trajectories of foot pain Severity over SEVEN years and relationship to potential prognostic factors: the Clinical Assessment Study of the Foot

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**Background:**

Foot pain is common and disabling in older adults however little is known about its course. The objective of this study was to identify foot pain trajectories over seven years and examine the associations between progressive symptom trajectories and potential prognostic factors.

**Methods:**

All adults aged ≥50 years registered with four general practices in North Staffordshire, UK were mailed a health survey at baseline. Those reporting foot pain in the previous 12 months were invited to attend a research clinic that included a standardised interview, physical examination, and plain radiographs of the feet. Follow-up was by repeated postal surveys at 18 months, three years, 54 months, and seven years. Trajectories of repeated measures of foot pain severity in the previous month (10-point numerical rating scale) were identified using Latent Class Growth Analysis (LCGA). Logistic regression was undertaken to explore the relationship between these trajectories and both person-level and foot-level prognostic factors adjusted for covariates (age, gender, and body mass index).

**Results:**

Of 560 adults with foot pain attending baseline research clinics, 425 (76%) provided data at baseline and ≥two follow-up time-points and were included in the analysis. The optimum LGCA model for foot pain severity was a 4-class model with the following trajectories: mild improving pain (n=109, 26%); moderate improving pain (n=179, 42%); moderate persistent pain (n=122, 29%); severe persistent pain (n=15, 4%). Compared with individuals with mild/moderate improving pain trajectories, those with moderate/severe persistent pain trajectories over 7 years did not differ significantly by age, sex, foot posture or radiographic foot OA phenotype at baseline, but were more likely to be overweight/obese. After adjustment for covariates, these less favourable long-term trajectories were associated with lower socioeconomic position, poorer physical and mental health, catastrophising, greater foot-specific functional limitation (Manchester Foot Pain and Disability Index), and self-reported hallux valgus at baseline (table 1).

**Conclusion:**

Over a 7-year period, one-third of individuals had persistent moderate to severe pain. Targeting interventions to modifiable prognostic factors such as obesity and hallux valgus may have the potential to improve long-term outcomes in people with foot pain.

**DISCLOSURES AND CONFLICTS OF INTEREST**

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Table 1. Baseline prognostic factors and the association with a persistent pain trajectory

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Baseline factors** | **Mild/moderate improving pain N=288** | **Moderate/severe persistent pain N=137** | **Crude OR****(95% CI)** | **Adjusted for age, sex and BMI****OR (95% CI)** |
| Age, years; mean (SD) | 64.28 (7.68) | 64.54 (8.06) | 1.00 (0.98, 1.03) | 1.00 (0.98, 1.03) |
| Age categories; N (%): |  |  |  |  |
|  50-59 | 83 (28.82) | 41 (29.93) | 1.00 | 1.00 |
|  60-69 | 134 (46.53) | 55 (40.15) | 0.83 (0.51, 1.35) | 0.83 (0.50, 1.36) |
|  ≥70 | 71 (24.65) | 41 (29.93) | 1.17 (0.68, 2.00) | 1.19 (0.69, 2.06) |
| Female gender; N (%) | 153 (53.13) | 71 (51.82) | 0.95 (0.63, 1.43) | 0.95 (0.63, 1.43) |
| BMI, kg/m2; mean (SD) | 29.72 (5.28) | 31.23 (5.67) | 1.05 (1.01, 1.09) | 1.05 (1.01, 1.09) |
| BMI categories; N (%): |   |  |  |  |
|  <20.0 | 4 (1.40) | 1 (0.74) | 0.79 (0.08, 7.62) | 0.81 (0.08, 7.93) |
|  20.0-24.9 | 44 (15.38) | 14 (10.29) | 1.00 | 1.00 |
|  25.0-29.9 | 118 (41.26) | 52 (38.24) | 1.38 (0.70, 2.75) | 1.38 (0.69, 2.74) |
|  30.0-34.9 | 79 (27.62) | 38 (27.94) | 1.51 (0.74, 3.09) | 1.51 (0.74, 3.07) |
|  ≥35.0 | 41 (14.34) | 31 (22.79) | 2.38 (1.11, 5.09) | 2.37 (1.11, 5.07) |
| Attended higher education; N (%) | 85 (30.47) | 29 (21.64) | 0.63 (0.39, 1.02) | 0.67 (0.41, 1.10) |
| Occupational class; N (%): |  |  |  |  |
|  Managerial & professional | 89 (32.25) | 22 (17.32) | 1.00 | 1.00 |
|  Intermediate | 50 (18.12) | 32 (25.20) | 2.59 (1.36, 4.93) | 2.65 (1.38, 5.09) |
|  Routine & manual | 137 (49.64) | 73 (57.48) | 2.16 (1.24, 3.72) | 2.13 (1.23, 3.70) |
| Foot posture index (rasch); mean (SD) |   |  |  |  |
|  Left foot | 2.48 (1.73) | 2.40 (2.08) | 0.98 (0.88, 1.09) | 0.97 (0.87, 1.09) |
|  Right foot | 2.56 (1.79) | 2.48 (1.99) | 0.98 (0.88, 1.09) | 0.98 (0.87, 1.09) |
| Radiographic foot OA phenotype; N (%): |  |  |  |  |
|  No/minimal | 181 (65.58) | 78 (60.47) | 1.00 | 1.00 |
|  1st MTPJ | 57 (20.65) | 27 (20.93) | 1.10 (0.65, 1.87) | 1.11 (0.65, 1.89) |
|  Polyarticular | 38 (13.77) | 24 (18.60) | 1.47 (0.82, 2.61) | 1.33 (0.73, 2.44) |
| SF12 – PCS; mean (SD) | 41.90 (11.60) | 32.41 (10.48) | 0.93 (0.91, 0.95) | 0.93 (0.91, 0.95) |
| SF12 – MCS; mean (SD) | 51.76 (9.62) | 45.71 (11.44) | 0.95 (0.93, 0.97) | 0.95 (0.93, 0.97) |
| Short Physical Performance Battery; mean (SD) | 9.09 (2.35) | 7.33 (2.72) | 0.77 (0.70, 0.84) | 0.74 (0.68, 0.82) |
| HADS – anxiety; mean (SD) | 6.08 (3.92) | 8.60 (4.56) | 1.15 (1.09, 1.21) | 1.15 (1.10, 1.22) |
| HADS – depression; mean (SD) | 4.35 (3.20)  | 7.24 (4.25) | 1.23 (1.16, 1.31) | 1.23 (1.15, 1.30) |
| Catastrophizing beliefs; median (IQR) | 0 (0, 2) | 3 (0, 5) | 1.39 (1.26, 1.54) | 1.39 (1.26, 1.54) |
| MFPDI Pain subscale (rasch); mean (SD) | -0.71 (1.43) | 0.82 (1.22) | 2.33 (1.91, 2.83) | 2.37 (1.93, 2.91) |
| MFPDI Function subscale (rasch); mean (SD) | -1.41 (1.85) | 0.61 (1.84) | 1.77 (1.55, 2.02) | 1.81 (1.57, 2.08) |
| Hallux valgus (either foot); N (%) | 111 (38.54) | 78 (56.93) | 2.11 (1.39, 3.19) | 2.36 (1.52, 3.64) |

OR, Odds ratio; CI, Confidence interval; SD, standard deviation; N, number; BMI, body mass index; MFPDI, Manchester Foot Pain and Disability Index; OA, osteoarthritis; MTPJ, metatarsophalangeal joint; SF-12, Short-Form 12; PCS, physical component score; MCS, mental component score; HADS, Hospital Anxiety and Depression Scale; IQR, inter quartile range.