

Enhanced biomechanical closed kinetic chain therapy intervention in the rehabilitation of patients after Total Hip Arthroplasty

Yaari L., Kosashvili Y., Segal G., Baruch Y., Velkes S.,
Mor A., Debi R., Bernfeld B., Elbaz A.

Presenter: Baruch Y.
Orthopedic Department
Rabin Medical Center
Petah-Tikva



Introduction

90% **survivorship** 10 years following THA

Reduced **pain**, better **function** than pre-operative state



Introduction

However:

- Pain level & quality of life - **less than general population**
- **25% unable to return** to pre-operative sports
- **Limp**, periarticular discomfort

Complaints may be attributed to **muscle weakness**

Introduction

- Muscle weakness → motor function deficit → impairments in daily living activities
- Major goal in THA rehabilitation - muscle strengthening and coordination
- No evidence-based guideline for rehabilitation is available

Study Objectives

Effect of closed kinetic chain (CKC) exercise on gait parameters and clinical measures following THA

Materials and Methods

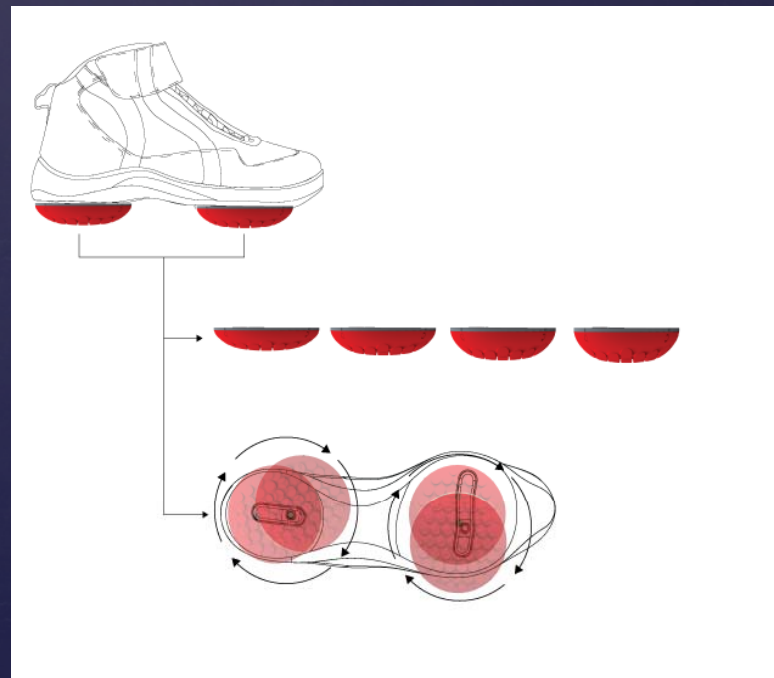
- **Prospective analysis**
 - Primary OA
 - 3 months Post THA
- **Exclusion criteria**
 - Infection
 - Instability / loosening
 - Previous Hip Surgeries
 - Other Arthroplasties

Materials and Methods

- Patients underwent a computerized spatio-temporal **gait test** at three time points:
 - **Pre-treatment**
 - **Post 15 min**
 - **Post 3 months**
- **WOMAC and SF-36** questionnaires before and after 3 months of treatment

Treatment

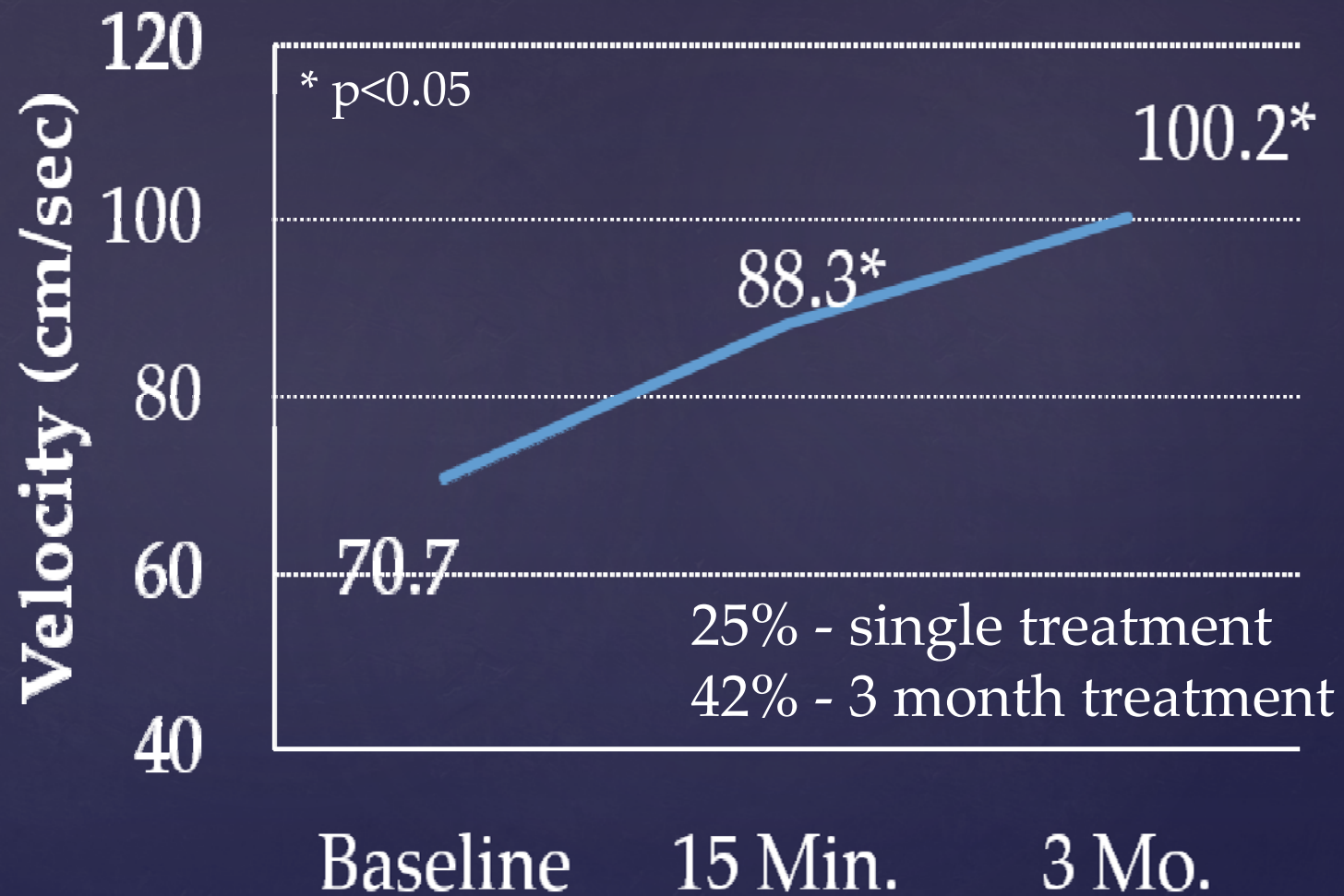
- The Closed Kinematic Chain enhancer
 - Biomechanical device
 - **Modular elements** attached to foot-worn platforms

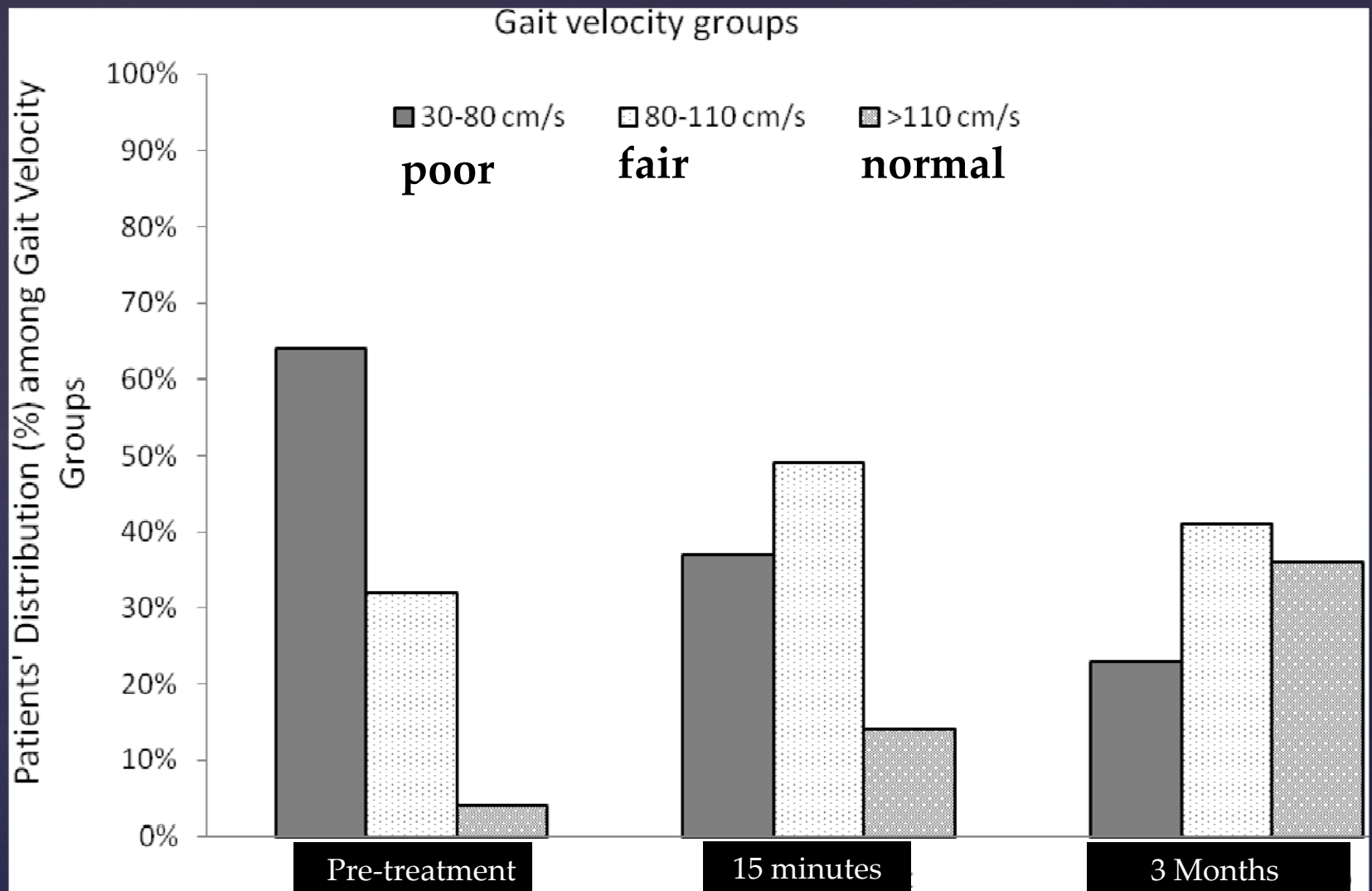


Study Design

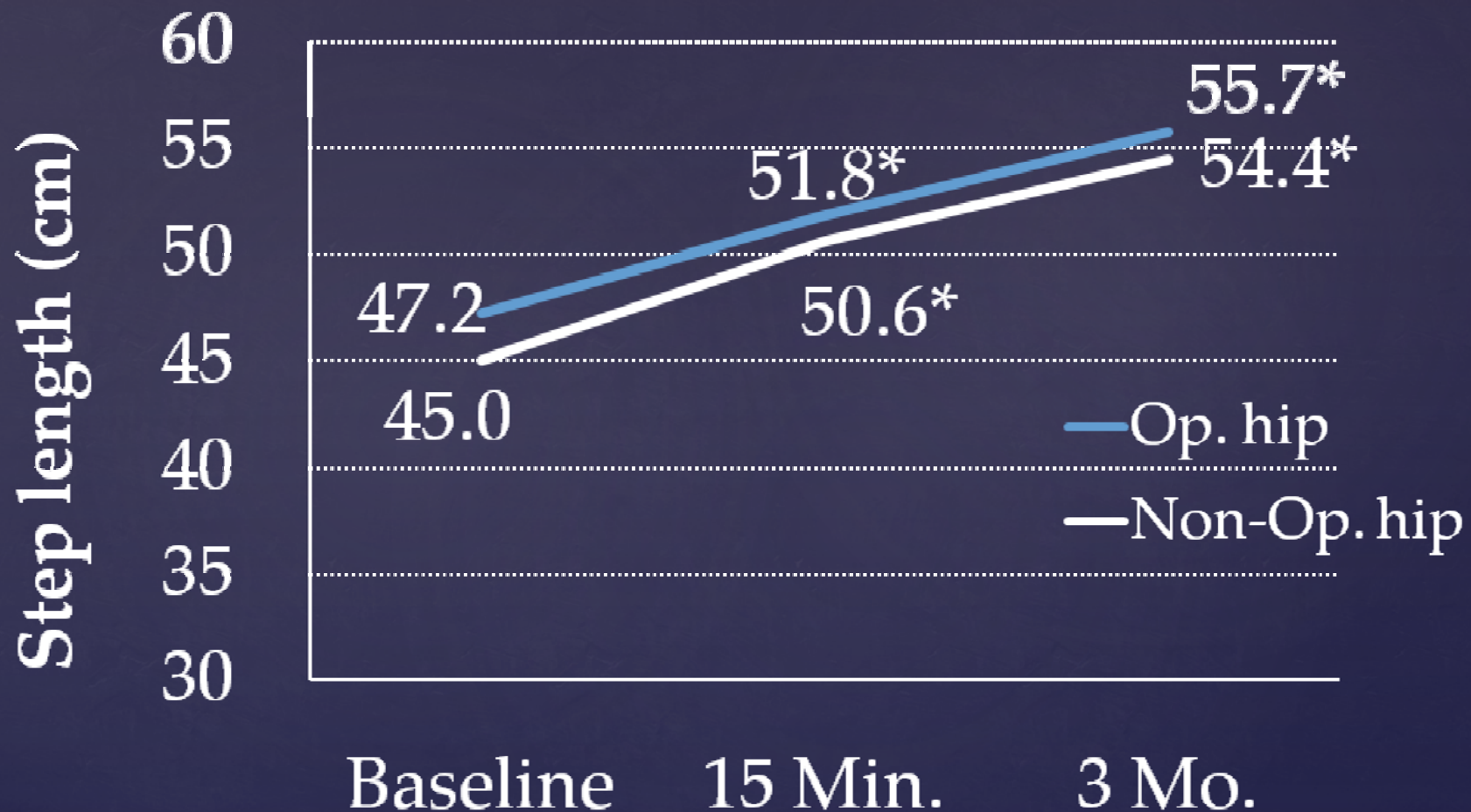
- 35 patients,
- 21F : 14M (60%/40%)
- Mean age: 65.3 y , Range: 50y - 84y
- BMI: 27.7

Velocity



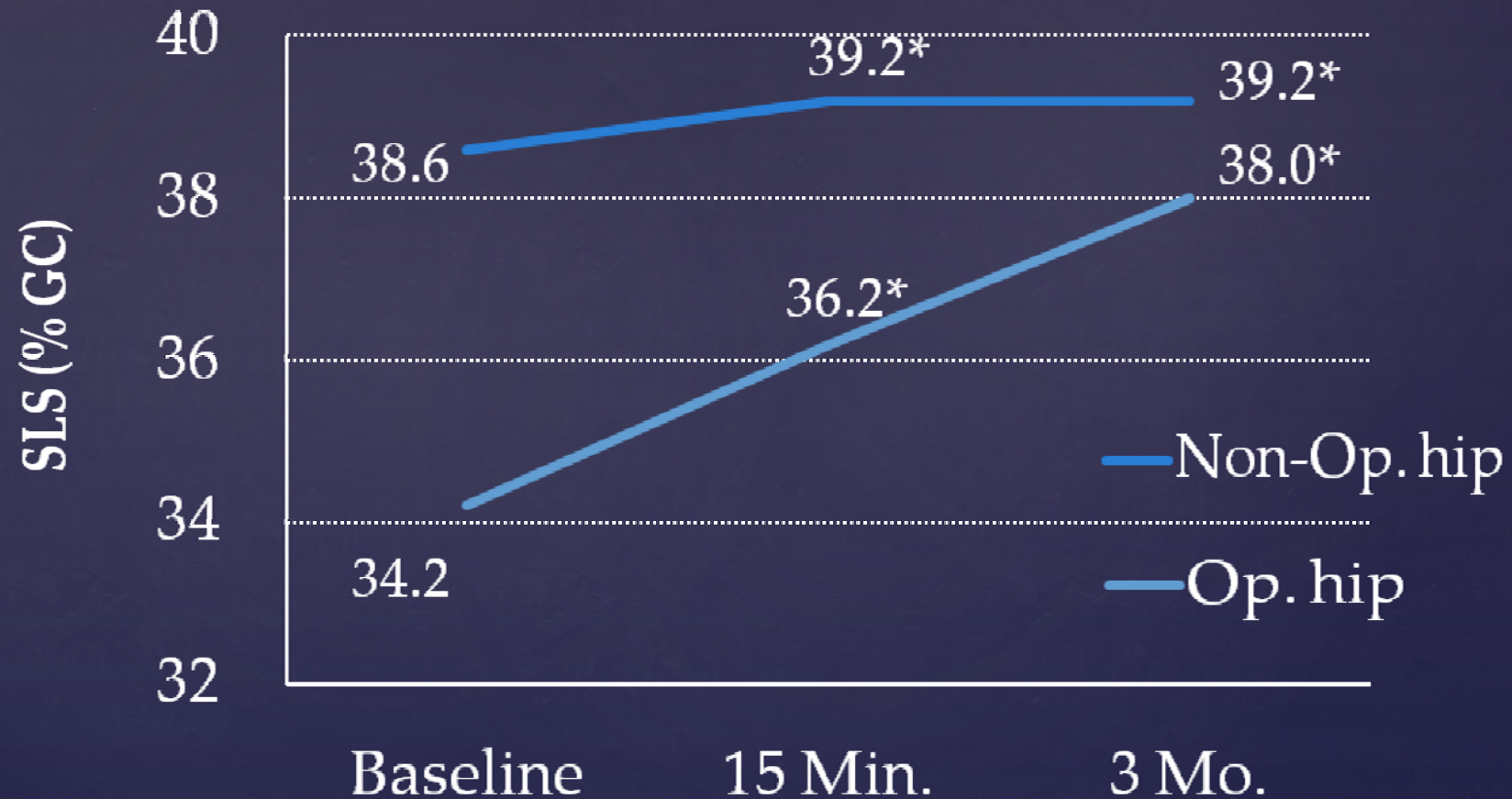


Step Length



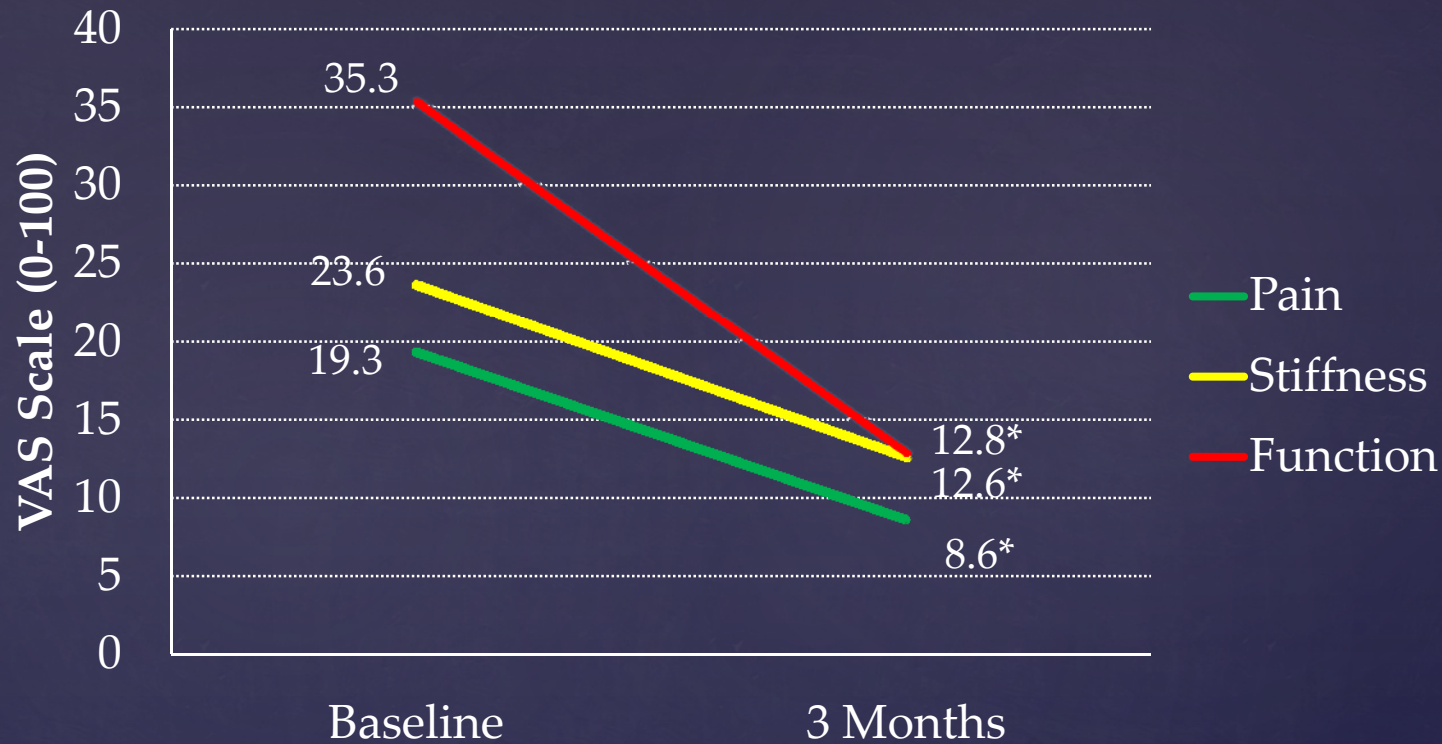
* p<0.05

Single limb support



* p<0.05

WOMAC Scores



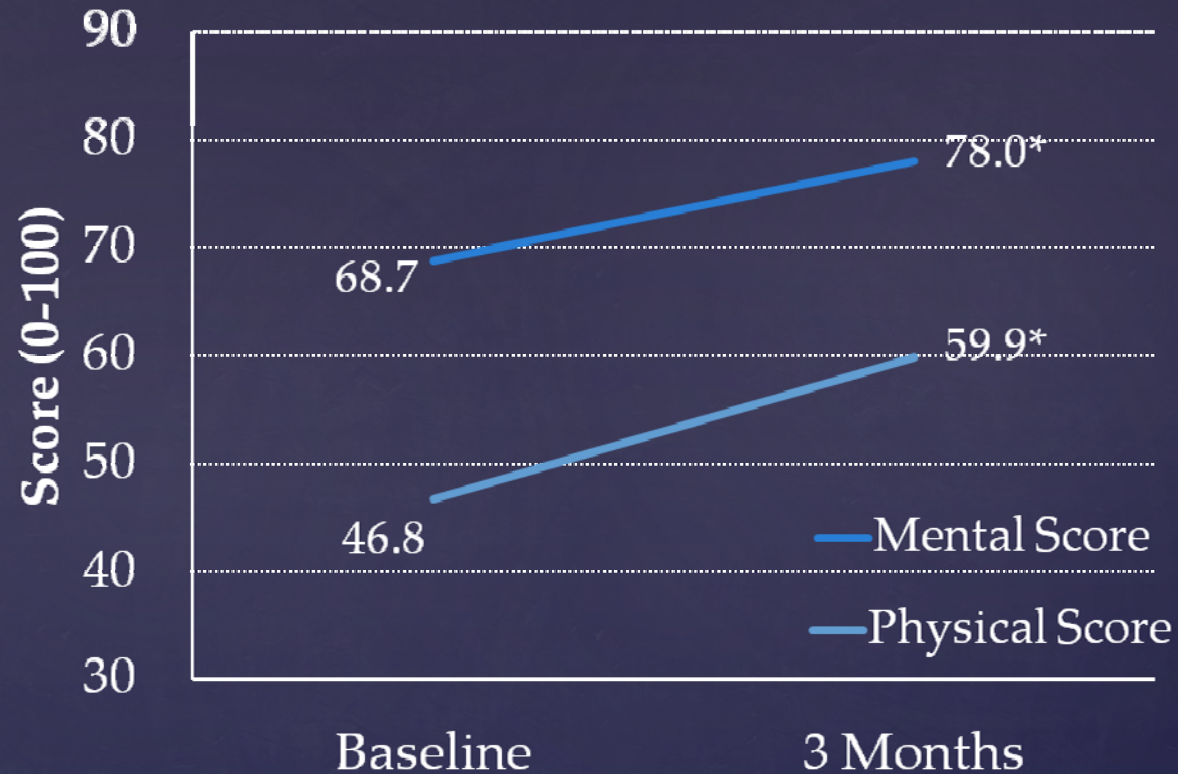
55% decrease in **pain**

47% decrease in **stiffness**

64% decrease in **functional limitation**

* p<0.05

SF-36



28% increase in **Physical Score**
14% increase in **Mental Score**

* p<0.05

Study Limitations

- Small Cohort
- No control group
- Data from a single center

Discussion

↑ Gait patterns after one session
□ Enhanced following 3 months of therapy

↓ Pain

↑ Function

↑ QoL

Conclusions

Overall functional improvement after CKC therapy

- Subjective (SF-36/WOMAC)
- Objective (Gait parameters)

CKC therapy may be valuable in rehabilitation
after THA