Clinical and Cost Effectiveness of Pre-Operative Physiotherapy for Patients with Anterior Cruciate Ligament Injury Undergoing Reconstruction in Riyadh, Saudi Arabia

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Introduction

Anterior cruciate ligament (ACL) injury is associated with pain, muscle weakness, functional impairment, poor quality of life (QoL), and financial burden[1].

Pre-operative physiotherapy is used to restore knee function and improve QoL in patients undergoing ACL reconstruction[2].

The clinical and cost effectiveness of pre-operative physiotherapy for the management of patients with ACL injury in not known in Saudi Arabia.

Purpose

To examine the clinical and cost effectiveness of a pre-operative physiotherapy programme for the management of Saudi patients with ACL injury.

Participants

Recruited from 3 hospitals in Riyadh.

Inclusion: males; 18-50 years; isolated ACL injury; not undergone reconstruction surgery.

Exclusion: associated fractures, meniscal tears, collateral ligament injury, concomitant morbidity contra-indicating physical exercise.

Methods

Design: Pragmatic randomised controlled trial (RCT)

Control group: no pre-operative physiotherapy

Intervention group: standardised pre-operative rehabilitation programme[2]

Power calculation based on primary outcome (KOOS) = 36 per group

Results

Control: n = 45; age: 27.5 (IQR 8)

Intervention: n = 39; age 27 (IQR 8.5)

Table 1: Post-reconstruction (14 days) KOOS scores for Control and Intervention groups

Primary outcome measures (KOOS) [a]	Control (n = 45)		Intervention (n = 39)		Difference
	Median	IQR [b]	Median	IQR [b]	p value
Pain	64	7	71	3	< 0.001***
Symptoms	64	8	69	4	< 0.001***
Function in activities of daily living (ADL)	85	13	93	8	0.001***
Function in sports and recreation	15	5	15	0	0.117
Knee-related quality of life (QoL)	19	12	25	6	0.002**
Global KOOS score	49.4	8.6	55.2	4.5	< 0.001***

[a] KOOS score is reported from 0 to 100, with higher scores indicating better outcomes

[b] IRQ, inter-quartile range

** indicates *p* values lower than 0.01, *** indicates *p* values lower than 0.001

Results

Patients in the intervention group showed significant improvement in the primary outcomes compared to the control group as demonstrated by the KOOS scores ($p < 0.001$).

Table 2: Resource use in the Control and Intervention groups

Resource use	Median		Difference p value
	Control (n = 45)	Intervention (n = 39)	
Physiotherapy	-	1512 SR (£252)	-
Medical consultation	300 SR (£50)	150 SR (£25)	< 0.001***
Imaging	1800 SR (£300)	1800 SR (£300)	0.756
Medications	358.90 SR (£59.82)	339.35 SR (£56.56)	<0.001***
Inpatient	2100 SR (£350)	1500 SR (£250)	< 0.001***
Inactive days (loss of productivity)	391.29 SR (£65.22)	324.43 SR (£54.07)	0.447
Total costs	4750.19 SR (£791.70)	5481.78 SR (£913.63)	< 0.001***

The measured incremental cost-effectiveness ratio (ICER) indicated that the intervention can be deemed to be cost-effective (£1150 per QALY gained).

Table 3: ICER between treatments

	Control (n = 45)	Intervention (n = 39)
Total costs	4750.19 SR (£791.70)	5481.78 SR (£913.63)
QALY score	0.573	0.679
ICER	6901.79 SR (£1150.30) / QALY	

Discussion & Conclusions

The clinical and cost-effectiveness of the intervention indicated by the present clinical trial suggest that pre-operative physiotherapy is beneficial for the management of ACL-deficient patients

Recommendations

Pre-operative physiotherapy should be introduced to healthcare management of ACL injury in KSA.

References

[1]Frobell et al. (2013) 'Treatment for acute anterior cruciate ligament tear: five year outcome of randomised trial.' *British Medical Journal,* 346, f232

[2]Alshewaier et al. (2016) The Effectiveness of Pre-operative Exercise Physiotherapy Rehabilitation on the Outcomes of Treatment Following Anterior Cruciate Ligament Injury: A Systematic Review. *Clinical Rehabilitation*. Vol. 31(1) 34–44

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Ethical approval

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