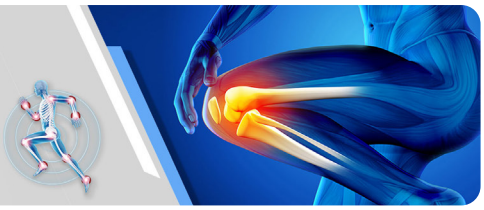
fortune Journals

Research Article

JOURNAL OF ORTHOPAEDICS AND SPORTS MEDICINE

ISSN: 2688-5115



The Socioeconomic Impact of Anterior Cruciate Ligament Injury: The Patients Perspective

Charles Gamble[1*], Mazyad Atassi[1,2*], Lee Hoggett[3], Bilal Barkatali[4]

Abstract

Introduction: Anterior cruciate ligament (ACL) injuries have significant impact on patients. Knee function and return to sport post injury is well evidenced however personal financial impact and duration of time off work is less well known. This study evaluates the perceived socioeconomic impact to the patient following ACL injury treated with ACL reconstruction (ACLR).

Method: A retrospective case report of 92 patients who had ACLR between September 2014 and December 2022. Operative techniques included bone-patella tendon-bone graft, hamstring graft and quadriceps graft. Patients were contacted retrospectively via telephone and answered a standardised questionnaire. The primary outcome was socioeconomic impact of ACL injury. Secondary outcomes included: mean time off work, sick leave taken and return to sport.

Results: Patients took an average of 9 weeks off work (0-52 weeks), with 48% taking sick leave from work. Financial losses from work averaged £3581 (£300-£10,000). Furthermore, there was an average additional personal cost of £796 (£100-£3500) secondary to their injury. This was common for alternative travel arrangements. 90% of patients were able to return to playing some form of sport, taking an average of 56 weeks (8-208 weeks). 40% of participants returned at a reduced level and 25% returned at their preinjury level.

Discussion: Patient reported data on time away from work and personal financial loss following an ACL injury is scarce. This study provides key information that can inform surgeons when consulting patients on ACLR. Further studies are required to compare non operative and operative treatment modalities and their socioeconomic impact.

Keywords: Anterior cruciate ligament injury; Orthopaedic; Sports

Introduction

Anterior cruciate ligament (ACL) injury is a common injury and can have significant impact on patients. 6664 ACL reconstructions (ACLR) are undertaken annually in the UK [1] and 69 per 100,000 people were affected in the United States between 1990 and 2010 [2]. Therefore, having a strong understanding of the impact on patients is a key element of treating ACL injuries for all orthopaedic clinicians. This study evaluates the perceived socioeconomic impact to the patient following ACL injury treated with ACLR.

There is limited literature that describes the financial impact to the patient directly, however the financial impact on society has been better researched.

Affiliation:

[1]Royal Stoke Hospital, Stoke-on-Trent, GBR, Newcastle Rd, Stoke-on-Trent ST4 6QG, United Kingdom

[2]York and Scarborough Teaching Hospitals NHS Foundation Trust, York Hospital, Wigginton Road, York, YO31 8HE, United Kingdom

[3]Health Education Northwest, Regatta Place, Brunswick Business Park, Summers Road, Liverpool, United Kingdom

[4]Orthteam Centre, Spire Manchester Hospital, 170 Barlow Moor Rd, Manchester M20 2AF, United Kingdom

***Corresponding Author:**

Charles Gamble, Royal Stoke Hospital, Stoke-on-Trent, GBR, Newcastle Rd, Stoke-on-Trent ST4 6QG, United Kingdom.

Mazyad Atassi, York and Scarborough Teaching Hospitals NHS Foundation Trust, York Hospital, Wigginton Road, York, YO31 8HE, United Kingdom.

Citation: Charles Gamble, Mazyad Atassi, Lee Hoggett, Bilal Barkatali. The Socioeconomic Impact of Anterior Cruciate Ligament Injury: the Patients Perspective. Journal of Orthopedics and Sports Medicine. 6 (2024): 152-155.

Received: May 16, 2024
Accepted: July 18, 2024
Published: July 29, 2024

Gamble C, et al., J Ortho Sports Med 2024
DOI:10.26502/josm.511500154

Mather et al. [3] reported that acute ACLR was both more cost effective for society and resulted in better quality-adjusted life years gained. In an earlier study Mather et al reported mean lifetime cost to society of ACLR to be $38,121, whereas rehabilitation was $88,538 [4]. The amount of sick leave taken following ACL injury has been evaluated by Arimaa et al. [5] who reported a mean of 65 days from reconstruction to returning to work. Additionally, 99% of patients returned to work within 1 year from operation date. Key contributors to delayed return to work were identified as age >40, manual labour and preoperative absences [5]. Similarly, in Sweden, one study found ACL injury resulted in 56.9 and 88.5 sick leave days in acute reconstruction and delayed reconstruction respectively. However, the result for delayed reconstruction included the time whilst awaiting surgery, reported as 23 days on average. Von et al concluded that acute ACLR reduced indirect costs to society and patients with regards sick leave and lost wages [6].

The return to sport following ACL injuries is discussed by Ardern et al. [7] in a systematic review and meta-analysis of articles from April 2010 to November 2013. They found that 81% of 4837 participants were able to return to some form of sport, 65% of 2663 participants were able to return to the same pre injury level and 55% of 1330 individuals were able to return to playing their competitive level of sport [7]. These results were similarly matched to an earlier study, which demonstrated an 82% return to some level of sport, 63% return to pre injury level and 44% returning to competitive sport. It was found that factors outside of simply operative success affected the return to sport rates, for example fear of reinjury was cited as the most common reason for failure to return to sport by participants [8].

There are significant numbers of functional scoring systems used to assess outcomes following operative management on the knee. It is becoming more common to use patient rather than clinician assessments to gauge patient satisfaction [9]. With over 50 different scoring systems available it can be difficult to select appropriately. Johnson and Smith highlighted that few of these have been properly validated. However, they suggested Lysholm II knee scoring scale and Tegner activity score should be used in the follow up of patients, with International Knee Documentation Committee (IKDC) being preferable to Knee injury and osteoarthritis outcome score (KOOS) [10].

This study sets itself apart by assessing the perceived financial impact to the patient of ACL injury whilst additionally evaluating the length of sick leave required and the return to sporting activity.

Methods

A retrospective case report of 92 patients who had ACLR performed by Orthopaedic Surgeons working at Salford Royal Hospital between September 2014 and December 2022. Operative techniques included bone-patella tendon-bone graft, hamstring graft and quadriceps graft. The primary outcome was the socioeconomic impact of ACL injury, with secondary outcomes including, mean time off work, sick leave taken and return to sport.

A total of 279 patients were identified from operation coding searches. Initially each patient was contacted via letter with the study questionnaire (appendix 1). There were very limited responses to this, therefore patients were contacted via telephone, with a maximum of 3 attempts, and the questionnaire was asked verbally. A total of 92 patients are included in the final data collection. The remainder did not wish to answer the questionnaire, were unable to be contacted or had incorrect contact information on the hospital system.

The questionnaire focused on two main topics. Firstly, the impact on work and finances, including time off work, whether this was taken as paid or sick leave, the financial losses incurred due to time off work and if any personal costs associated with their injury were incurred, such as additional equipment or physiotherapy not provided by the NHS. Secondly, sport and exercise ability, including; pre injury main form of exercise, the level to which they participated pre injury, length of time taken off after injury, if they were able to return to sport and if so, to what level. A final question was asked to determine if patients had any current issues following reconstruction.

The results were collected anonymously using an excel datasheet and analysed to produce the results as below. Pearson correlation was used to analyse the impact of age and time from injury to surgery on four of the outcomes; length of time off work, financial losses from work, further personal costs and time to return to sport.

Results

Of the 92 individuals 63 were male and 29 were female. Average age at operation was 29.9 years (range 16-63). 62 reported full time jobs, 10 were self-employed, 12 were students, 7 were unemployed and 1 participant had retired at the time of injury. The most commonly played sport was football (n=45), followed by running (n=14) and gym users (n=9). 4 patients stated they did no regular exercise. 67 patients played their sport as a hobby or at an amateur level, 4 were professional, 9 semi-professional, 3 were playing at a regional level and 5 were playing at school or university.

Average time out of work was 9 weeks (range 0-52), with 48% taking sick leave during this period off work. Following their ACL injury and reconstruction 30 patients reported financial losses from work, at an average of £3581 (£300-£10,000). Furthermore, 28 patients reported additional personal costs following injury at an average of £796

Gamble C, et al., J Ortho Sports Med 2024
DOI:10.26502/josm.511500154

(£100-£3500). These costs were commonly for alternative travel arrangements to and from work and appointments, additional equipment required at home and additional private physiotherapy that was not provided as part of their NHS treatment.

Following ACLR the average time to return to sport was 56.7 weeks (8-208). 4 participants played no regular sport. Of the remaining 88, only 22 participants (25%) were able to return at the same level post injury. 40 participants (45%) reported a reduced level of sporting ability, 9 (10%) participants stated they had to change sport and 9 (10%) were unable to return to any sport. Furthermore, patients were asked about current ongoing issues during the questionnaire. The most common themes were pain on exercise (n=14), general pain (n=18), feeling of instability (n=12), giving way (n=7) and crepitus (n=7).

Pearson correlation analysis found a statistically significant strong positive correlation between time from injury to surgery and financial losses reported, r(9) = .608, p = .047 (Figure 1). A small negative correlation was found between age and time out of work, with a near significant p value, r(69) = .021, p=.093, and can be seen in Figure 2. Further Pearson correlation analysis did not produce any statistically significant results.

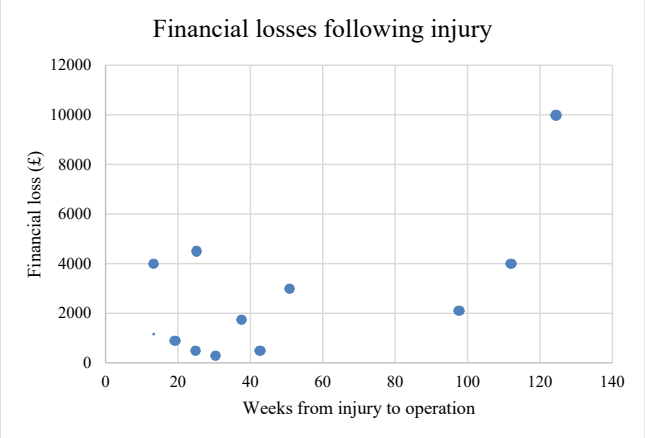


Figure 1: Scatter graph comparing weeks from injury to operation with financial losses, demonstrating a significant positive correlation.

Figure 2: Scatter graph comparing age with time out of work in weeks, demonstrating a small negative, non-significant correlation.

Discussion

These results demonstrate the extensive impact that an ACL injury has on patients. Time away from work, averaging 63 days in this study further supports the findings by Arimaa et al. [5] and Von et al. [6]. Additionally, ability to return to sport was similar to that reported by Arden et al. [8] with 90% in comparison to 82% returning to some form of sport following ACLR [8]. Pearson correlation analysis demonstrated a significant relationship between longer time from injury to operation and increased financial losses for the patient. In this analysis 11 participants were included, those who were unable to report their date of injury and financial losses incurred were removed from this analysis. These results would suggest that earlier surgical intervention is likely to benefit patients from a socioeconomic viewpoint. Interestingly, a recent meta-analysis including over 2000 patients found no significant difference between acute and delayed reconstruction with regards functional outcome, range of movement deficits, weakness, failure and reoperation rates, complications, stiffness, muscle strength and laxity [11]. This would suggest further, larger study analysis should be completed to analyse the financial impact on patients and whether this may advocate for earlier repair in certain patient groups.

This paper highlights the financial cost of the injury to the patient themselves, not just physical recovery and length of time away from sport and exercise. It is clear from time off work, sick leave, financial losses and additional costs associated with the injury that the impact of ACL injury is far greater than simply physical. Importantly, in 3 cases the injury ended the individuals career, forcing a career change.

This study does have certain limitations. Firstly, by nature of a retrospective questionnaire there may be inaccuracies in the recall by the included patients. A potentially protracted period of time from injury to answering the questionnaire further impacts this. Secondly, the answers to the questionnaire itself are subjective to the patients perspective on their recovery, this increases the risk of bias dependent on their post-operative experience. For future similar studies objective scoring tools could be used in addition to assess the recovery.

Conclusion

This study can be utilised to provide further information to patients regarding the recovery period following ACLR. On average, patients required 9 weeks of sick leave, with

Gamble C, et al., J Ortho Sports Med 2024
DOI:10.26502/josm.511500154

42% reporting financial losses from their occupation at an average in excess of £3500. Furthermore, the average time taken away from primary sport or form of exercise was over a year, at 56.7 weeks, with only 25% of participants returning at their pre injury level.

Compliance with Ethical Standards:

This case report utilised voluntary questionnaires to collect anonymous data. There was no formal intervention requiring ethical approval. All participants, when contacted, were explained the purpose of the project and gave verbal consent to participate prior to answering the questionnaire. There is no potential harm to participants and full anonymity is guaranteed.

The authors have no relevant financial or non-financial interests to disclose.

References

1. Abram SGF, Price AJ, Judge A, et al. Anterior cruciate ligament (ACL) reconstruction and meniscal repair rates have both increased in the past 20 years in England: hospital statistics from 1997 to 2017. Br J Sports Med 54 (2020): 286-291.
2. Sanders TL, Maradit Kremers H, Bryan AJ, et al. Incidence of Anterior Cruciate Ligament Tears and Reconstruction: A 21-Year Population-Based Study. Am J Sports Med 44 (2016): 1502-7.
3. Mather RC 3rd, Hettrich CM, Dunn WR, et al. Cost-Effectiveness Analysis of Early Reconstruction Versus Rehabilitation and Delayed Reconstruction for Anterior Cruciate Ligament Tears. Am J Sports Med 42 (2014): 1583-91.
4. Mather RC 3rd, Koenig L, Kocher MS, et al. Societal and economic impact of anterior cruciate ligament tears. J Bone Joint Surg Am 95 (2013): 1751-9.
5. Arimaa A, Knifsund J, Keskinen H, et al. Return to work following anterior cruciate ligament reconstruction. Acta Orthop 93 (2022): 554-559.
6. Von EC, McCallum S, Barenius Björn, et al. Acute reconstruction results in less sick-leave days and as such fewer indirect costs to the individual and society compared to delayed reconstruction for ACL injuries. *Knee Surgery, Sports Traumatology, Arthroscopy 28* (2020): 2044-2052.
7. Ardern CL, Taylor NF, Feller JA, et al. Fifty-five per cent return to competitive sport following anterior cruciate ligament reconstruction surgery: an updated systematic review and meta-analysis including aspects of physical functioning and contextual factors. Br J Sports Med 48 (2014): 1543-52.
8. Ardern CL, Webster KE, Taylor NF, et al. Return to sport following anterior cruciate ligament reconstruction surgery: a systematic review and meta-analysis of the state of play. Br J Sports Med 45 (2011): 596-606.
9. Wright Rick W. Knee Injury Outcomes Measures. Journal of the American Academy of Orthopaedic Surgeons 17 (2009): 31-39.
10. Johnson DS, Smith RB. Outcome measurement in the ACL deficient knee--what's the score? Knee 8 (2001): 51-7.
11. Vermeijden HD, Yang XA, Rademakers MV, et al. Early and Delayed Surgery for Isolated ACL and Multiligamentous Knee Injuries Have Equivalent Results: A Systematic Review and Meta-analysis. Am J Sports Med 51 (2023): 1106-1116.