ISAKOS CONGRESS 2025 | MUNICH GERMANY June 8–11

Clínica Santa Sofía
Grupo Médico Vargas C.A. Rif: J-00068377-8

Blood Flow Restriction-Enhanced Platelet-Rich Plasma: Preliminary Results of a Pilot Randomized Controlled Trial

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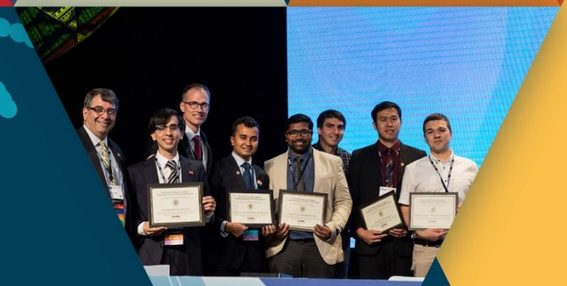

ACKNOWLEDGMENT

Aided by a Grant from the International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine and the Orthopaedic Research and Education Foundation.

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FACULTY DISCLOSURE INFORMATION

Theodorakys Marín Fermín, MD.

- Member of the Editorial Board of International Orthopaedics and the Journal of Experimental Orthopaedics (JEO).
- Member of the Registry Steering Committee and Patient Registry Manager for the International Cartilage Regeneration & Joint Preservation Society (ICRS).
- Member of the Communications Committee and Biologics Task Force in the International Society of Arthroscopy, Knee Surgery, and Orthopaedic Sports Medicine (ISAKOS).

The other co-authors have nothing to disclose.

OBJECTIVES

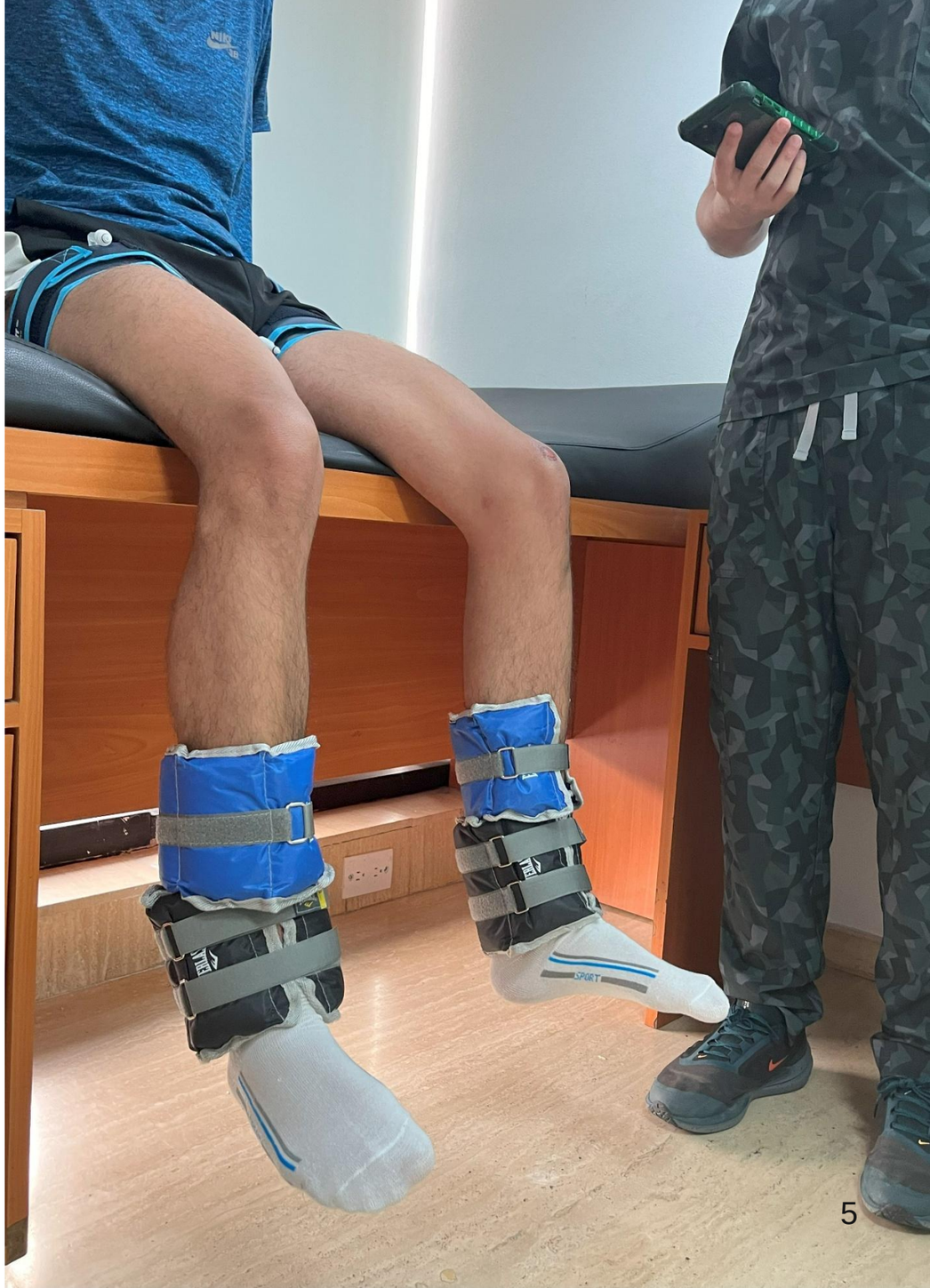
- To assess changes in platelet and leukocyte counts, insulin-like growth factor 1 (IGF-1), and interleukin 6 (IL-6) concentrations after low-load bilateral knee extensions under blood-flow restriction (BFR) in platelet-rich plasma (PRP).

METHODS

- A randomized controlled trial was conducted from June 2024 to the present, involving two groups: the intervention group, which underwent bilateral knee extensions with BFR, and the control group, which performed bilateral knee extensions without BFR.
- Participants were randomly allocated in a 1:1 ratio. Healthy male individuals aged 18-40 years with a Tegner activity scale (TAS) score of 5 or higher and no musculoskeletal conditions that interfered with exercise were enrolled.
- Exclusion criteria included systemic inflammatory diseases, cardiovascular risk factors, blood dyscrasia, TAS < 5, use of non-steroidal anti-inflammatory drugs or aspirin within one week before testing, or prior exercise on the testing day.

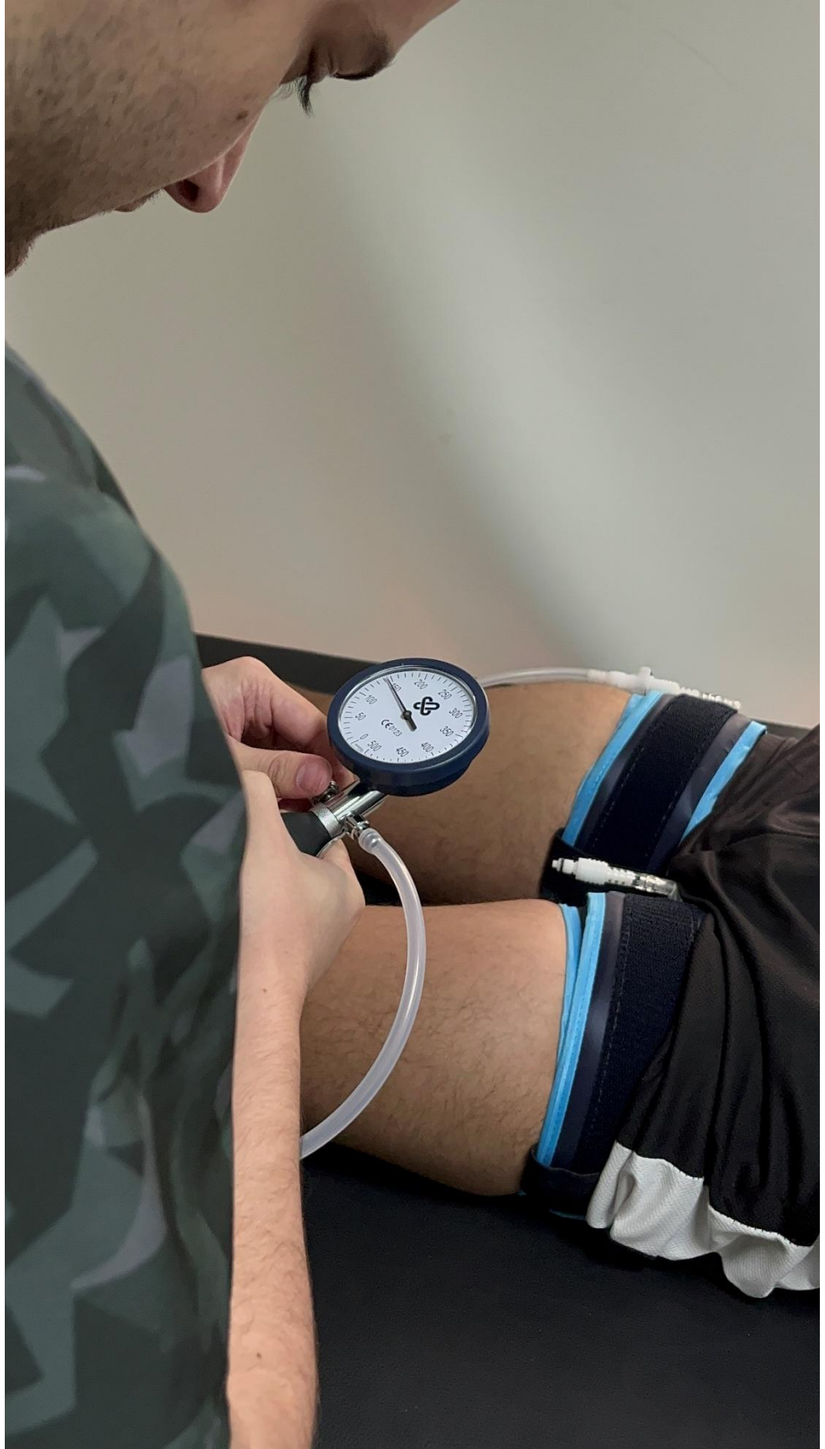
METHODS

- Participants performed low-load bilateral knee extensions under BFR following a standard protocol of 30-15-15-15 repetitions with 30-second rest intervals at 80% limb occlusive pressure and 15 lbs. PRP platelet and leukocyte counts, IGF-1, and IL-6 concentrations were measured before exercise and at 10, 20, and 30 minutes post-intervention.



METHODS

- Participants' data were summarized using means and standard deviations, as well as frequencies and percentages. The Shapiro-Wilk test was used to assess the distribution of numerical variables. The repeated-measures analysis of variance (ANOVA) test was used for normally distributed variables, and the Friedman test was used for non-normally distributed variables. A p-value < 0.05 was considered statistically significant.



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RESULTS

- Eleven out of the planned 22 participants were enrolled, with six in the intervention group and five in the control group. The mean age was 25 ± 5 years, body mass index was 24 ± 2.8 kg/m^2, and TAS was 6 ± 1 points.
- Platelet concentration in the intervention group peaked 10 minutes post-exercise and remained elevated for up to 30 minutes, compared to the control group ($p = 0.45$).
- IGF-1 concentration in the intervention group was lower than in the control group throughout the testing period ($p = 0.55$). There were no significant differences between the intervention and control groups in PRP platelet and leukocyte counts, IGF-1, and IL-6 concentrations.

CONCLUSIONS

- Low-load bilateral knee extensions under BFR may increase platelet concentration while decreasing IGF-1 levels in PRP. However, these preliminary results are not statistically significant.

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