

Early Outpatient Pain scores in Hip and Knee Arthroplasty. Could these be early predictors of painful joint replacements?

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Abstract

Total Hip (THR) and knee replacements (TKR) are now very common procedures performed in Orthopaedics with 150,000 performed per year in the UK according to the National Joint Registry. We know that some joints remain permanently painful even after replacements. It is well known that up to 20% of total knee replacements and 10% of total hip replacements remain painful even beyond 1 year post-implantation, the reasons for this are unclear.

Little is known about the mid-term pain levels after discharge from hospital to the community, nor whether this is predictive of ongoing pain later. The aim of this study was to tabulate the pain scores daily for the 1st 6 weeks post-surgery using Visual Analogue Score (VAS) three times a day. Functional outcomes were assessed using Oxford Knee Score (OKS) or Oxford Hip Score (OHS). This will provide a baseline in the literature for this period from which further studies can build.

A total of 80 patients undergoing THR or TKR were studied at Milton Keynes University Hospital. There were 40 hips and 40 knees. A total of 48 females and 32 males were studied. In THR group there were 21

females and 19 males, and the mean age was 67.27 years. In the TKR group there were 27 female and 13 male and mean age was 68.08 years. At the end of 6 weeks; the mean Oxford Hip Score was 31.33 while mean Oxford Knee Score 31.37. The Visual Analogue pain Score (VAS) was high in the first two weeks but at 6 weeks dropped down to slightly above 1. Our study demonstrates a linear reduction in pain scores on the VAS scale over the six week period for both hips and knees. Our study also shows diurnal variation of post-operative pain in both THA and TKA groups (with pain highest in the mornings and evenings and lowest at midday). Further studies taking cohorts out to 1 year and comparing early to late pain scores (1 year plus) are needed to see if those going on to have long term pain can be predicted early, and potentially alter their management positively.

As lengths of stay approach 1 day internationally, joint replacement is now considered suitable for ambulatory care. It becomes even more important to have a handle on pain levels once discharged into the community.

Keywords: Pain, Study, Total Hip Replacement/arthroplasty, Total Knee replacement/arthroplasty.

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Introduction

Today, over 80,000 Total Hip Replacements are performed in England and Wales every year [1], and approximately 70,000 total knee replacements are performed per annum in England [2]. Much is known about the eventual long-term outcomes, and the period of inpatient hospitalisation but little is known about the period between discharge from hospital and time of first review in outpatients (usually 6 weeks) with regard to the patient experience, analgesia use and pain levels. However, it is known that some 20–25% of total knee replacements remain painful even after 1 year post implantation, the reasons for this are unclear, but this is a consistent problem internationally. There is less of a long term pain problem with hip replacements than with knees. Again the reason for this scientifically speaking is not clear.

The gap in our knowledge is exactly what goes on in the six weeks following surgery between being discharged from hospital and seeing the consultant again in the outpatient department, and whether factors during this early recovery influence long term outcome. Knee replacements remain sore for a number of weeks post-surgery, and patients are prescribed analgesia to take as required, and have appointments with a physiotherapist to help with ongoing rehabilitation.

The aim of this study was to tabulate the pain scores daily for the 1st six weeks post surgery, and to have once per week Patient Reported Outcome Measures (PROMS) in the form of OHS (Oxford Hip Score) or OKS (Oxford Knee Score). In this sense, this is an

observational study. The secondary aim is to follow these patients up at 6 months and 1 year in the research physiotherapy PROMS clinics and to investigate if those who are struggling at 1 year would have been predictable based on their early pain scores or analgesia use or OHS and OKS in the 1st 6 weeks.

Methods

This is an observational study carried out in Trauma and Orthopaedics department of Milton Keynes University Hospital, United Kingdom. A total of 80 patients were studied, 40 underwent Total Hip Replacement and 40 who underwent total Knee Replacement between 2014 and 2016. The aim of this study is to tabulate the pain scores daily for the 1st 6 weeks post-surgery, and to have once per week Patient Reported Outcome Measures (PROMS) in the form of OHS or OKS.

Inclusion Criteria:

- 1) Patients undergoing Primary Total Hip and Total knee replacement.
- 2) Patients who are prepared to fill the proforma questionnaires post discharge.

Exclusion Criteria:

- 1) Patients undergoing revision hip or knee replacements.
- 2) Patients also having other body pains like, back pain or hip pain (as these influence the OHS or OKS).
- 3) Patients who are confused or having mental health issues.

Patients were made aware of the study before the surgery and verbal consent taken. Patients were provided with an Information Booklet clearly mentioning the objectives of the study.

The booklets contain a grid for Visual Analogue Scores (3 times / day), Oxford Knee / Hip score proforma and column for documenting daily analgesia use. They were provided with a self-addressed stamped envelope for returning the booklet or they handed back to the operating surgeon in clinic at their six week follow-up.

Results

80 patients were studied (40 hips, 40 knees). There were 48 females and 32 males. In the total hip replacement group there were 21 females and 19 males, mean age was 67.27. In the total knee replacement group there were 27 females and 13 males, mean age was 68.08 years. Mean overall Oxford Hip Score was 31.33 while mean Oxford Knee Score 31.37 for both hip and knee groups combined. The graphs below (Figures 1 to 4) show the VAS for the various subgroups analysed.

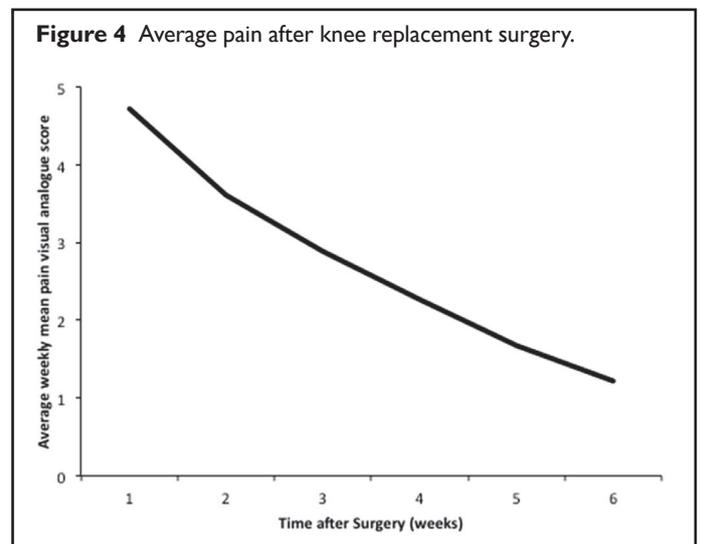
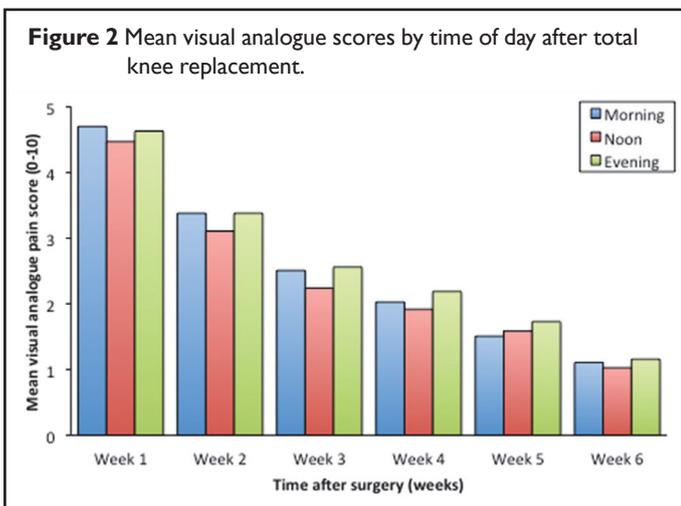
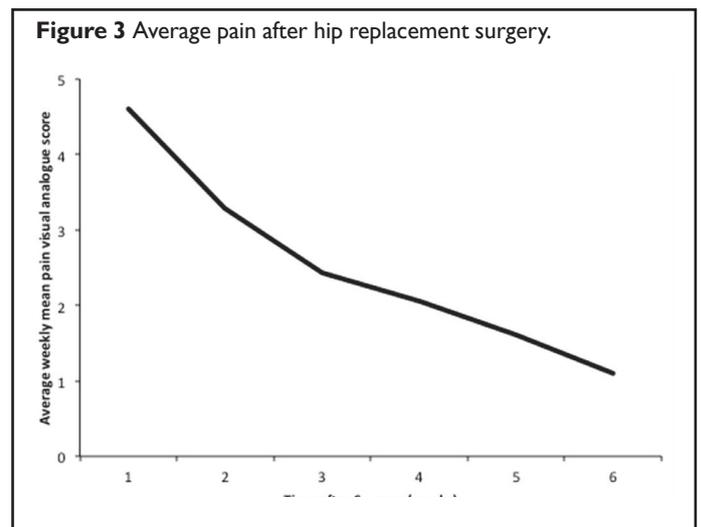
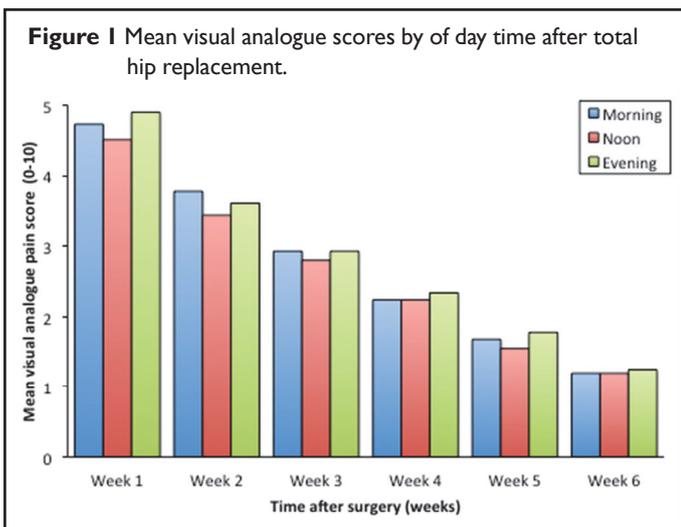
Discussion

The pain levels of patients post discharge from hospital after hip or knee arthroplasty have not been studied in the literature. Nor whether the outliers (with high pain scores) during this period go on to be those same patients beyond 1 year who have ongoing problems of a painful arthroplasty.

In our study we found that in the 1st postoperative week the combined mean VAS is 4.7/10, higher for the knees than for the hips. The VAS falls in a linear fashion continually from 1st to 6th week where it is approximately 1/10. There are some patients in the TKR and THR group in which pain remained as high as 4 in the end of six weeks. These outliers are the patients, in particular, that need to be followed up at six months and one years time, to see if they remain painful then, and hence could have been predicted at this earlier stage. If this does turn out to be the case; whether an early intervention in these patients could treat their pain early, and as a result, in the long term. For example with increased analgesia or increased rehab with physio or group therapy.

We also found a diurnal variation of post-operative pain in both THR and TKR groups (higher in the mornings and evenings, with a low point around midday). This has not been reported before. Post-operative pain in THA group is greater in the evening in the first week followed by morning in the second week. In 3rd, 4th and 6th week; morning pain is greater while in the 5th week evening pain is greater. The cause of this diurnal variation is not known. This information can be useful for the purposes of the timings of post discharge analgesia, ie stronger analgesics or higher doses for the morning and evening doses.

Our study is relatively small, only 80 patients were studied but even among these; there 4 patients (8%) who remained painful with VAS of 4 or above at 6 weeks post surgery. 3 were from the TKR group and 1 from THR group who had VAS of 4 or above (moderate pain). It is possible that they will remain painful throughout. But equally



possible, that their pain will settle down with time. This remains to be seen.

The reported estimates of the prevalence of post-operative pain after joint replacement vary, but are in the region of 7% to 20% of TKR patients³⁻⁶ and 2% to 8% of THR patients^[7,8]. Therefore, although joint replacement is successful at providing pain relief for many patients, there is a proportion of patients who experience a poor outcome after surgery. And this cohort is the subject of many investigations, this one included.

In the literature there are some studies that show that a significant proportion of joint replacements remain painful in the early post-operative period. Chan and colleagues showed this in total knee replacements. In their study more than half of the participants had significant pain during the first 2 weeks at home. The majority of them had frequent pain, occurring during day with daily activities and interfering with their sleep despite almost 70% of the participants taking at least one opioid [9]. Bradley et al showed that cultural differences and ethnicity might have influenced pain responses, pain reporting and coping preferences between the Australian and Singapore cohorts [10].

Liu and colleagues^[11] published a multi-centre cross-sectional study in 2012 to identify preoperative risk factors for moderate to severe pain after total hip and knee replacements. They found that Moderate to severe pain was reported by 20% at rest and 33% with activity. Predictors for pain at rest were female gender, younger age, increased BMI, TKR vs. THR, increased severity of preoperative pain at the surgical site, preoperative use of opioids, and general anaesthesia, preoperative use of anticonvulsants, and anti-depressants, and prior surgery at the surgical site.

Finally persistent pain in a hip or knee replacements is not uncommon. Patients need to be informed of this prior to committing to their surgery. This aids informed consent. And may promote greater engagement with pre-operative optimisation and post-operative rehabilitation programmes.

With Rapid Recovery Programmes and Enhanced Recovery Programmes (also termed Fast Track Surgery), length of stay times are approaching 1 day. This is bringing joint replacement surgery in to the ambulatory care setting. It is clearly increasingly important to elucidate patient pain scores on discharge after these painful procedures.

In summary, in our study we found that the prevalence of persistent pain after TKR and THR is about 8% at 6 weeks after surgery. It is more in the TKR group as compared to THR group. There is also diurnal variation of post-operative pain in both THR and TKR groups.

Conclusion

The strengths of our study is that we used standard, validated and simple scoring systems to evaluate the postoperative pain, with this being the first report with detailed pain scores for this 6 week post-operative period. This study shows that some patients that have high pain scores (outliers), these are potentially the most interesting patients that need to be followed up at the one year mark. The whole cohort needs close attention out to 1 year, as if our figures for painful arthroplasty normalise to those in the literature, then our 6% will rise to 20%, and those 14% difference must therefore not have been outliers in the 1st 6 weeks. This remains to be seen.

An obvious weakness is the small sample size. Greater numbers would be necessary in future studies for statistical significance. The long term aim of this data is to look for early predictors of patients who will go on to suffer long term pain, with a view to be able to intervene early to prevent this.

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