

THE ODDS OF HAND PAIN AND OSTEOARTHRITIS IN INDIVIDUALS WITH A HISTORY OF CRICKET-RELATED HAND INJURY

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ABSTRACT

PURPOSE

Hand osteoarthritis (OA) is the most prevalent type of OA in the general population. In the UK 3% of men and 8% of women aged 45-64 years have hand or wrist OA, with the prevalence increasing to 5% of men and 9% of women aged 65-74 years. However, the aetiology of hand OA is not well characterised. Unlike the knee, where the relationship between injury and OA is well established, there is a need for further research investigating the relationship between hand injury and OA. In cricketers, hand injuries are highly prevalent, however the relationship between hand injury and hand OA is poorly understood.

This purpose of the study was to describe the odds of hand pain (on most days of the last month) in former cricketers, and the odds of hand OA (self-reported, physician diagnosed) in current and former cricketers with a history of cricket-related hand injury.

METHODS

28,152 current and former cricket players registered on a national UK database managed by the England and Wales Cricket Board were invited to complete an online questionnaire. 2,598 individuals completed the questionnaire. For this study, participants must have played ≥ 1 season of cricket and be aged ≥ 30 years.

Injury was assessed by asking participants if they had ever had a cricket-related hand or finger injury 'leading to more than 4 weeks of reduced participation in exercise, training or sport'. Pain was assessed in former cricketers only (to minimise confounding by the presence of a current injury) by asking if they 'experience pain in the hand or finger on most days of the last month'. Hand OA was assessed in all participants by asking if they had 'ever been told by a doctor that they have osteoarthritis (wear and tear or joint degeneration) in the hand or

finger joints'. For all questions participants were given left/ right/ both hands and don't know options.

Logistic regression was used to assess the relationship between hand injury and outcomes in the dominant (hand used to bowl or throw) and non-dominant hands separately. Unadjusted and adjusted odds ratios (OR), and 95% confidence intervals (CIs) were reported. All analyses were adjusted in a step-wise manner for age, number of seasons played, and the highest standard of cricket played (higher standard: 'international/ county/ premiere league/ academy/ county-age-group' vs. lower standard: 'university/ school/ village/ social'). All underlying assumptions for logistic regression were satisfied. Participants with missing data or 'don't know' responses were excluded from analyses.

RESULTS

2071 participants met the eligibility criteria for this study, 45% (n=924) were former cricketers. Former cricketers, were aged a mean 60 years (SD 11; range 30-94) years, had a mean BMI (SD 6) 27 kg/m², played a mean 31 (SD 14; range 1-66) seasons of cricket, and 38% (n=341) had played cricket at a high standard. All participants (current and former cricketers) were aged a mean 55 (SD 12; range 30-94) years, had a mean BMI 28 kg/m² (SD 5), had played a mean 31 (SD 14; range 1-68) seasons of cricket, and 37% (n=754) had played cricket at a high standard.

In former cricketers, 95 participants (11%) reported dominant hand injury, and 92 participants (10%) reported non-dominant hand injury. Participants with dominant hand injury had a 1.7 (95% CI 1.1 to 3.7) times greater odds of reporting hand pain, compared to those with no injury (Table 1). The odds of hand pain in those with dominant-hand injury was similar after adjustment for confounders (OR 2.0 (95% CI 1.0 to 3.8)) (Table 1). Non-dominant hand-injury was associated with an increased odds of hand pain (OR 2.1; 95% CI 1.0 to 4.3), in the adjusted analysis only (Table 1).

In all cricketers, 257 participants (13%) reported a history of dominant hand injury and 240 participants (12%) reported a non-dominant hand injury. Participants with dominant hand injury had a 2.1 (95% CI 1.2 to 3.6) times greater odds of hand OA, compared to those with no injury (Table 2). Participants with non-dominant hand injury had a 2.7 (95% CI 1.7 to 5.0) times greater odds of hand OA, compared to those with no injury. The odds of hand OA increased in participants reporting a dominant (OR 2.5; 95% CI 1.5 to 4.5) and non-dominant (OR 3.0; 95% CI 1.6 to 5.8) hand-injury, in the adjusted analyses (Table 2).

CONCLUSIONS:

Individuals who sustained a cricket-related hand injury, had a higher odds of reporting ipsilateral hand pain and OA, compared to individuals reporting no cricket-related hand injury. This is one of the first studies to analyse the association between cricket-related hand injury and hand pain and OA. Prospective studies would help to better understand this relation.

Table 1. Logistic regression analysis investigating the relationship between a history of hand injury and ipsilateral hand pain in former cricketers

| IPSILATERAL HAND INJURY | DOMINANT HAND PAIN n= 78 | NON-DOMINANT HAND PAIN n= 64 |
|--|---|---|
| Unadjusted OR (95% CI) | 1.7 (1.1 to 3.7) p= 0.034 | 1.9 (1.0 to 3.8) p= 0.068 |
| Adjusted for Age | 2.0 (1.1 to 3.7) p= 0.036 | 1.9 (1.0 to 3.8) p= 0.079 |
| Adjusted for Age, Seasons Played | 2.1 (1.1 to 4.0) p= 0.029 | 1.9 (0.9 to 3.9) p= 0.071 |
| Adjusted for Age, Seasons Played, Standards of Play | 2.0 (1.0 to 3.8) p= 0.048 | 2.1 (1.0 to 4.3) p= 0.047 |

All results are odds ratios (OR) and 95% CIs.

Injury was assessed by asking participants if they had ever had a cricket-related hand or finger injury 'leading to more than 4 weeks of reduced participation in exercise, training or sport'.

Pain was assessed by asking participants if they 'experience pain in the hand or finger on most days of the last month'.

Dominance was defined as the hand used to bowl or throw.

Adjusted for age; number of seasons played; standards of play: higher standard (coded as 1): 'international/ county/ premiere league/ academy/ county-age-group' vs lower standard (coded as 0): 'university/ school/ village/ social'.

Table 2. Logistic regression analysis investigating the relationship between a history of hand injury and ipsilateral hand osteoarthritis (OA) in current and former cricketers

| IPSILATERAL HAND INJURY | DOMINANT HAND OA n= 81 | NON-DOMINANT HAND OA n= 56 |
|----------------------------------|---------------------------------------|---|
| Crude OR (95% CI) | 2.1 (1.2 to 3.6) p= 0.007 | 2.7 (1.7 to 5.0) p= 0.003 |
| Adjusted for Age | 2.3 (1.3 to 3.9) p= 0.003 | 2.9 (1.5 to 5.3) p= 0.021 |
| Adjusted for Age, Seasons Played | 2.5 (1.4 to 4.4) p= 0.001 | 3.2 (1.7 to 6.0) p= 0.024 |

Adjusted for Age, Seasons Played,
Standards of Play

2.5 (1.5 to 4.5)
p= 0.001

3.0 (1.9 to 6.5)
p= 0.024

All results are odds ratios (OR) and 95% CIs.

Injury was assessed by asking participants if they had ever had a cricket-related hand or finger injury 'leading to more than 4 weeks of reduced participation in exercise, training or sport'.

OA was assessed by asking participants if they had 'ever been told by a doctor that they have osteoarthritis (wear and tear or joint degeneration) in the hand or finger joints'.

Dominance was defined as the hand used to bowl or throw.

Adjusted for age; number of seasons played; standards of play: higher standard (coded as 1): 'international/ county/ premiere league/ academy/ county-age-group' vs lower standard (coded as 0): 'university/ school/ village/ social'.