Latin American Journal of Pharmacy
(formerly *Acta Farmacéutica Bonaerense)*
Lat. Am. J. Pharm. **37** (12): 2409-14 (2018)

Received: September 13, 2018
Revised version: September 25, 2018
Accepted: September 27, 2018

Hesperetin Alleviates Inflammation Induced by IL-1β Induced in Rat articular Chondrocytes as Osteoarthritis Model

Jun LIU [1], Zhonghua YANG [1], Dan CAI [2] & Song GUO [1] *

[1] *Department of Orthopedics, Wuhan Fourth Hospital; Puai Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, 430033, China*

[2] *Operating Room, Wuhan Hospital of Traditional Chinese Medicine, Wuhan, 430010, China*

***SUMMARY*. Degeneration of knee joints is known as osteoarthritis (OA). Progression of OA includes inflammation as its primary symptom. Hesperetin is a flavonoid of plant origin and is known to possess anti-inflammatory activity. The effect of hesperetin on rat articular chondrocytes stimulated with IL-1β was studied. The rat chondrocytes were treated interleukin-1b (IL-1β) or with a combination of hesperetin (10, 20, 40 μM) and IL-1β. The levels of inflammatory mediators viz. nitric oxide (NO) and prostaglandin E2 (PGE2) were measured using the Greiss assay and ELISA, respectively. Additionally, the levels of nitric oxide synthase (iNOS) and cyclooxygenase inhibitor 2 (Cox-2) were estimated using western blot densitometry. To determine the mechanism of hesperetin action, the phosphorylated form of NF-κB was estimated using western blot densitometry. Treatment, with hesperetin caused a significant attenuation of pro-inflammatory mediators viz. NO and PGE2, as well as their precursors viz. iNOS and Cox-2. Moreover, it was observed that hesperetin caused a significant reduction in phosphorylated NF-κB and I-κB. Overall the study suggests that hesperetin regulates the expression and activity of pro-inflammatory mediators and thus, can be a promising and safe alternative for arthritis management.**

RESUMEN. La degeneración de las articulaciones de la rodilla se conoce como osteoartritis (OA). La progresión de OA incluye la inflamación como su síntoma principal. Hesperetina es un flavonoide de origen vegetal y se sabe que posee actividad antiinflamatoria. Se estudió el efecto de la hesperetina en condrocitos articulares de rata estimulados con IL-1β. Los condrocitos de rata se trataron con interleucina-1b (IL-1β) o con una combinación de hesperetina (10, 20, 40 μM) e IL-1β. Los niveles de mediadores inflamatorios, a saber el óxido nítrico (NO) y la prostaglandina E2 (PGE2) se midieron usando el ensayo Greiss y el ELISA, respectivamente. Además, los niveles de óxido nítrico sintasa (iNOS) y el inhibidor de la ciclooxigenasa 2 (Cox-2) se estimaron utilizando la densitometría de transferencia Western. Para determinar el mecanismo de la acción de la hesperetina, se estimó la forma fosforilada de NF-αB utilizando la densitometría de Western Blot. El tratamiento con hesperetina causó una atenuación significativa de los mediadores proinflamatorios NO y PGE2, así como sus precursores iNOS y Cox-2. Además, se observó que la hesperetin causó una reducción significativa en NF-αB e I-βB fosforilados. En general, el estudio sugiere que la hesperetina regula la expresión y la actividad de los mediadores proinflamatorios y, por lo tanto, puede ser una alternativa prometedora y segura para el tratamiento de la artritis.

KEY WORDS: flavonoids, inflammation, knee, osteoarthritis.

* Author to whom correspondence should be addressed. *E-mail:* GodekRpra@yahoo.com

ISSN 0326 2383 (printed ed.)
ISSN 2362-3853 (on line ed.)