



Knee Osteoarthritis: Use of investigations and non-operative management in the Australian primary care setting.

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BRIEF REPORT

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Abstract

Background

Osteoarthritis affects 15% of Australians or around 3.2 million people. This figure will rise owing to the ageing of the Australian population. Over 38000 knee arthroplasties are performed each year in Australia. There are limited resources for arthroplasty and ever increasing numbers of patients with osteoarthritis of the knee that will ultimately require one. It is therefore important to promptly diagnose the condition and utilise simple, efficacious management options to alleviate suffering for patients and the overburdened health system. Evaluation of current investigations and management in comparison with published guidelines is the first step.

Method

Ninety-five patients with 100 symptomatic knees referred from their GP with a provisional diagnosis of osteoarthritis, were surveyed on the investigations and management they had received prior to presentation. The results were then compared with accepted clinical guidelines.

Results

There is a disparity between the clinical guidelines and the results of the survey from clinical practice. 27.5% of patients had not undertaken the gold standard weight bearing radiograph prior to presentation. 6% of patients did not have

a plain radiograph at all. Simple efficacious treatments with high levels of evidence such as physiotherapy and weight loss had only been utilised in 41% and 58% respectively. 55% had used glucosamine which is not recommended in the guidelines.

Conclusion

A better awareness of the rationale for investigations by GPs and improved communication between specialists and GPs can prevent duplication of resources and minimise the costs of investigations. Increased awareness of the efficacy of simple treatment modalities can increase their utilisation. Streamlining of investigation and management requires a multidisciplinary approach and both patient and service provider education.

Key Words

Osteoarthritis, knee, treatment, investigation

Background

With increasing life expectancies and greater proportions of people in older age groups, the burden of chronic disease is on the rise. Osteoarthritis (OA) affects 15% of Australians⁽¹⁾. At the end of 2008 this equated to over 3.2 million Australians suffering from the condition. This is expected to increase considerably as only 5% of Australians under 40 have symptomatic OA where as 50% of woman over 85 are symptomatic⁽²⁾. The Australian Orthopaedic Association National Joint Registry shows that over 38000 total knee replacements are performed in Australia each year⁽³⁾.

There have been many studies into conservative treatment modalities for early to moderate osteoarthritis. Treatments such as paracetamol, non-steroidal anti-inflammatory drugs (NSAIDs), regular low impact aerobic exercise, physiotherapy and weight loss have high level evidence to support their efficacy⁽⁴⁾.

With the ongoing rise in prevalence of OA it is going to be important to suitably investigate, correctly diagnose and then maximise early non-operative treatment modalities for these patients.

Aim

The aim of our study was to evaluate what treatments patients had been offered and what investigations had



been undertaken before presentation to a specialist orthopaedic outpatient clinic. These primary care treatments and investigations were then compared to current clinical guidelines.

Methods

The study was approved by the Ipswich and West Moreton district ethics committee. Patients older than 50 years without any pre-existing diagnosis of inflammatory disease were prospectively recruited from the Ipswich General Hospital (Queensland, Australia) orthopaedic department outpatient waiting list. Patients had been referred from their GP with a provisional diagnosis of knee osteoarthritis for an opinion on management. 95 patients with 100 symptomatic knees were recruited. Patients were only included as bilateral cases if they could not identify 'the worst' side.

These patients were given a questionnaire asking about what previous treatments they were offered by their GP and which they had personally employed. The treatments specifically enquired about were those with the highest levels of evidence reported in the 2008 non arthroplasty treatment guidelines from the American Academy of Orthopaedic Surgeons. (Refer table 1).

Patients were asked to bring all related investigations with them and then given a separate questionnaire asking which investigations had been performed. The investigations enquired about were [1] plain x-ray – noting whether these are weight bearing, [2] ultrasound, [3] computed tomography, [4] bone scan, [5] magnetic resonance imaging.

Results

The mean age of participants was 64 years, with 62% of participants being female. Evaluation of the treatment survey (refer table 2) has shown overall poor utilisation of the simple efficacious treatment modalities as recommended by the American Academy of Orthopaedic Surgeons⁽⁴⁾. Most significantly only 41% of patients had tried physiotherapy and 58% had tried weight loss, two modalities with high levels of evidence. Whilst 55% were using glucosamine which is not consistent with the guidelines.⁽⁴⁾

For further clarification patients who had not or were not using a treatment were asked the main reason why. The leading reason for not utilising weight loss and low impact exercise was that patients didn't believe they could do it. The resounding answer for the 59% of respondents who had not tried physiotherapy was that they had not been offered the service. Understandably the lead response for not using non-steroidal drugs was concern about side effects, whilst most patients didn't believe paracetamol would work for them.

The results have shown an array of investigations had been performed prior to these patients presenting to the orthopaedic outpatient department. (Refer table 3). Significantly 6% of patients had not undertaken a plain

radiograph prior to presentation and a further 21.5% did not have a weight bearing x-ray. This is a total of 27.5% of patients referred with a provisional diagnosis of knee OA that had not undertaken the gold standard weight bearing radiograph prior to presentation.

Discussion

There are long public waiting lists for both joint replacement and, prior to this similar waiting for a new case specialist orthopaedic outpatient appointment. It is important for patients with OA of the knee to be appropriately investigated in a timely and cost effective manner and efficacious non-operative management instituted by the GP, in order to limit morbidity of this increasingly common condition.

Our results have shown a disparity between the treatments undertaken and clinical guidelines. The reasons for not utilising weight loss and aerobic exercise was patients did not think they could do it. Whilst they were not frequently offered physiotherapy, were concerned about the side effects of NSAIDs and didn't believe paracetamol would be effective. This may indicate a lack of understanding of some treatments by the patients or their GPs. Another explanation is that the guidelines may not translate well to clinical practice.

The gold standard for diagnosis of knee osteoarthritis is a plain radiograph series – [1] a weight bearing semi-flexed postero-anterior view (the metatarsophalangeal view or MTP) [2] a lateral view and [3] a sunrise patella view.^(5, 6, 7)

The rationale for these views includes the fact that non-weight bearing radiographs have limited value in assessing cartilage loss.⁽⁸⁾ The major contact stresses in tibiofemoral articulation occur when the knee is flexed to about 28° and destruction of cartilage occurs in a more posterior site than is seen on conventional standing views.⁽⁸⁾ The MTP view provides radiographs that are more reproducible than a standing extension view.⁽⁶⁾ 9% of painful knees had isolated patellofemoral arthritis⁽⁹⁾ and adding either a skyline or lateral xray greatly increases the sensitivity of a radiograph series⁽¹⁰⁾ The skyline view has been recommended because it is more reproducible but the lateral is easier to produce and shows different information⁽¹⁰⁾

A better understanding of the rationale for these views and communication between the GP and specialist will allow GPs to ensure that in appropriate cases they can have the full series of films available to aid diagnosis before having to resort to other investigations.

With public health care performance and funding such an ongoing and topical issue it is evident that although there is a cheap efficacious investigation for knee OA, the use alternate investigations is common. Interestingly in the study group, seemingly moderate use of these investigations would have cost \$4426 for 21



investigations. This is significant when compared to the cost of the gold standard plain radiographs for the entire group would have cost \$4900⁽¹¹⁾.

Accurate diagnosis of knee OA by means of plain radiography is a cost effective process. If unnecessary investigations can be limited the health system can only benefit. Another possible opportunity for savings comes when considering the frequency of plain radiography requests. Patients often present with a series of x-rays, and repeat x-rays are often routinely used in the orthopaedic outpatient setting. This practice should be avoided considering only 4% of knees deteriorate radiographically in a twelve month period.⁽¹²⁾

The most common diagnosis for patients presenting with knee pain is osteoarthritis.⁽¹³⁾ While it is not accurate to retrospectively discount other investigations performed in this group in the context of what may have been undifferentiated knee pain, it is important to consider the cost implications and leading differential when ordering investigations. The plain radiograph series outlined is both useful and cost effective.

What can be done? Better communication between the orthopaedic department and the local GP to facilitate effective investigations, prompt diagnosis, timely referral and institution of effective non-operative management is important.

Cost benefit analyses are extremely complex. We do not know the cost of additional physiotherapy, or the cost of increased gastrointestinal, renal or cardiac complications from increased NSAID use. We also do not know the opportunity cost that would be involved in GPs spending more time managing patients with osteoarthritis.

One potential solution is that patients with OA would qualify for Medicare item numbers 721 for a general practitioner management plan (GPMP) and 723 for co-ordination of team care arrangements (TCA) for patients with a chronic disease as their osteoarthritis is a chronic condition that will affect the patient for longer than 6 months^(14,15).

These item numbers will allow the general practitioner the time needed to educate patients on their condition and institute appropriate management, including education to the benefits weight loss, low impact exercise and efficacy of paracetamol. The TCA also provides the patient with five free allied health referrals. This will allow them to access physiotherapy and dietician services with no expense to the patient. Whether these action plans prove cost effective will need future monitoring.

There are limitations of this study that need to be acknowledged. There is a selection bias to be reported, namely that the trial group were taken from a specialist outpatient waiting list and therefore would tend to represent the more severe cases seen in the community. However the appropriate investigations and management for patients with less severe symptoms should not change from those provided in the guidelines. Indeed it is important to consider the most

common diagnosis and investigate with the cheapest high yield investigation.

Another limitation of this cross sectional study comprises reporting errors from the study participants completing the surveys as they may have forgotten or not understand treatments or investigations. This was limited somewhat by the patients bringing their investigations with them when they presented to complete the survey. Also when considering investigation usage it must be remembered that patients consulting with primary care physicians with undifferentiated knee pain may present with symptoms and signs consistent with other diagnoses and be investigated as such, even if the end diagnosis is the more common one of OA.

Patients with knee OA can be appropriately investigated and streamlined into specialist care. They can also be commenced on simple efficacious treatments in the interim. This will reduce morbidity, prevent duplication of resources and minimise the cost associated with investigations.

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PEER REVIEW

Not commissioned. Externally peer reviewed.

CONFLICTS OF INTEREST

The authors declare that they have no competing interests

Tables

Table 1.
Evidence for non-operative management of knee osteoarthritis ⁽⁴⁾

Management	Evidence
Weight loss for patients BMI >25 (aim to lose 5% body weight)	Level I – A
Low impact aerobic exercise	Level I – A
Quadricep strengthening	Level II – B
NSAID	Level II – B
Paracetamol	Level II – B
Advise against Glucosamine / Chondroitin	Level I – A

Table 2.
Treatment Utilisation and demographics

Gender Distribution	Percentage	Mean age	64.45
Male	38%	Standard deviation	8.61
Female	62%		

Management	Number Tried	Percentage
Weight loss	58/ 100	58%
Low impact exercise	66/ 100	66%
Physiotherapy	41 / 100	41%
NSAID	59/ 100	59%
Paracetamol	74/ 100	74%
Glucosamine	55/ 100	55%

Table 3
Investigation Utilisation

	Cost ⁽⁸⁾	Number	Percentage
Plain x-ray	\$49	94/ 100	94%
Not weight bearing		20/ 94	21.5%
Ultrasound	\$109	14 / 100	14%
CT	\$220	1/ 100	1%
Bone scan	\$489	3 / 100	3%
MRI	\$403	3 / 100	3%