

Foot & Ankle Research Review™

Making Education Easy

Issue 14 – 2012

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Abbreviations used in this issue

BMI = body mass index
JIA = juvenile idiopathic arthritis
MRI = magnetic resonance imaging
MTP 1 = first metatarsophalangeal joint
OA = osteoarthritis
OR = odds ratio
QoL = quality of life
RA = rheumatoid arthritis

Welcome to the fourteenth edition of Foot & Ankle Research Review.

In this edition I have focused on rheumatic diseases and the role the foot-care specialist undertakes. The role of the foot-care specialist in the rheumatology team is becoming recognised as a vital component in the integrated care given to patients by the multidisciplinary team. Increasingly, consultants and their teams are requesting specialist foot care services and it is suggested that the podiatrist is a key practitioner in the management of patients with rheumatic diseases. The articles I have chosen range from clinical trials to laboratory-based studies, but also three qualitative studies (*Graham et al. Foot health education for people with rheumatoid arthritis: some patient perspectives; Hendry et al. Room for improvement: patient, parent, and practitioners' perceptions of foot problems and foot care in juvenile idiopathic arthritis. Firth et al. Experiences of healthcare provision for foot ulceration occurring in people with rheumatoid arthritis*). Despite the high prevalence of foot issues, there remain several significant barriers to effective foot care and evidence indicates that the majority of patients with RA do not access such services.

I hope you enjoy reading the latest edition of Foot and Ankle Research Review and welcome any feedback.

Kind Regards,

Professor Keith Rome

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Tibialis posterior tenosynovitis and associated pes plano valgus in rheumatoid arthritis: EMG, multi-segment foot kinematics and ultrasound features

Authors: Barn R et al

Summary: To examine pes plano valgus associated with ultrasound-confirmed tibialis posterior tenosynovitis in RA, a cross-sectional study examined 10 patients with RA (median disease duration 3 years; range 1-18 years) and five controls using gait analysis including 3-D kinematics, kinetics and intramuscular electromyography. The RA patients walked slower than the controls and exhibited moderate levels of foot-related disability. The mean 28-joint disease activity score (DAS28) was 4.6. A higher level of tibialis posterior activity was observed in the RA group during the contact period of stance ($p = 0.007$), along with lower ankle joint power ($p = 0.005$), greater forefoot dorsiflexion ($p = 0.027$) and lower navicular height in the medial arch ($p = 0.023$). In the majority of RA patients, tibialis posterior exhibited tendon thickening and elevated fluid and power Doppler levels.

Comment: This UK study combines electromyography, 3-D motion analysis and high resolution ultrasound to evaluate mechanisms contributing to the development of flat foot deformity in individuals with RA compared to healthy controls. The study used 3-D motion analysis to quantify segmental foot motion during walking. Recent advances in motion capture technology afford improved spatial resolution and allow the definition of relatively small segments in the foot. While issues related to soft tissue artefact and the validity of skin markers to track underlying skeletal segments remain problematic, the chief advantage of 3-D motion analysis is that dynamic assessments of foot motion during functional activities, such as walking, can be performed. The authors noted reduced ankle joint power, lower navicular height and increased peak forefoot dorsiflexion in RA patients during walking compared with controls, confirming the altered kinematics noted in this clinical population. This article will be of interest to both clinicians and researchers who are considering non-surgical interventions such as footwear or foot orthoses. Future studies require larger sample sizes.

Reference: *Arthritis Care Res. 2012;Sept [Epub ahead of print]*

<http://onlinelibrary.wiley.com/doi/10.1002/acr.21859/abstract>

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Foot health education for people with rheumatoid arthritis: some patient perspectives

Authors: Graham AS et al

Summary: To examine patients' experiences of foot health education, dialogue with a focus group was recorded, transcribed and analysed using a structured thematic approach. The six themes that emerged as being considered important by this group of patients were: what the content and purpose of patient education should and should not be, the timing of information on foot health, the method of delivery, the ability of the patient to engage with foot health education and the patient/practitioner relationship.

Comment: This UK qualitative study adds to the knowledge base in the field and stimulates further discussion on patient education. The data provides themes relevant and helpful for the further development of patient education. I have highlighted a number of key themes that clinicians may find interesting. In the study, participants wanted patient education leaflets to support verbal information given during consultations. Participants described the experience of being 'listened to' more by female practitioners as resulting in positive outcomes. Patients in this study wanted access to information from a variety of sources, together with a tailored approach and verbal explanation, to meet their needs. This article would be of interest to clinicians in the field, but would the same results be similar in New Zealand and would we find similar findings in gout which is more prevalent in males? I strongly recommend you read this article.

Reference: *J Foot Ankle Res.* 2012;5(1):23

<http://www.jfootankleres.com/content/5/1/23>

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Room for improvement: patient, parent, and practitioners' perceptions of foot problems and foot care in juvenile idiopathic arthritis

Authors: Hendry GJ et al

Summary: In order to assess the perceived impact of foot problems and foot care in JIA, a UK study used an interpretative phenomenological approach from the perspectives of four adult patients, two parents of children with JIA, three paediatric rheumatologists, and six health professionals via semi-structured interviews and focus groups. Overall, six key themes related to the impact of foot problems and perceptions of foot care were derived: pain, impaired mobility, impaired ability to perform activities of daily living, difficulty with footwear, poor referral pathways and delayed access to care, and lack of evidence to support conservative foot care. Identified areas for development included improved referral pathways, shortening waiting times for initial consultation, greater attention to patient compliance and a need for better evidence for customised foot orthoses.

Comment: There is limited information about the impact of foot related problems from a patient and health care professional perspective. The findings are similar to studies relating to adults suffering from rheumatic diseases that lack evidence supporting conservative foot care. Although the authors discuss the need for evidence to support the use of customised foot orthoses, there should also be a discussion on appropriate footwear. Children's footwear has been publically debated in the recent New Zealand literature. However, the evidence in this population is sparse. An audit of footwear use in JIA would identify key areas for future studies. I recommend you review this article as it gives the clinician important information about patients, parents and health care professionals' perspectives.

Reference: *Arch Phys Med Rehabil.* 2012;Jul [Epub ahead of print]

[http://www.archives-pmr.org/article/S0003-9993\(12\)00546-1/abstract](http://www.archives-pmr.org/article/S0003-9993(12)00546-1/abstract)

Clinical presentation and self-reported patterns of pain and function in patients with plantar heel pain

Authors: Klein SE et al

Summary: This retrospective review examining symptom duration in patients with plantar fasciitis and its relation to demographic factors, pain intensity and location, previous treatment and self-reported pain and function, segregated data from 182 patients into two groups based on symptom persistence for more or less than 6 months. Pain severity (visual analogue scale score 6.6 vs 6.2), age, BMI, gender and comorbidities did not differ between the groups; neither did the levels of function on both the activity of daily living nor sports subscales of the Foot and Ankle Ability Measure (62 vs 65 and 47 vs 45, respectively). Patients with chronic symptom duration were likely to have tried more treatment options and providers.

Comment: This US study evaluated the relationship between clinical symptoms and a number of intrinsic and extrinsic risk factors. The study is rather disappointing, as no risk factors were identified and the study design was retrospective which does not indicate a cause and effect relationship. There is always controversy on defining acute and chronic plantar fasciitis. Chronicity based upon clinical symptoms is subjective and heavily biased towards patient recall. Recent studies have based chronicity in plantar fasciitis on medical imaging. For example, inflammation of the aponeurosis and the perifascial structures is characterised using MRI. In the article, the diagnosis of plantar fasciitis in this group of patients was based on the clinical impression of a fellowship-trained orthopaedic foot and ankle surgeon, not on a predetermined set of clinical criteria. Patient charts were the only source of information and the accuracy of the data provided by the patients is unknown. Because of failure to complete the forms provided, pain scores were not available for all patients.

Reference: *Foot Ankle Int.* 2012;33(9):693-8

<http://tinyurl.com/3x8jes>

Foot and Ankle Research Review



Independent commentary by Professor Keith Rome, School of Podiatry, AUT University, Auckland.

For full bio [CLICK HERE](#)

Research Review publications are intended for New Zealand health professionals.

Experiences of healthcare provision for foot ulceration occurring in people with rheumatoid arthritis

Authors: Firth J et al

Summary: The effect of open foot ulceration on health-related quality of life (HRQoL) was assessed in 23 non-diabetic RA patients (aged 45-88 years) from West Yorkshire who were interviewed and their responses analysed on a case- and theme-based framework. Two themes (patient journey and patient-professional relationships) and five sub-themes (access to care, knowledge acquisition, care pathways and continuity of care, and therapeutic patient-professional relationships and task-orientated care) were identified. The patient journey had a very variable course, which was altered by patient-specific (past ulcer experience, symptoms, knowledge, self-efficacy), service-specific (access to care, care pathways) and professional-specific (knowing and trusting somebody, holism) features.

Comment: This UK study has found similar findings to previous qualitative studies with established RA. Over 90% of all individuals with RA report moderate-to-severe foot pain, exposing a significant clinical challenge and a public health priority. Effective management of foot pain and prevention of foot deformity are the chief goals of intervention to this challenge. Increasingly, a team approach is used to institute multi-disciplinary care. Despite the high prevalence of foot issues, there remain several significant barriers to effective foot care, and evidence indicates that the majority of patients with RA do not access foot care. The authors conclude the need for clearer care pathways for patients affected by foot ulceration, improved patient education and better coordination of care. The protocol used in this study would be interesting to undertake in a podiatric rheumatology service based in New Zealand. I recommend you review the article and read the other two qualitative research articles published in this issue of Research Review.

Reference: *Musculoskeletal Care 2012;Oct [Epub ahead of print]*

<http://onlinelibrary.wiley.com/doi/10.1002/msc.1036/abstract>

Foot and ankle kinematics in rheumatoid arthritis: The influence of foot and ankle joint and leg tendon pathologies

Authors: Dubbeldam R et al

Summary: This study involving 25 patients with varying stages of RA explored the relationship between clinically observed pathologies of foot and ankle joints and leg tendons, and corresponding gait kinematics. Maximum MTP 1 dorsiflexion at pre-swing was related to reduced MTP 1 passive motion, MTP 1 erosion and synovitis, midfoot erosion and synovitis and hindfoot erosion, determined by MRI. During single-stance, midfoot pronation range of motion was related to Achilles tendon involvement and subtalar alignment, and hindfoot eversion range of motion was related to peroneus longus tendon involvement and subtalar alignment. The tibialis posterior tendon was not involved as an independent factor influencing ankle or foot kinematics.

Comment: This Dutch study examined the relationship between clinical assessments of the foot and ankle, MRI and foot function during walking, assessed using 3-D motion analysis in individuals with RA. The early identification of localised foci of inflammation is critical to the current paradigm of targeted therapy. The study should be commended for the use of clinically relevant image acquisition and analysis techniques, making the results of particular interest to the clinician. Due to the highly detailed nature of information obtained in the study, they are limited to small sample sizes. Larger studies are urgently needed, especially those that are able to address adaptations to important physical activities, including increasing walking ability and duration. Finally, the study was cross-sectional by design, yet clinicians and researchers both appreciate that valuable insights may be obtained with studies using a longitudinal design.

Reference: *Arthritis Care Res. 2012; Sept [Epub ahead of print]*

<http://onlinelibrary.wiley.com/doi/10.1002/acr.21852/abstract>

Effect of custom-made foot orthoses in female hallux valgus after one-year follow up

Authors: Reina M et al

Summary: The use of custom-made foot orthotics for preventing the progression of mild-to-moderate hallux valgus was investigated in this prospective trial involving 54 women with the condition. Subjects were divided into two groups assigned to either wear or not wear (controls) such orthoses. At 12 months, there were no significant differences from baseline in either group for first intermetatarsal and hallux abductus angles and there was no difference between groups at either time point in these angles. The authors concluded that when used for a 12-month period, custom-made orthoses appear to have no effect in the evolution of mild-to-moderate hallux valgus.

Comment: This Spanish study will be of interest to both clinicians and researchers as foot orthoses have been used to treat this condition and are aimed at preventing progression of the deformity. The theoretical underpinning to this small clinical trial is that excessive foot pronation is the primary cause of hallux valgus. However, hallux valgus is multifactorial and other factors were not taken into account in the current study. The results are disappointing but there are a number of potential issues that need to be considered. The custom-made foot orthoses were devices that accommodated the foot rather than functionally controlled the sub-talar joint. The use of x-ray imaging as the only outcome is limited together with only women being used in the study. Future studies may want to investigate pain, impairment, disability and foot function with the use of foot orthoses.

Reference: *Prosthet Orthot Int. 2012; Jun [Epub ahead of print]*

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Racial differences in foot disorders and foot type: The Johnston County Osteoarthritis Project

Authors: Golightly YM et al

Summary: Racial differences in the frequency of structural foot disorders and pes planus, and cavus foot types were found in a cohort of 1691 Caucasian and African-American individuals aged >50 years (mean 69 years; mean BMI 31.5 kg/m²) taking part in the Johnston County Osteoarthritis Project. Among the whole cohort, the rates of foot disorders were as follows: hallux valgus (64%), hammer toes (35%), overlapping toes (34%), pes planus (23%). African-Americans were almost three times more likely to have pes planus than Caucasians and almost five times as likely to have pes cavus or Taylor's bunions. Non-obese (BMI <30 kg/m²) African-Americans were also more likely than non-obese Caucasians to have hammer toes (adjusted OR 2.64; 95% CI 1.88–3.70), hallux valgus (adjusted OR 2.01; 95% CI 1.39–2.92) and overlapping toes (adjusted OR 1.53; 95% CI 1.09–2.13).

Comment: This US study demonstrates significant difference in foot types between Caucasians and African-Americans. This is an interesting study, as similar findings have been reported between Maori and Caucasian feet (Available from: [http://www.gaitposture.com/article/S0966-6362\(12\)00018-5/abstract](http://www.gaitposture.com/article/S0966-6362(12)00018-5/abstract)). The findings from this article should be of interest to both clinicians and researchers. Prescribing foot orthoses, advice on footwear and foot education should take into account difference in foot types across different ethnicities especially when any management plans are implemented.

Reference: *Arthritis Care Res.* 2012; Jun [Epub ahead of print]

<http://onlinelibrary.wiley.com/doi/10.1002/acr.21752/abstract>

Pressure and pain in systemic sclerosis/scleroderma—an evaluation of a simple intervention (PISCES): randomised controlled trial protocol

Authors: Alcacer-Pitarch B et al

Summary: A pilot project involving 14 individuals with systemic sclerosis and 14 healthy controls, conducted in preparation for the pragmatic, phase III, multicentre PISCES trial (Pressure and pain In Systemic Sclerosis/Scleroderma), has confirmed the presence of foot-related impairment and reduction in foot function in such individuals, and demonstrates a link to mechanical aetiologies. In the pilot project, patients with systemic sclerosis reported worse foot pain on a 100mm visual analogue pain scale compared with controls (36.8mm vs 2.2mm) and markedly higher forefoot pressures across a range of variables (peak pressure time integrals and peak plantar pressures were particularly high over the first metatarsophalangeal joint). Thirteen of the individuals with systemic sclerosis reported that they would benefit from interventions intended to reduce their foot symptoms. The proposed trial will involve 140 patients with systemic sclerosis randomised to either a commercially available pressure relieving and thermally insulating insole, or a sham insole with no cushioning or thermal properties. The primary endpoint of reduction in pain measured using the Foot Function Index Pain subscale will be measured at 12 weeks.

Comment: Foot problems associated with systemic sclerosis include: Raynaud's phenomenon, which sometimes can progress to tissue loss/ulceration, subcutaneous calcinosis, skin thickening, callus formation, tendonopathy, foot ulcers, joint space narrowing, bone demineralisation, joint subluxation, joint margin erosions and degenerative changes. There are parallels between some of the foot symptoms seen in systemic sclerosis and those in people with RA. There is little evidence on the impact of impairment and disability of the foot and ankle of people who have been diagnosed with systemic sclerosis. Understanding foot and ankle characteristics will provide a useful insight for future podiatric interventions for people with systemic sclerosis and will be of interest to clinicians and researchers. In New Zealand, foot problems associated with systemic sclerosis have not been studied and future work needs to be conducted in this area.

Reference: *BMC Musculoskelet Disord.* 2012; Feb [Epub ahead of print]

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3395828/pdf/1471-2474-13-11.pdf>

Impact of first metatarsophalangeal joint osteoarthritis on health-related quality of life

Authors: Bergin SM et al

Summary: To determine whether there are differences in the foot-specific and general health-related quality of life (HRQoL) of people with and without radiologically confirmed MTP 1 joint OA, this study recruited 43 individuals (mean age 50 years) with the condition and 43 age, sex and BMI-matched controls. All domains in the Foot Health Status Questionnaire were significantly lower in the case group compared with controls (mean foot pain 55.5 vs 93.0; foot function 73.8 vs 96.9; general foot health 50.2 vs 89.7; footwear 39.1 vs 76.6). Individuals with MTP 1 joint OA also had significantly lower scores in the physical functioning domain of the Short-Form-36 questionnaire compared with controls (mean 82.8 vs 95.2).

Comment: This Australian study illustrates the issues of pain, disability and impairment in this common condition. The use of reliable and validated outcome tools are more frequently being used in research and clinicians may want to consider using outcome measures to document interventions used in everyday clinical practice for this very common musculoskeletal foot condition. The study deals with one issue many studies do not include: the problem with footwear. Previous studies report on many outcomes, but do not include the issues with footwear. Future studies need to consider footwear especially when dealing with interventions such as shoe inserts or foot orthoses. I strongly recommend you read this article and consider patients with osteoarthritic problems of the MTP joint and the issues of health.

Reference: *Arthritis Care Res.* 2012; May [Epub ahead of print]

<http://onlinelibrary.wiley.com/doi/10.1002/acr.21729/abstract>

Foot-related healthcare use in patients with rheumatoid arthritis in an outpatient secondary care center for rheumatology and rehabilitation in the Netherlands: a cohort study with a maximum of 15 years of follow-up

Authors: Marsman AF et al

Summary: This study evaluated foot-related healthcare use over time (1995 to 2010) in a cohort of 1087 recent-onset RA patients in an outpatient secondary care centre for rheumatology and rehabilitation in the Netherlands. Analysis revealed that during the course of their disease, 32.9% of patients visited a podiatrist in secondary care and that for most patients this visit took place during the first year post-diagnosis (such visits significantly decreased in the ensuing years). A rehabilitation physician was visited for foot complaints by 9% of patients, with peak prevalence between the 10th and 11th year and during the 14th year of follow-up, while 5.3% of patients with foot complaints visited an orthopaedic surgeon, with a significant increase in visits over time, and 7.5% of patients visited the multidisciplinary foot-care clinic (this was significantly associated with visits to a rehabilitation physician).

Comment: This Dutch study gives an insight into the role of the podiatrist in a multidisciplinary rheumatology team. There is strong belief that podiatrists play an important role in rheumatic diseases. The article demonstrates that in the Netherlands the podiatrist plays an important role in the first year after diagnosis. This is an important time-frame as the potential to 'slow-down' the detrimental impact on the musculoskeletal foot is highest within the first few years of diagnosis. This complements a recent article that supports the notion of a 'window of opportunity' (Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2883976/>). The role of the foot-care specialist is highlighted and recent evidence in New Zealand supports this notion.

Reference: *Arthritis Care Res.* 2012; Jul [Epub ahead of print]

<http://onlinelibrary.wiley.com/doi/10.1002/acr.21787/abstract>

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