FOOT AND ANKLE PAIN PHENOTYPES: LATENT CLASS ANALYSIS FROM THE CLINICAL ASSESSMENT STUDY OF THE FOOT

Aranghan Lingham, Trishna Rathod, Martin J. Thomas, Michelle Marshall and Edward Roddy
Primary Care and Health Sciences, Keele University, Staffordshire, UK

Background: Foot and ankle pain are common problems that affect 24% and 12% of older adults, respectively. Many studies have estimated the prevalence of foot pain in specific anatomical locations and investigated associated risk factors, but few studies have examined the extent to which pain in different parts of the foot and ankle complex coexist. The aim of this study was to investigate the existence of distinct phenotypes of foot and ankle pain and associated symptoms and risk factors.
Methods: Adults ≥50 years of age registered with four general practices in North Staffordshire were mailed a health survey questionnaire, irrespective of foot-related health care consultation. Participants reporting foot pain in the last month indicated the location of foot pain by shading a foot manikin. Distinct phenotypic classes of pain in different foot locations were investigated by latent class analysis and their association with symptoms and risk factors were assessed using analysis of variance and chi-square test.

Results: A total of 5109 completed postal questionnaires were received (adjusted response rate 56%) and 4455 with complete foot pain and manikin data were included in this analysis [mean age 65 years (s.d. 9.8), 49% male]. The most frequently affected pain regions were the big toe (15%), lesser toes (14%) and the midfoot (13%), with the least commonly affected being the plantar heel (6%) and ankle (6%). Of those with foot/ankle pain (n = 1356), 1215 (90%) had pain in more than one region and 825 (61%) had bilateral pain. Latent class analysis demonstrated six distinct classes of foot and ankle pain: no pain (71%, n = 3161), bilateral forefoot/midfoot pain (4%, n = 190), bilateral hindfoot/midfoot pain (5%, n = 238), left forefoot/midfoot pain (8%, n = 370), right forefoot/midfoot pain (5%, n = 238) and bilateral widespread foot pain (6%, n = 258). People in class 2 (bilateral forefoot/midfoot) were more likely to have hallux valgus than those in class 3 (hindfoot/midfoot)—39 vs 30% (P < 0.001). People in class 6 (bilateral widespread foot pain) were significantly more likely to be female, obese and have medical co-morbidities, and had lower mental and physical component scores and higher foot pain scores than other classes. Age did not differ between classes.

Conclusion: Foot pain was commonly bilateral, while unilateral pain occurred more commonly in the forefoot than the hindfoot. Foot and ankle pain frequently involved multiple regions, and six distinct classes of foot pain location were identified. These distinct phenotypes were associated with differing symptoms and risk factor profiles. Further work should explore the phenotypic characteristics of people in these classes in more detail and examine their outcome over time.

Disclosure statement: The authors have declared no conflicts of interest.