Retrospective study to identify factors in fast, medium and slow progressing osteoarthritis patient in Germany

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Introduction

- Osteoarthritis (OA) is a common disorder whose treatment focuses mainly on pain management and surgery in the final stages of the disease. Research demonstrates that some patients have faster disease progression and earlier surgery. The objective of this study is to identify patient characteristics implying faster disease progression to support optimal disease management.

Method

- Data were extracted from German Disease Analyzer (DA) electronic medical records for a 12 years period (2004-2016). There were ~50k eligible patients with confirmed OA diagnosis (defined by ICD10 codes M15, M16, M17, M18 and M19).

- Descriptive statistics and clustering methods were applied (K-means). The analyses include a 12 year period (2004-2016) of electronic medical records. Patients were divided into groups based on the time of surgery from diagnosis (previous surgery, 0-2 years, 2-5 years, over 5 years and no surgery). The underlying data included different variables such as diagnosis and treatment (drug) patterns, laboratory tests and demographic information for osteoarthritis patients.

Results

- The demographics in table 1 show a similar distribution on the gender by cohort (mostly female) but there are differences in age, obesity and comorbidity status.

- OA treatments were grouped into broader categories. Figure 2 represents the mean number of prescriptions (RX) for each treatment category from the time of diagnosis. The mean number of treatments tends to increase in the groups that have later surgery.

- In figure 3 the OA patient journey illustrates that the treatment initiation of opioids starts significantly earlier in the faster progressor groups (surgery within 2 years and within 2-5 years). Interestingly the fastest progressor group have surgery prior to opioid initiation therapy. This might imply an unmet need (unresolved pain after surgery) or further joins affected.

- Laboratory tests were collected in all groups. T-tests show the results that were significantly different than the average for each group (figure 4).

- Our data show that the top differentiators for early surgery are: high weight, high triglycerides and high gamma GT values, older age (>67) and earlier initiation of opioids treatment (see figure 5).

Conclusion

The evidence suggests that some patients’ attributes might predict faster progressing disease. This should be explored further with machine learning approaches. There is evidence of a high unmet need in the faster progressing population: opioid administration after surgery might imply unresolved pain (10-30% of the patients do not improve after surgery) [3]. Malfunctioning joint replacement could also be an explanation.


3. Desmeuleas et al., 2013.