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[1]

Running is, maybe, the most ancient physical activity. Nevertheless, it has been on the spot in the last years, and actually is a trending exercise around the world. Running is a whole body activity that stresses our systems both in metabolic and mechanistic way. is stress, repeated continuously, could lead into an overuse injury in muscle, tendon or even bone, being running one of the sports in which overuse injuries develop more frequently, in around 59.4% of the cases [1]. As Videbæk [2] found in their study, the incidence of injury is higher in beginners than in recreational runners, which could be explain, at least partially, in the adaptations reached along their physical training period.

Di erent exercises have been proposed to prevent all these overuse injuries related to running, being eccentric overload training one of the most accepted in the last years because its ability to improve the state of tendons without a great metabolic impact. Eccentric overload means that the eccentric phase of the movement is performed with higher loads and velocity than the concentric. For example, squat movement combined with eccentric is the “gold standard” for the patellar tendon, and it is commonly used to cause bene cial changes in the tissues. e protocol most widely used [3-5] consists in 12–15 weeks of treatment for patellar tendinosis injuries [6]. For the Achilles tendon, a number of studies have used eccentric overload to improve the state of tendon and muscle in reduced time [7,8] ese (patellar and Achilles) are the tendons that support more loads during running, and we must take this in account when we plan speci c training or therapy for runners, even more if they are beginners.

During running, not only tendons su er a bigger stress. Muscles are contracting both in concentric, isometric and eccentric manner, with more implications of each one depending on the terrain (uphill or downhill running) [9], so it could be interesting to train muscles to face concentric and eccentric contractions safely.

Di erent exercises produce an eccentric overload, like plyometric, drop jumps or downhill running, but isoinertial devices avoid joint impacts and maybe that is why they are widely used in the last years to increase the eccentric phase [10] having an important work also during the concentric. Tissue adaptations caused by eccentric overload training are apparent, but the increased load of the eccentric training can increase pain and muscle damage markers in subjects under training [11], increasing resting metabolic rate during 72 h [12], so we must take these in account when scheduling training loads.

ese devices have been used in di erent sports like football [13] basketball or volleyball [14], but not yet in running. Our group described muscles and tendon adaptations during 3 consecutive days of running performing a 1-h running session [8,15,16], and how eccentric overload training reduces the risk of injury according to thermogra c and ultrasound parameters.

It can be concluded that eccentric overload training causes particular adaptations in muscle and tendon tissues. is kind of training with eccentric overload suggests less time for adaptation and a more normalised response pattern in these tissues, so it may have bene cial e ects in the prevention of structural tissue changes during running. e changes generated helped tolerate new e ort in healthy participants and it could also be incorporated into a training programme for di erent sports with running as the main activity. is type of training could be developed as a part of a pre-season period in the coaching schedule or during therapy as a treatment of some overuse tendon injuries.

References

1. Ristolainen L, Heinonen A, Turunen H, Mannström H, Waller B, et al. (2010) 7\SH RI VSRUW LV UHODWHG WR LQMXU\ SUR¿OH VZLPPHUV ORQJ GLVWDQFH UXQQHUV DQG VRFFHU VWXG\ 6FDQG - 0HG 6FL 6SRUWV

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