Arthritis Research UK Osteoarthritis and Crystal Disorders Clinical Studies
Group Annual Meeting: A Focus on Obesity
1st October 2014, 10.30am - 4pm
Friends House, 173 Euston Road, London

Meeting Summary

Present: Christine Thomas, Jo Cumming, Kathryn Martin, Anand Segar, Catherine Hankey, Abhishek Abhishek, Ed Roddy, Zoe Paskins, Sarah Rudkin (am), Hamish Simpson, David Hamilton, Fiona Watt, Fraser Birrell, Elspeth Wise, Sarah Kingsbury, Philip Conaghan, Michael Callaghan, Mike Blank (am), Rafael Pinedo-Villanueva, George Nuki, Weiya Zhang, Cathy Holt, Debbie Walsh, John Wilding (pm), David Haslam (am), Toby Smith, Martijn Steultjens.

Introduction

Professor Philip Conaghan, Chair, OA CSG opened the meeting with a summary of the OA CSGs activities over the previous year, as summarised in the OA CSG annual report (attached).

Strategies for effective weight loss

Professor David Haslam, Chair, National Obesity Forum, presented an overview of the growing problem of obesity and strategies for intervention.

Key messages:

- High weight loss is not necessary essential – even a very small weight loss can result in a large improvement in comorbidities such as diabetes
- Exercise is not sufficient to achieve weight-loss on its own, dietary modifications are essential
- Building low intensity exercise into daily life (e.g. walking to the bus) is as impactful and more sustainable than bursts of high intensity leisure exercise
- The only pharmacological agent licensed for weight loss in the UK, orlistat, shows good results, with 10% weight loss and 38% reduction in diabetes loss over a 4 year period. However, many people find it hard to tolerate.
- Bariatric surgery for severe obesity is associated with long-term weight loss and decreased overall mortality
- There is large variation across the UK with respect to access to weight-loss services
- Lessons may be learnt from the Karelia Health Project on Obesity in Finland and the EPODE International Network on Obesity Prevention.

Key references:

- http://www.kareliahealth.com/
- http://www.epode-international-network.com/
Evidence for weight loss as an effective intervention in OA

Dr Weiya Zhang, Associate Professor & Reader in Musculoskeletal Epidemiology, University of Nottingham, presented an overview of the evidence for weight loss as an intervention in OA.

Key messages:
- Weight is a key modifiable risk factor for OA (OR=3.91 [95%CI 3.32, 4.56])
- There is a linear dose response relationship between weight and OA: underweight OR=0.78, overweight OR=2.02, obese OR=3.91
- In the UK 25% of the population have a BMI ≥30 and this number is growing steadily
- Reduction in BMI from 30 to 25 would result in a 42% reduction in the prevalence of knee OA and a 52% reduction in the incidence of TKR.
- Based on current trials the effect size (ES) of weight loss is 0.16, which is not clinically meaningful, suggesting that weight loss does not have a significant effect on reducing pain in OA. The ES of paracetamol is 0.14 whilst exercise is 0.38 and NSAIDs have an ES of 0.29.
- Weight loss does significantly improve function
- There are no high quality trials examining the effect of weight loss on OA, partly because defining a placebo is not possible. The average weight-loss in trials conducted to date is also small (4kg) which may not be sufficient to have an effect. Current trial data is only short-term. Long-term data is also important.
- Pooling weight-loss trial data is questionable as the interventions used are often very different e.g. dietary advice, pharmacological, cognitive behavioural therapy
- Analysing high quality trials only (defined as n=100/arm) the ES for weight loss drops to 0.02, and the ES for exercise to 0.09
- A sub-analysis of those people who achieved the weight-loss goal may provide a clearer picture of the effect of weight-loss on OA
- What is the most effective metric to measure weight-loss? Should we measure kg reduction, % reduction in weight or reduction in abdominal circumference, for example. Better definitions are required.

Key References:

Strategies for effective weight maintenance

Dr Catherine Hankey, Senior Lecturer in Human Nutrition, University of Glasgow and Trustee, Association for the Study of Obesity (ASO), presented an overview of the current evidence surrounding strategies for effective weight maintenance and also provided a summary of the recent NICE guidelines for management of obesity. With thanks to Professor John Wilding, Head of Department of Obesity and Endocrinology, University of Liverpool, for his contributions to the discussion.

Key messages:
- Current guidelines suggest an individualised approach to dieting whereby a calorie limit is set at 600 calories less than an individual’s calorie requirements based on basal metabolic rate
Individual therapy shows better results than group therapy, which is associated with a number of problems including poor attendance and hierarchical issues.

Although GPs recognise obesity as important, time-restrictions prevent optimal management, whilst in secondary care obesity is often viewed as a primary care concern and it is therefore not addressed.

Weight maintenance is an even bigger challenge than initial weight loss. Compliance and long-term adherence is very difficult. Motivational strategies are important.

Weight management services are effective – 1/3 of people lose 5% body weight. However, compliance is poor - only 1/3 of those invited actually attend.

Evidence suggests that a small, maintained weight-loss is more beneficial than a potentially larger yo-yoing of weight-loss/weight-gain which may have negative metabolic effects.

There is currently no consensus on the definition of weight maintenance in adults. Adults naturally gain of 0.5-1kg/year from the age of 18 onwards. A number of different definitions of weight maintenance have been suggested, including 1) loss of at least 5% of body weight, or reduction of BMI by at least 1 unit, & keeping weight below this amount for at least 1 year (IOM, 1995); 2) weight regain of <3 kg (6.6 pounds) in 2 years & sustained reduction in waist circumference of at least 4 cm (NIH, 1998) and most recently 3) weight change <3% over the long term (Stevens, 2006).

Key references

- NICE guidelines [CG43] Obesity: Guidance on the prevention, identification, assessment and management of overweight and obesity in adults and children

The relationship between weight and outcomes for joint replacement surgery
Dr Rafael Pinedo-Villanueva Research Associate in Health Economics, University of Oxford presented an overview of the association between weight and joint replacement outcomes.

Key messages:
- Being overweight (BMI 26-30 kg/m2) is associated with a lower TKR mortality (HR 0.69, 95% CI 0.54-0.88) with respect to normal BMI (19-25 kg/m2). However this data may be confounded by overweight people undergoing a more rigorous pre-surgical assessment and therefore being generally fitter and less frail.
- Being overweight (BMI 26-30 kg/m2) is associated with lower THR mortality (HR 0.76, 95% CI 0.62-0.92) with respect to normal BMI (19-25 kg/m2).
- BMI has a small but statistically significant association with the risk of hip and knee revision, but absolute numbers are small and this increase may not be clinically significant.
- In general there is no increased risk of complications associated with increased BMI. A very small increased risk of infection and DVTs for both THR and TKR has been reported, but no increased risk of MI, stroke or UTI.
- BMI has a small, but not clinically meaningful effect on TJR outcomes.
- In summary, current referral practices seem to be effective in eliminating potential risks and unfavourable outcomes associated with obesity. Patients go through multiple filters prior to TJR and these may be more stringent for obese patients. However, healthcare usage may be higher even though the risks appear small. Surgery is often more technically difficult since the thicker layer fat prevents optimal knee rotation.

Key references:

Discussion
EW noted that she had been trying to work with the Arthritis Foundation to anglicise their Walking for Health brochure, but unfortunately had hit a brick wall. KM noted that as she used to work for AF she may be able to assist with revisiting this and getting it moving again.

The amount of money that the NHS spends on obesity is massively out of proportion to the scale of the problem. Government issues are therefore also important e.g. calorie labelling.

Improved information for GPs and patients could be important – The development of better patient/GP information could be supported collaboratively by Arthritis Research UK, the Association for the Study of Obesity and the National Obesity Forum.
Mechanical knee pain in OA is driven by three factors: weight, varus alignment and gait pattern. There is a strong interaction between weight and malalignment in existing OA. Altered biomechanics in obesity is likely to be the main mechanism driving OA, rather than an altered metabolic state. Therefore, a study which looks to address malalignment and gait, in addition to weight-loss, may have an improved effect on pain.

Clarification of the association between weight reduction and pain reduction is required. Small number back pain studies suggest that reduction in weight is associated with reduction in pain, and increased weight with increased pain. Information could potentially be obtained from patients’ pre- and post-bariatric surgery, since this population will have a large percentage of weight loss and a marked change in pain may be expected.

**Questions to be addressed:**

Outcome measures:
- What are the outcomes that should be included in obesity studies to understand joint pain?
- Could we add joint pain assessment on to other relevant weight-loss cohorts in order to obtain information on the effect of weight-loss on joint pain e.g. diabetes?

Targets for interventional studies:
- How much weight loss is required to have a beneficial effect on joint pain? E.g. a 5% reduction in someone with a BMI >35 may not be enough, but may be sufficient in someone with a BMI of 30.
- What definition of weight-loss should be used for a trial? E.g. percentage weight reduction, net weight loss etc.

Motivation:
- How do we motivate people to lose weight?
- There is a good evidence base for the effect of motivational interviewing in obesity. Could this model be modulated to fit an OA population as a basis for self-directed weight management trial? Ideally we would need to take an off-the-shelf package that is proven to work for weight-loss and add motivational interviewing to this. It will be important to look at both short-term and long-term adherence.

Trial design:
- Should the definitive trial be a complex package, combining e.g. exercise + nutritional intervention + motivational intervention?
- In the first instance, should we conduct a simple weight-loss trial, designed in a way that can inform a subsequent package of care trial? We need to ensure that we don’t re-invent the wheel, but can we learn from previous weight-loss trials and solve the problems in their design?
- Trial length? Most current studies are too short, so this should be addressed. However, we would need to ensure a low maintenance follow-up as drop-out rate may be high.

**Actions:**
- Elspeth Wise and Kathryn Martin to follow-up regarding AF Walking for Health brochure.
- Weiya Zhang to examine whether a sub-analysis of participants who achieved weight-loss goals within trials provides a clearer picture of the effect of weight-loss on OA.
- Potential systematic literature review to examine published evidence for the beneficial effect of weight-loss on joint pain.
- Follow-up meeting to be arranged for further discussion around issues pertaining to potential intervention trials.

**KNEEMO Initial Training Network for knee osteoarthritis**

Professor Martijn Steultjens Professor of Musculoskeletal Health, Glasgow Caledonian University, introduced the recently formed KNEEMO network and highlight opportunities.

For further information: https://www.facebook.com/pages/Kneemo/1489021854643209