



## RACP Foundation Research Awards

### FINAL REPORT

<b>Project / Program Title</b>	Targeting pain in end stage osteoarthritis	
<b>Name</b>	Prof Anita Wluka	
<b>Award Received</b>	2020 RACP Fellows Career Development Fellowship	
<b>Report Date</b>	10/06/2021	
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#### PROJECT SUMMARY

Osteoarthritis is a common form of arthritis. It is multifactorial, being due to a variety of insults to the joint. Despite this, prevention and management is delivered using a “one size fits all” approach. Pain, the main problem patients experience, may be due to many different causes. Pain is treated the same way in all with osteoarthritis, regardless of the cause of pain. This may explain why pain management is often ineffective, leaving over 50% of patients dissatisfied with their pain control. It is possible that treatments targeted at the different causes of disease and pain may be more effective.

Abnormal changes in the brain and spinal cord in people with osteoarthritis can contribute to neuropathic-like pain. People with neuropathic-like pain feel pain from stimuli that would not usually cause pain. We found that 20-40% of people with knee osteoarthritis and 9-29% of those with hip osteoarthritis had this form of pain, regardless of the severity of disease.

Similarly, about 30% of people with non-specific low back pain also have this sort of pain. When these people were treated with an antidepressant, amitriptyline, they were more likely to have an improvement in pain than those treated with a placebo.

Based on previous work that suggested high blood cholesterol may increase the risk of osteoarthritis a trial was performed to examine whether treatment with cholesterol lowering agents reduce this risk. Although it did not reduce disease progression overall, in a select group, it reduced cartilage loss.

Better understanding the different factors that lead to osteoarthritis and contribute to pain may enable more targeted effective treatment of this condition.

#### PROJECT AIMS / OBJECTIVES

The broad aim was to examine whether phenotyping in osteoarthritis could be used to improve outcomes. Although a vanguard trial was planned, due to the COVID pandemic it was not possible due to the cancellation of elective surgery in 2020 in Victorian public hospitals.

Thus a systematic review was performed to determine the prevalence of neuropathic-like pain in patients with osteoarthritis, and whether it was affected by the joint involved or the severity of disease.

Pilot data were obtained by surveying the prevalence of neuropathic-like pain in patients awaiting joint replacement in a Melbourne teaching hospital, and also in those being assessed for a clinical trial to treat pain in knee osteoarthritis.

To demonstrate the possibility of improved outcomes by phenotyping, a post hoc analysis of a clinical trial of amitriptyline in low back pain was performed. Those with neuropathic pain showed improved pain whereas those without neuropathic pain experienced no benefit from treatment.

This program of work has been used to support submitted applications for the proposed clinical trial.

Osteoarthritis is known to be multifactorial. Previous data suggested that hyperlipidaemia and its treatment may affect the risk of osteoarthritis. A clinical trial was performed to examine whether the use of atorvastatin reduced the progression of the structural changes in knee osteoarthritis.

The impact of osteoarthritis, a systematic scoping review was performed to demonstrate the similarities in patients' needs in the 2 conditions.

### **SIGNIFICANCE AND OUTCOMES**

Musculoskeletal conditions are the top cause of years lived with disability internationally. Despite this, their treatment is largely ineffective. The economic and health costs are significant. One of the reasons for this may be that although the conditions and causes for pain within them are multifactorial, treatment is applied in a "one size fits all" fashion. Currently less than half the patients with osteoarthritis experience adequate pain relief. Improved pain management for these patients is urgently needed.

This work demonstrates that neuropathic-like pain can be easily identified using self-administered questionnaires in 20-40% of patients with knee osteoarthritis. Results of the systematic review and 2 local prevalence studies were consistent.

Targeting patients with neuropathic pain in low back pain with amitriptyline, specific treatment for pain with this underlying mechanism, improved pain.

The use of atorvastatin did not reduce the progression of the structural changes of osteoarthritis over 2 years in patients with mild to moderately severe osteoarthritis. However, based on subgroup analysis, it may be that the widespread use of statins in the management of cardiovascular disease has some benefit on reducing the progression of knee OA.

These data suggest that phenotyping patients and applying targeted therapy can improve outcomes for patients with osteoarthritis and musculoskeletal pain. The methods used would be easily translatable to practice. This approach and these results suggest phenotyping may provide a pathway towards better understanding of the factors leading to osteoarthritis and contributing to pain. Targeting specific patient phenotypes may improve healthcare outcomes.

### **PUBLICATIONS / PRESENTATIONS**

The systematic review of the prevalence of neuropathic-like pain provided the opportunity for a RACP basic trainee to learn skills in systematic review, osteoarthritis and presentation experience. The work attracted significant national and international attention, with invited podium presentations at OARSI World Congress, the peak International body for research in Osteoarthritis and the Australian Rheumatology Association Annual Scientific Meeting. This was chosen to be presented in the finals at the RACP Congress trainee poster competition.

## ACKNOWLEDGEMENTS

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