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Research Article
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BFpress Method: Pilot Evaluation of Muscle Compression Resistance Index (MCRI) at the 33rd Athens Physiotherapy Conference

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Abstract

This pilot study aimed to evaluate muscle resistance using a novel device (BFpress) and a newly proposed index, the Muscle Compression Resistance Index (MCRI). Data were collected from 95 participants during the 33rd Scientific Physiotherapy Conference in Athens (2026). Measurements were performed bilaterally at the L4–L5 paraspinal level.

Participants were categorized based on MCRI values: <25 kg, 25–35 kg, and >35 kg. The majority (61%) demonstrated increased muscle resistance (<25 kg). Female participants showed approximately 20% lower values compared to males, suggesting higher resistance. Repeatability testing in a subgroup (n=15) revealed improvement (15–20%) in asymptomatic individuals, while symptomatic participants showed minimal change.

These preliminary findings suggest that MCRI may provide an objective and clinically relevant measure of muscle resistance, with potential diagnostic value.

Keywords: Muscle Resistance; Physiotherapy; MCRI; BFpress; Lumbar Spine; Muscle Stiffness

Introduction

Accurate assessment of muscle resistance remains largely subjective in physiotherapy, relying on palpation and clinician experience.

The BFpress method introduces a standardized mechanical compression technique combined with a quantitative index (MCRI), enabling objective evaluation of muscle response.

This study presents real-world pilot data collected during a large scientific conference.

Methods

A total of 95 participants were evaluated voluntarily.

Data collected:

Age.

Gender.

Professional status.

Musculoskeletal dysfunction (last 12 months).

Measurement protocol:

2 Compressions right side.

2 Compressions left side.

Lumbar level L4–L5.

Average MCRI recorded.

Sample:

60 Males.

35 Females.

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15 Participants (16%) with musculoskeletal complaints.

Repeatability subgroup:

15 Participants re-tested after 1–2 days.

Results

MCRI Distribution

58 Participants: 17–25 kg.

22 Participants: 26–30 kg.

15 Participants: >31 kg.

See Figure 1.

Distribution of Muscle Compression Resistance Index (MCRI) values measured at the lumbar level (L4–L5) in 95 participants during the 33rd Scientific Physiotherapy Conference (Athens, 2026).

Gender Differences

Female participants showed approximately 20% lower MCRI values, indicating relatively higher muscle resistance.

Repeatability Findings

10 Participants (healthy): +15–20% improvement.

5 Participants: stable values.

4/5 had musculoskeletal dysfunction.

- Healthy muscle = adaptability.
- Dysfunctional muscle = reduced elasticity.

MCRI Definition and Clinical Interpretation

The Muscle Compression Resistance Index (MCRI) is defined as:

The maximum applied pressure (kg) that muscle tissue can tolerate before activating mechanical resistance.

See Figure 2.

Discussion

The findings suggest that the BFpress method provides an objective and reproducible assessment of muscle resistance.

The high percentage of participants in the lower MCRI range indicates a tendency toward increased muscle stiffness even in a mixed population.

Repeatability data suggest that:

Healthy tissue adapts.

Dysfunctional tissue remains resistant.

Clinical Implications

MCRI may serve as a quantitative clinical tool to complement traditional palpation.

Limitations

Sample size.

Conference-based population.

Lack of imaging correlation.

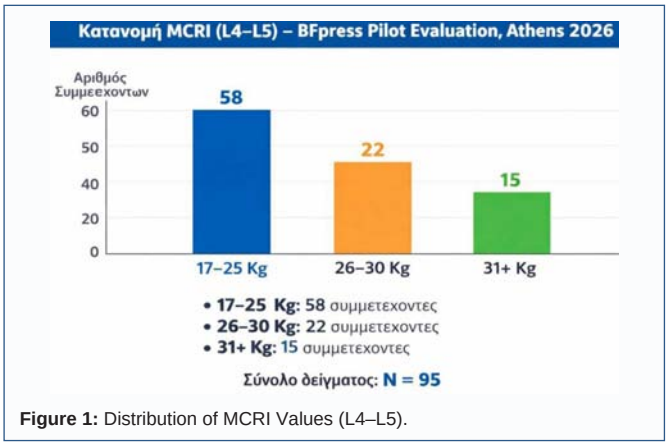

Figure 1: Distribution of MCRI Values (L4–L5).

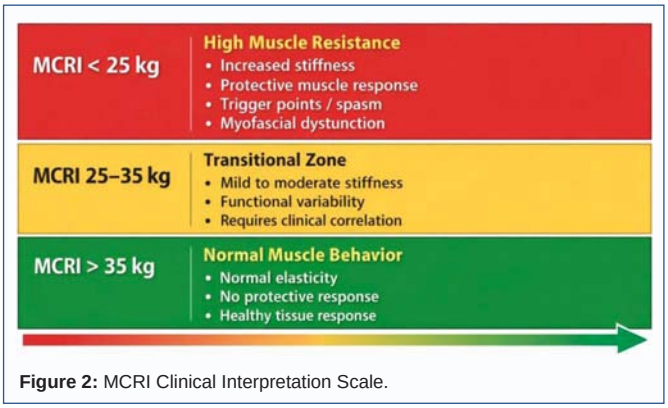

Figure 2: MCRI Clinical Interpretation Scale.

Future Research

Further studies should:

Validate MCRI in larger populations.

Correlate with imaging & EMG.

Define normative values.

Conclusion

The BFpress method combined with the MCRI offers a novel, objective, and clinically applicable tool for assessing muscle resistance.

This pilot study supports its potential use in both clinical and research environments.

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