet-phoresis trans-cutaneous anesthesia to EMLA 5% topical cream.

Methods:

Twenty patients that were scheduled to undergo needling roller for upper lip rhytids enrolled into the study. Each patient served as his own control, so all in all, forty upper-lips were studied. Half of the upper lip was coated with EMLA 5% cream for 45minutes and dressed with nylon sheet to obtain maximal anesthetic effect. The contra-lateral portion of the lip was treated with lidocaine 3% jet-phoresis for 5 minutes. Pain in the upper lip was elicited with needling roller uniform applied to the whole of the upper lip. Pain response was measured using standardizes pain ruler.

Results: Jet-phoresis lidocaine pain control was better or comparable to Emla in more than 82% of lips (14 lips better, in 19 lips comparable, and in 7 lips less) these were statistically significant results.

This was further confirmed reversing the sides of the tested lips in the same subjects. We noticed

marked improvement in anesthetic effect using higher 3% lidocaine concentration.

No other significant differences were found between the better responding group compared to the less responding one.

There is controversy regarding the depth of cutaneous penetration and efficacy of the jet-phoresis propelled fluids. Several authors proclaim that jet-phoresis can introduce fluid particles intra-cutaneous in a mesotherapy like fashion.

However, most studies are – retrospective, subjective/qualitative and relied on questioners.

This small prospective study supports our previous observations and demonstrates that jet-phoresis actually penetrates the cutaneous barrier and delivers lidocaine solution with measurable effect.

By extrapolation, comparable size molecules or smaller may be used, this will open vast number of clinical applications such as vitamins trans-dermal delivery, no needle mesotherapy, vaccinations, Botox type anti hyper-hydrosis Rx, and hair growth enhancement

Conclusions: This study indicates that: 1) Jet-phoresis facilitates cutaneous pre-operative anesthesia in a very short 5min application, in contrast to common practiced non-invasive time consuming methods

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- 2) Jet-phoresis concept is painless, soothing experience, and easily applicable in an out-patient office setting
- 3) Many other liquid preparations may be applied using this concept. Mesotherapy like application
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Final ABSTRACT

Trans-dermal Jet-phoresis for pre-op cutaneous anesthesia

Conventional cutaneous numbing using topical xylocaine formulations is an extremely popular practice prior to medical or cosmetic painful procedures obviating the use of sub-dermal needle injections.

There is controversy as to whether or not is it possible to improve cutaneous numbing by increasing the anesthetic effect and shortening the application time using the jet-phoresis concept ? This prospective study was undertaken to compare prospectively

lidocaine jet-phoresis trans-cutaneous anesthesia to EMLA 5% topical cream and answer this question.

Twenty patients that were scheduled to undergo needling roller for upper lip rhytids enrolled into the study. Each patient served as his own control, so all in all, forty upper-lips were studied. Half of the upper lip was coated with 5%EMLA cream for 45minutes and dressed with nylon sheet to achieve maximal anesthetic effect. The contra-lateral portion of the lip was treated with lidocaine 3% jet-phoresis for 5 minutes. Pain in the upper lip was elicited with needling roller uniformly applied to the whole of the upper lip. Pain response was measured using standardizes pain ruler.

There was a statistically significant advantage of pain control in the lidocaine jet-phoresis group compared to the Emla group ($p<0.005$). Jet-phoresis lidocaine pain control was better or comparable to Emla cream, in more then 82% of lips (In 14 lips better, in 19 lips comparable, and in 7 lips less).

This was further confirmed reversing the sides of the tested lips in the same subjects. We notices marked improvement in anesthetic effect using higher 3% lidocaine concentration.

No other significant differences were found between the better responding group compared to the less responding one.

There is controversy regarding the depth of cutaneous penetration and efficacy of the jet-phoresis propelled fluids. Several authors proclaim that jet-phoresis can introduce fluid particles intra-cutaneous in a mesotherapy like fashion.

However, most studies are – retrospective, subjective/qualitative and relied on questioners.

This small prospective study supports our previous observations and demonstrates that jet-phoresis actually penetrates the cutaneous barrier and delivers lidocain solution with measurable effect.

By extrapolation, comparable size or smaller molecules may be used, this will open vast number of clinical applications such as vitamins trans-dermal delivery, no needle mesotherapy, vaccinations, Botox type anti hyper-hydrosis therapy, and hair growth enhancement

This study confirmed that : 1) Jet-phoresis facilitates cutaneous pre-operative anesthesia in a very short 5min application, in contrast to common practiced non-invasive time consuming methods, and 2) Jet-phoresis concept is painless, soothing experience, and easily applicable in an out-patient office setting.