

A randomised clinical investigation into placing pain spot externally to crossing area of the two currents of interferential therapy on pain



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Introduction

Interferential therapy (IFT) has been applied in a quadripolar way so that the two currents intersect in the painful area. Clinically, no clear reduction effect of pain has been confirmed with this application method of IFT¹⁻³. Experimentally, the highest voltage of IFT is being induced outside the intersection area of the two used currents⁴. Thus, it is probably true that placing the painful area outside the intersection spot of the two currents would reveal a significant pain reduction.

Purpose

To investigate effect of IFT in pain while placing the painful spot outside the crossing point of the two currents compared to the traditional application.

Participants

One hundred sixty-two (81 males and 81 females) volunteer subjects with low back pain who met the inclusion criteria participated in this study.

Methods

Participants were randomly assigned to: 1- external IFT (painful spot was at 2 cm outside of the outer borders of the electrodes) 2- placebo external IFT 3- traditional IFT (painful spot was at the crossing area of the two currents) 4- placebo traditional IFT (Fig 1). Groups 1 and 3 received 20 min of IFT at 100 Hz and comfortable stimulation intensity. Groups 2 and 4 received placebo IFT for 20 min.

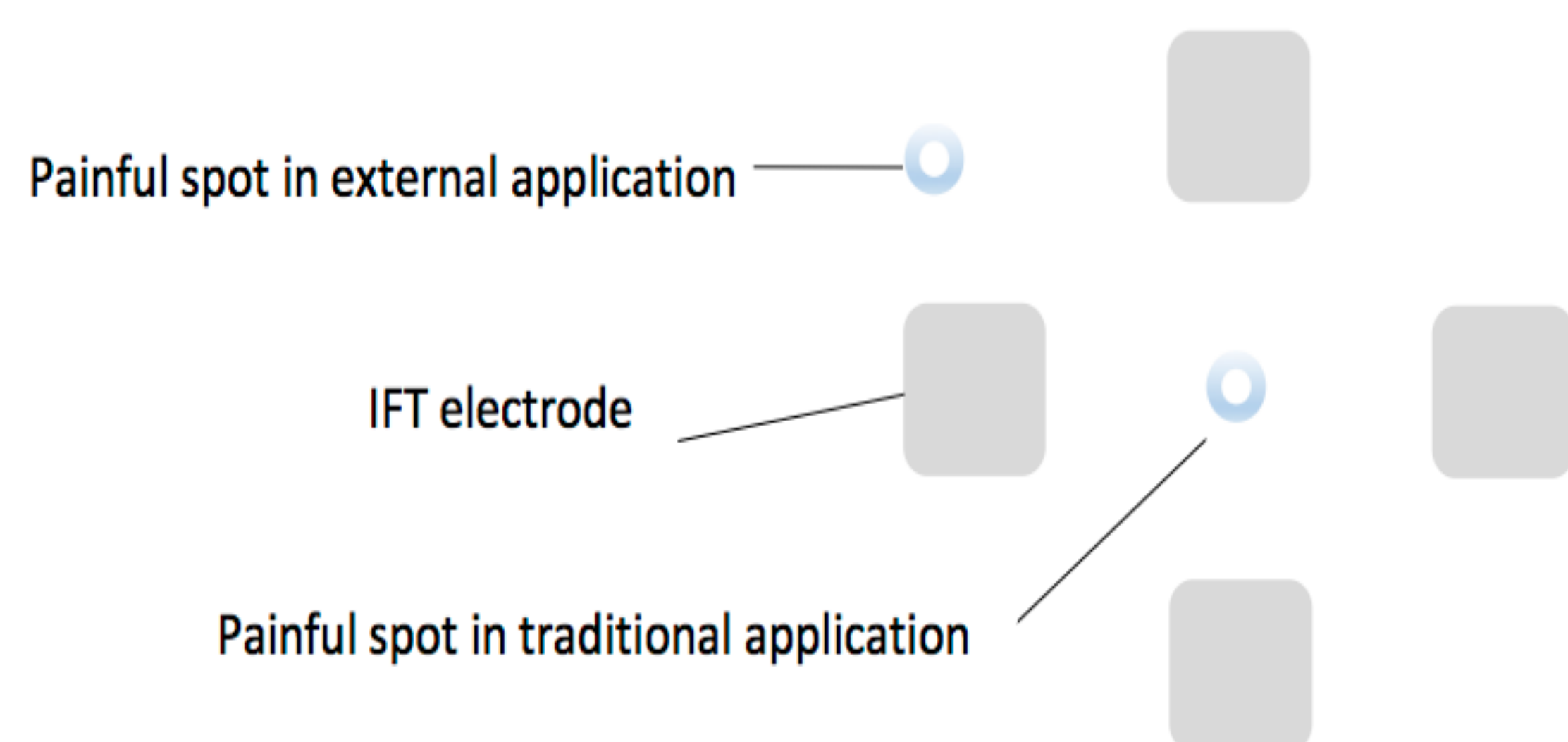


Figure 1: IFT electrode placement in relation to the painful spot. The application was guided by the painful spot as per treatment group while the electrodes positions were fixed.

Assessment

Before and immediately after IFT session, pain severity, pressure pain threshold (PPT), pain distribution and trunk flexion range of motion (ROM) were assessed as follows:

Pain severity : Visual analogue scale (VAS); 0 to 10

PPT: Algometer

Pain distribution: From pain source → as far as it goes

ROM: From tip of middle finger to ground

Results

VAS and ROM improved with all groups, $P < 0.001$ and $P = 0.04$ respectively. No statistical differences appeared between groups, for VAS $P = 0.15 - 0.95$ and for ROM $P = 0.10 - 0.83$ (Table 1). True IFTs improved VAS and ROM to same extent. There was a trend of better VAS reduction with true IFTs compared to placebos (Fig 2).

Oppositely, PPT and pain distribution did not significantly change with any of the groups, $P = 0.11$ and $P = 0.48$ respectively. Significant statistical difference between groups was in favour of placebo groups; for PPT ($P = 0.01$) and for pain distribution ($P = 0.04$) (Table 1). True IFTs changed PPT and pain distribution closely.

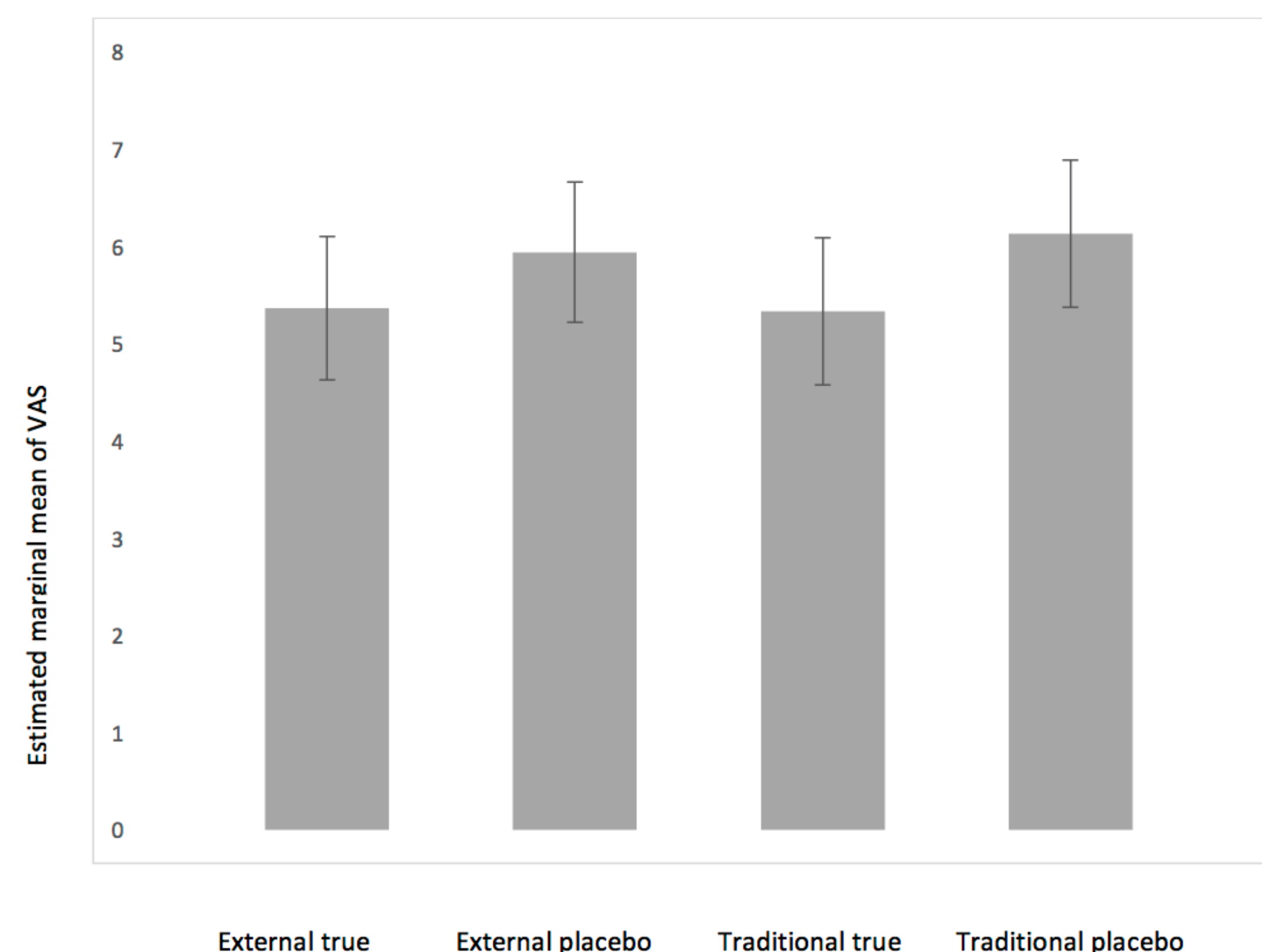


Figure 2: Trend of better reduction of pain severity (VAS) with true IFT applications compared to placebos, X-axis represents the IFT groups and Y-axis represents the mean with error bars at 95% CI of change in VAS.

IFT group	External true	External placebo	Traditional true
External placebo	(A) 0.28 (B) 0.09 (C) 0.08 (D) 0.37		
Traditional true	(A) 0.95 (B) 0.83 (C) 0.62 (D) 0.95	(A) 0.26 (B) 0.15 (C) 0.22 (D) 0.35	
Traditional placebo	(A) 0.16 (B) 0.31 (C) 0.71 (D) 0.87	(A) 0.72 (B) 0.01 (C) 0.04 (D) 0.46	(A) 0.15 (B) 0.22 (C) 0.40 (D) 0.82

Table 1: Pairwise comparison of significance (P-value) between groups; (A) for VAS, (B) for PPT, (C) for pain distribution and (D) for ROM.

Discussion & Conclusions

This study failed to show neither real pain reduction effect of IFT nor difference between traditional and external applications. None of the pain outcome measures assessed here, nor the ROM, were affected by IFT. That is because, both true and placebo applications reduced pain and improved the ROM to same extent. However, there was a trend of superiority of true applications to both placebos for reducing pain severity

Recommendations

Further studies with multiple session of treatments with IFT while assuring same design done here are needed to confirm the results obtained in this work. Second, a longer treatment time is needed to be examined which may result in a different conclusion. Third, other AMFs than 100Hz are required to be examined which could produce better effects of IFT. Finally, further studies with larger sample sizes are required to clarify the trend of better effect of true IFTs appeared here.

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