Review of the effectiveness of transdermal lidocaine for osteoarthritic pain

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Background

About 73% of people living with osteoarthritis are older than 55 years. Osteoarthritis can greatly reduce the quality of life.[1] While surgical interventions (including joint replacement) present one approach to advanced and disabling osteoarthritis, non-surgical interventions help people living with the condition to manage pain and maintain optimal levels of functioning. Pharmacological options should be used in combination with non-pharmacological measures at the lowest effective dose for the shortest period of time possible.

Lidocaine 5% plasters are used off license in clinical practice to treat chronic pain, and pain from osteoarthritis. The lidocaine contained in the medicated plaster diffuses continuously into the skin, providing a local analgesic effect. The low systemic exposure to lidocaine following use of the lidocaine patch 5% is particularly beneficial for patients with polypharmacy, or for patients who have low tolerance for systemic analgesics.

Methods

The aim of this review was to examine the current evidence for using transdermal lidocaine patch in managing pain from osteoarthritis.

A comprehensive literature search was performed using electronic databases to identify studies that assessed the effectiveness of transdermal lidocaine in osteoarthritis. Reference lists of included studies were also reviewed.

Results

6 studies were included in the review, with a total of 359 patients. **Table 1** details studies included.

3 studies used the Western Ontario and McMaster Universities (WOMAC) Osteoarthritis Index, and showed significant improvement from baseline with use of 5% lidocaine patch in WOMAC pain scores **(p<0.01)**, and 1 study showed significant improvement all 4 Neuropathic Pain Scale composite measures **(p<0.001)**.

3 studies were included in a meta-analysis. This showed a significant improvement across pain, stiffness and physical function on WOMAC Osteoarthritis Index **(Figure 1-3)**.

Author, Year	No. of patients	Indication	Duration	Reporting scale	Results	Adverse effects (AEs)
Gammaitoni et al 2004	100 patients (12 monotherapy, 88 add-on therapy)	OA in one or both knees and the presence of moderate-to-severe pain despite prn or stable doses of analgesic regimens	2 weeks	Mean change from baseline to Week 2 in each of the 4 Neuropathic Pain Scale composite measures	The lidocaine patch 5% significantly improved all 4 composite measures for both the monotherapy group ($p < 0.01$) and the add-on therapy group ($p < 0.001$)	No treatment-related AEs in monotherapy group. 5 patients in add-on group experienced treatment-related AEs, which were all graded as mild-moderate. 4 patients in the add-on group discontinued due to treatment-related AEs.
Galer et al 2004	20 patients	OA of one or both knees, symptoms and radiographical evidence	2 weeks	Western Ontario and McMaster Universities (WOMAC) OA Index scores, sub-items of the Brief Pain Inventory Short Form that include pain intensity and pain relief scores, BPI scores for pain interference with quality of life (QOL), and patient and investigator global assessment of pain relief and satisfaction	At week 2, statistically significant improvements were observed for all WOMAC subscale scores of pain, including the composite index ($p < 0.01$). More than 40% reduction was observed in all WOMAC subscale scores from baseline to week 2. All BPI measures of pain intensity, pain relief, and pain interference with QOL were significantly improved ($p < 0.05$). Global pain relief was assessed as moderate to-complete by 84% of patients and as moderate-to-a lot by 68% of investigators. The majority of patients (74%) and investigators (84%) were satisfied or very satisfied with lidocaine patch 5% monotherapy	Only 2 treatment-related AEs were reported (vertigo and hot flushes). No patients discontinued the study due to treatment-related AEs.
Castro E, Dent D 2017	87 participants (70 included in final analysis)	Knee or hip arthritis, or back pain for at least 3 months. Baseline pain score 3-8/10 on numeric rating scale	10 day follow up period	0-10 numeric rating scale for pain, side effects and quality of life	Analysing individual day 10 efficacy end points shows no statistically significant differences. Compared to lidocaine 5%; lidocaine 3.6%, menthol 1.25% met its primary end point by proving noninferiority on all efficacy, safety and quality-of-life measures at day 10. No analysis of lidocaine vs placebo.	Day 10 results show a strong but insignificant trend toward lidocaine 3.6%, menthol 1.25% with a 3.19 decrease compared with 1.32 (p-value = 0.098).
Baliki et al 2008	11 patients with chronic back pain and 8 patients with knee OA (8 and 5 had data analysed)	All the patients reported chronic pain for a duration longer than 3 months with a pain magnitude of at least 30/100 on a visual analog scale	2 weeks	The effects of an analgesic treatment on brain activity in chronic low back pain and in knee osteoarthritis were investigated using serial functional MRI for brain regions encoding pain intensity. OA patients completed visual analogue scale (0-100) and filled the WOMAC Osteoarthritis Index	OA patients did not show any decrease in pain after treatment as measured by VAS ($p = 0.5$), and a borderline decrease in pain in response to pressure stimulation ($p = 0.06$) OA patients did not show improvement after Lidocaine treatment in their knee pain as measured by VAS, or by intensity of pain on WOMAC .	No side effect reporting
Kivitz et al 2008	143 patients randomised, only 73 included in analysis	Diagnosis of unilateral or bilateral moderate-severe OA of the knee (including radiographic evidence of OA, with the presence of osteophytes)	12 weeks	Western Ontario and McMaster Universities (WOMAC) OA Index pain subscale.	Improvements in WOMAC pain subscale scores were found with the lidocaine patch 5% and celecoxib 200 mg/d; changes from baseline were not significantly different between the 2 groups. The rate of change from baseline (week 0) to week 2 in the WOMAC pain subscale score was significantly different from 0 with the lidocaine patch 5% (-1.5916 per week; P <0.001)	Side effects with the lidocaine patch 5% were headache, experienced in 13 patients (18.8%); and dyspepsia, pruritus, erythema, urinary tract infection, and anxiety, each reported in 2 patients (2.9%).
Burch et al 2014	137 participants	Osteoarthritis of one or both knees, who were using a stable analgesic regimen. Average daily pain intensity >4/10 as measured by the Brief Pain Inventory (BPI).	2 weeks	BPI scores were used to assess pain control. WOMAC Osteoarthritis Index, and patient/investigator global assessment of patch satisfaction. Quality of life was assessed by the seven domains of BPI Question 9.	Average pain intensity scores were 29% lower after 2 weeks of lidocaine patch 5% treatment compared to baseline (P<0.001); similar improvements were recorded for worst pain, least pain, average pain, and pain relief. Significant improvements were also observed for all WOMAC subscale scores and the WOMAC composite index (P<0.001) At Week 2, significant improvements were observed for all BPI measures of pain interference with QOL due to osteoarthritis. The BPI composite score for QOL impairment decreased from 37.2±13.7 at baseline to 23.5±15.1 at Week 2 (P<0.001)	Fourteen (10%) patients experienced treatment-related AEs. Mild-to-moderate treatment-related AEs reported by more than one patient included headache (4), dermatitis (3), and taste disturbance (2). Five (3.6%) patients discontinued due to treatment-related AEs.

Table 1

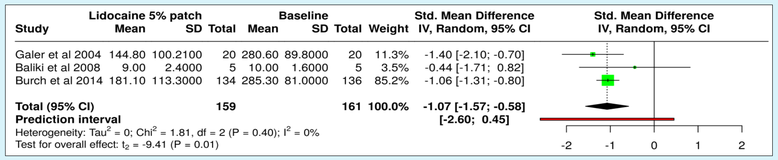

Figure 1: pain

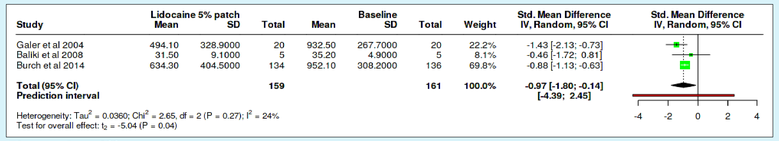

Figure 2: stiffness

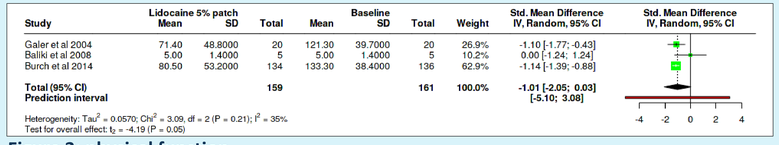

Figure 3: physical function

Conclusion

Despite the small sample sizes, these findings suggest that lidocaine 5% plasters may be a beneficial option for managing OA pain, particularly in older people with co-morbidities and polypharmacy. However, there is strong evidence to support topical NSAIDs in OA[8], and these should be used first line. Further studies are recommended to confirm these findings and better understand the role of lidocaine patches in OA management.

References

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