

Effect Of Transdermal Microneedle Patch With NSAID In Osteoarthritic Knee

Orthopaedics / Knee & Lower Leg / Miscellaneous

Saradej Khuangsirikul, Mongkon Pisuttananwat, Danai Heebthamai, **Thanainit Chotanaphuti**

Department of Orthopaedics, Phramongkutklaol College of medicine, Bangkok, Thailand

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Background

In early osteoarthritis (OA) knee without structural damage, synovial hypertrophy is a good biomarker to monitor disease progression and response to any treatments. NSAID has been proved to reduce inflammation or synovitis effectively. Transdermal microneedle is a non-invasive device to deliver medication by transdermal route. However, no recent study shows the effectiveness of transdermal NSAID via microneedle.

Objectives

To determine the effect of transdermal microneedle patch (TDM) with NSAID in synovial hypertrophy, knee pain and WOMAC score of osteoarthritic knee.

Study Design & Methods

Two-group, randomized, double-blinded, controlled trial was done. 100 participants, age 40-70 years, with painful knee OA and non-structural change on radiography will be randomly allocated to underwent either TDM (placebo) or TDM with NSAID (ketorolac 30 mg) at medial joint line of the knee once weekly for 2 times. Synovial thickness was measured by ultrasonography at pre-treatment, 1, 2, and 4 weeks. Pain score (VAS), WOMAC score and adverse events (AEs) were also recorded.

Results

One hundred patients were enrolled into 2 groups. Comparing to TDM with NSAID and Placebo group demonstrated significant reduction of synovial thickness and VAS at 2, 4 weeks ($P < 0.05$). Mean synovial thickness reduction were 1.12 and 0.27 mm. at 4 weeks And mean VAS reduction were 3.22 and 1.7 at 4 weeks (TDM with NSAID and placebo, respectively), but mean WOMAC score reduction statistically significant difference between groups at 4th weeks. Mean WOMAC score reductions were 5.71 and 0.96 at 4 weeks (TDM with NSAID and placebo, respectively). Treatment related adverse events in total 4 weeks, i.e. skin irritation, injection site pain, superficial skin infection were similar in all groups and no report of any complication

Conclusions

Transdermal microneedle patch with NSAID significantly decreased synovitis and improved pain score in OA knee after 2 weeks and improve WOMAC score over 4th week without any adverse events.