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The Relationship Between Decreased Ankle Range of Motion and Dysfunction of the Muscle-Venous Pump of The Lower Leg In Patients With Lymphedema of the Lower Extremities

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Research Objectives

To determine the relationship between Ankle Range of Motion (AROM) and dysfunction of the muscle-venous pump (MVP) in patients with lower limb lymphedema.

Design

In pilot project included 10 patients with lymphedema of the lower extremities (LLL) I-III stages. Patients underwent goniometry (AROM dorsiflexion) and isokinetic dynamometry (IKDM) of the muscles of the lower extremities. The limbs of 10 healthy volunteers were tested.

Setting

The study was carried out at Clinic of National Medical Research Center for Rehabilitation and Balneology of the Ministry of Health of Russia, which provides specialized inpatient and polyclinic medical care.

Participants

10 patients with stage I-III of LLL, average age - 62.0 years and 10 healthy volunteers, average age - 27.0 years.

Interventions

Each participant performed 10 repetitions of flexion / extension of the lower limb at a slow (0.1 m / s) extension speed. AROM (dorsiflexion) were measureed using a goniometer in degrees. IKDM were tested on the Leg Press Module of Robotic Biomechanical Complex with biofeedback. The significant power parameters were prospectively analyzed: maximum limb extension force, average limb extension force, total work.

Main Outcome Measures

In patients with LLL a decrease in AROM dorsiflexion by 30% and AROM plantar flexion by 20.2% were determined. Testing on the Leg Press module in patients with lymphedema revealed a decrease IKDM indicators: maximum extension force by 26.5%, average extension force by 35.7%, total work by 29.8%.

Results

A decrease in AROM of dorsiflexion in patients with lymphedema indicates a functional limitation of movements in the ankle joint, limiting the full function of MVP.

Conclusions

The revealed decrease in AROM in patients with LLL contributes to the development of dysfunction of the MVP, which manifests in a decrease of muscle strength and overall performance according to the results of testing using isokinetic dynamometry.

Author(s) Disclosures

No conflict of interest.

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Key Words

Lymphedema; Range Of Motion; Ankle Joint Muscle-Venous Pump Of The Lower Leg; Isokinetic Dynamometry

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