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Local Infiltration Anaesthesia (LIA) and novel technique for effective pain relief following elective primary hip and knee replacement-innovative study

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Background: Acute pain control following elective primary total knee replacements (TKRs) and total hip replacements (THRs) is often poor and is associated with long term chronic pain syndrome. Moderate to severe pain is often reported in the first 48 hours following surgery requiring different pain modality management strategies such as patient controlled analgesia and multimodal drug analgesia. The Local Infiltration Anaesthetic (LIA) technique is currently an established technique to tackle perioperative pain relief; however, studies have reported conflicting evidence so far. In a recent review of 29 studies investigating the use of LIA in TKR, LIA emerged as a safe technique with improved pain control (Gibbs DMR 2012). We have developed the LIA technique to include an intra-articular catheter allowing an infusion of Novel Mixture (NM) to be infused continuously postoperatively.

Aims and Objectives: In this study we report on our experience using LIA in addition to the Novel Technique and Proprietary NM developed in Leeds-Bradford and infiltrated at 4-5 mls/hour for 48 hours post surgery.

Materials and Methods: Between October 2013 and October 2015, 62 patients undergoing primary TKR were prospectively followed up. Three groups of patients were studied. All patients studied had spinal anaesthesia (SA) with 300-400mcg diamorphine.

Group1. GA. No LIA and no NM. 20 patients.

Group 2. SA plus NM for 48 hours post operatively with catheter placed anteriorly under the patella. 21 patients.

Group 3. SA plus LIA plus NM for 48 hours post operatively with catheter placed posteriorly in the knee joint. 21 patients.

Between June 2011 and July 2014, 173 consecutive patients undergoing primary THR using the posterior approach were also prospectively followed up.

Group 1. GA only. 31 patients, Group 2. SA only. 37 patients, Group 3. SA plus LIA1 only. 38 patients, Group 4. SA plus LIA2 only. 34 patients, Group 5. SA plus NM for 48 hours. 33 patients.

Demographics reveal similar distribution between the two groups in terms of age and sex.

Results and complications: The patients without LIA or NM required more morphine in the first 12 hours postoperative period than the other groups. Seventy percent (n=14) of these group 1 patients required 10mg morphine following TKR compared to only 2% (n=1) of patients requiring 10mg of morphine when LIA and NM were used. The increased morphine requirement continued for 48 hours postoperatively in group 1, whereas none of the patients in groups 2 or 3 required morphine after 36 hours. Statistical analysis revealed no difference of morphine requirements with different catheter placement. Fewer patients suffered from nausea and vomiting or urinary retention in the group with LIA and NM (p-value <0.05, Mann-Whitney test). There were no infections DVT or other complications in any of the groups.

Conclusion: This study demonstrates that patients following TKR treated with LIA and NM for 48 hours after required significantly less morphine during this time. This benefit was most marked in the first 24 hours after surgery and the benefit was maintained for 48hours. Fewer patients required opiate analgesia when LIA plus NM was used compared to the other groups. The highest significance was at 0-12 hrs for patients requiring up to 20mg morphine usage ($\chi^2(2) = 46.713$, $p = 0.000$); and 0-12hrs for patients requiring 30mg morphine usage ($\chi^2(2) = 46.310$, $p = 0.000$).

Biography

Mohammad Salhab is an Academic Clinical Fellow in Orthopaedics at the unit with a PhD studentship in pharmaceuticals and currently involved in developing the NM. Mr Salhab has published many articles in surgical field and also bioethics and basic science.

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