Poster #651

Healthcare Resource Utilization Associated with Preoperative Meloxicam IV in Primary Total Knee Arthroplasty

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INTRODUCTION

Intravenous (IV) meloxicam (meloxicam IV, ANJESO™) is a novel formulation of Nano Crystal Colloidal Dispersion meloxicam, approved for use in adults for the management of moderate-to-severe pain, alone or in combination with non-NSAID analgesics. Nine Phase 2 and 3 clinical studies have been completed in subjects with postoperative pain. Previous studies assessed postoperative pain reduction after meloxicam IV administration. The clinical study assessed preoperative administration of meloxicam IV to replicate current clinical practice conditions in total knee arthroplasty (TKA) procedures, including the use of standardized clinical care and multimodal analgesia protocols.[1] The primary clinical study objective was to assess the effect of preoperative administration of meloxicam IV on opioid consumption in subjects undergoing TKA compared to placebo. Secondary objectives of the clinical study included safety and tolerability of preoperative administration, effects on postoperative pain, and healthcare resource utilization (HRU) compared to placebo. The primary objective the of economic sub-study was to evaluate HRU and costs. This poster presents the results of an economic sub-study analyzing HRU and costs collected during the clinical study.

OBJECTIVES

Primary Objective: To evaluate HRU and costs (total hospital costs; hospital length of stay, LOS; hospital readmissions; emergency room visits, ER; physician office visits; and phone calls due to pain), associated with preoperative administration of meloxicam IV vs. placebo.

METHODS

Subjects

This study was conducted under an FDA IND, IRB approval was obtained prior to study conduct, and all subjects provided written informed consent.

Selected inclusion criteria:

- Males and females aged 35 to 80 years.
- Planning to undergo an elective, primary (no repeat arthroplasties) open unilateral TKA, and expected to require IV analgesia in an inpatient setting for ≥24 hours.

Selected exclusion criteria:

- Active or recent gastrointestinal (GI) bleeding or peptic ulcer disease.
- Known bleeding disorder or taking agents affecting coagulation.
- Moderate to severe renal or hepatic dysfunction.

Study Design

- Multi-center, randomized, double-blind, placebo-controlled study, 1:1 randomization
- Screening visit, a surgery and inpatient evaluation visit, and 2 follow-up visits (at 10-14 and 30 days)
- First dose was administered after spinal anesthesia and prior to the start of surgery; every 24h thereafter
- Subjects received pre-, peri-, and post-operative clinical care per standardized protocol
- Subjects were able to utilize opioids, but no additional NSAIDS, postoperatively as required.
- Subject-level database developed based on data captured in the UB-04 claim form
- A national cost:charge ratio applied to convert “charges” to “costs.” [2]
- Hospital costs, LOS reported descriptively (mean, median, SD), Wilcoxon rank-sum tests between grps.
- Impact of treatment group, opioid consumption (time study drug administered, to discharge) and opioid related adverse drug effects (ORADEs), on hospital LOS (days) and hospital costs were analyzed via separate generalized linear models (GLMs), with log link and gamma distribution.
- Hospital readmissions, ER and physician office visits, and phone calls due to pain were summarized.

RESULTS

Demographics

- 181 subjects were enrolled in the trial, (93 meloxicam IV 30 mg and 88 placebo).
- The groups were comparable in terms of demographic characteristics (60% aged ≥ 65 years, 42% males, and nearly 80% white in both treatment groups).
- Most subjects had private insurance (54.8% and 52.3%, respectively). Four subjects had ‘other’ insurance which included CHAMPVA, Medicaid, Medicare/United Health and Medicare/Medicaid (1 patient each). **Table**

Measures of Interest	Meloxicam IV		Placebo		p-value
	N	%	N	%	
All Enrolled Subjects	93	51.4%	88	48.6%	
Mean Age (SD)	66.9 (8.23)		65.5 (8.11)		0.2370
Age ≥ 65 years	58	62.4%	54	61.4%	0.8897
Sex					0.9880
Male	39	41.9%	37	42.0%	
Race					0.9992
White	74		70	79.5%	
Black/African American	18		17	19.3%	
Asian	1		1	1.1%	
Mean BMI kg/m² (SD)	30.6 (4.74)		31.5 (5.05)		0.1991
Insurance type					0.7294
Private	51	54.8%	46	52.3%	
Medicare/Other	42	45.2%	42	47.7%	
Quadriceps tendon spared (Y)	67	72.0%	58	65.9%	0.3722

Efficacy

Total Hospital Costs

- Total mean costs of hospital stay were numerically lower in the meloxicam IV group vs. the placebo group; however, the difference was not statistically significant ($29,302 vs. $31,821; P=0.7037).
- The GLM showed that after adjusting for age, sex, ethnicity, and whether quadriceps tendon was spared during the surgery (yes/no), subjects administered meloxicam IV incurred $2,266 less total costs compared to subjects in the placebo group, although this difference was not statistically significant (exp[β]=0.902, P=0.1689).

Hospital LOS

- Mean hospital LOS in days was numerically lower in meloxicam IV compared to the placebo (2.05 vs 2.24 days; P=0.3887).
- The GLM showed that meloxicam IV was associated with 8.6% lower LOS in days as compared to placebo; however, those differences were not statistically significant.

Total Opioid Use

- Mean total opioid use from hour 0-24, 0-48, and 0-72 hours was significantly lower among meloxicam IV compared to placebo (P<0.0001) and from hour 0 through hospital discharge (33.28 vs 44.87 mg, P<0.001).
- Time to first oral opioid rescue medication was longer for meloxicam IV than placebo (7.31 vs 5.22 hours; P=0.0226) and a similar trend was observed for mean time to first use of IV or oral opioid analgesia (4.75 vs 3.09 hours; P=0.0126).
- While there was no significant association between opioid consumption and total hospital costs, every unit (1 mg IV morphine equivalent) increase in opioid consumption was associated with a 0.5% increase in LOS in days (P=0.0001).

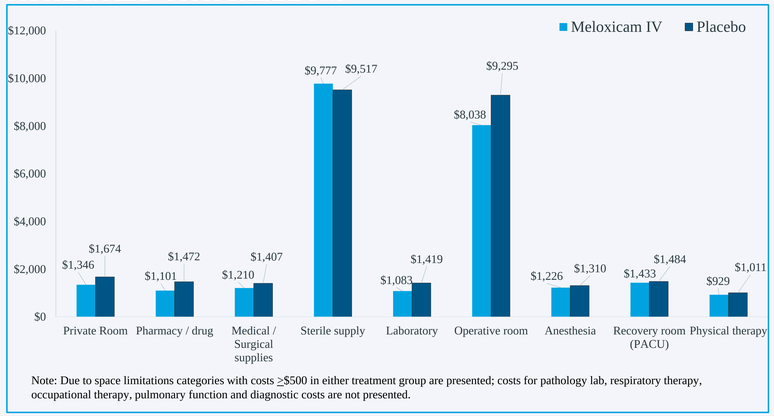
ORADEs

- Proportion of subjects with ≥1 ORADEs were significantly higher for placebo than meloxicam IV (70.5% vs 48.4%; P=0.003). Six meloxicam IV subjects (6.5%) had ≥1 AE of special interest in comparison to 12 placebo subjects (13.6%). Serious AEs were observed among 3 meloxicam IV subjects (3.2%) and 9 placebo subjects (10.2%).
- There was no significant association between presence of ORADEs and total costs of hospital stay. However, subjects with ≥1 ORADEs had 15.1% higher LOS in days and 13% higher LOS in hours as compared to those with no ORADEs (P=0.018).

Post Discharge HRU

- There were numerically fewer hospital readmissions (1 vs. 3), ER visits (0 vs. 4), and phone calls due to pain (4 vs. 9) for meloxicam IV versus placebo, respectively. There were no reports of unscheduled physician office visits due to pain in either group.

FIGURE 1: MEAN COSTS BREAKDOWN



Note: Due to space limitations categories with costs ≥$500 in either treatment group are presented; costs for pathology lab, respiratory therapy, occupational therapy, pulmonary function and diagnostic costs are not presented.

CONCLUSIONS

- In this study, there was evidence of lower short-term HRU for subjects undergoing TKA who received preoperative meloxicam IV 30mg compared to placebo added to a standardized ERAS protocol.
- Future research is needed to study the impact of meloxicam IV on long-term HRU.

REFERENCES

1. 025 Study https://clinicaltrials.gov/ct2/show/NCT03434275
2. Healthcare Cost and Utilization Project (HCUP). Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/db/state/costtocharge.jsp. Accessed November 4, 2019.