Perbandingan Efek Anti-inflamasi antara Propolis dan Celecoxib terhadap Tikus dengan Sinovitis Lutut

Hendra Gunawan, Hermawan Nagar Rasyid, Nucki Nursjamsi Hidajat, Agus Hadian Rahim

Department of Orthopaedic and Traumatology, Faculty of Medicine Padjadjaran University/ Hasan Sadikin General Hospital, Bandung, Indonesia

ABSTRAK

Pendahuluan. Sinovitis merupakan proses awal peradangan sendi, ditandai dengan meningkatnya jumlah makrofag pada sinovium yang berperan penting terhadap kerusakan kartilago dan tulang melalui pembentukan fibroblas. Pemberian anti-inflamasi non-steroid (AINS) pada nyeri sendi sering dilakukan, namun efek samping pemberian menimbulkan permasalahan tersendiri di bidang kesehatan. Propolis suatu bahan alami banyak dikonsumsi sebagai penghilang nyeri sendi lutut, mengandung bioflavonoid dan *Caffeic Acid Polyphenol Ester*. Beberapa penelitian membuktikan efek propolis sebagai anti-inflamasi, namun mekanisme kerjanya dalam menekan jumlah makrofag dibandingkan dengan anti inflamasi lain belum pernah diteliti. Dengan demikian, penelitian ini bertujuan membandingkan efek propolis terhadap celecoxib sebagai anti-inflamasi dalam sinovitis lutut tikus.

Bahan dan cara kerja. Pada penelitian eksperimental ini digunakan tikus jantan galur Wistar yang dibagi menjadi tiga grup. Masing-masing grup diberikan peptidoglikan saja, peptidoglikan dan propolis per oral, serta peptidoglikan dan celecoxib per oral. Skor dari jumlah makrofag dan sinovitis sendi lutut tikus diamati dengan imunohistokimia CD-68 dan pewarnaan hematoksilin-eosin pada hari ke-1, ke-3 dan ke-14. Perbedaan skor masing-masing grup dianalisis dengan ANOVA.

Hasil. Peningkatan jumlah makrofag dan sinovitis untuk semua grup penelitian terjadi pada hari ke-3, selanjutnya menurun pada hari ke-14. Terdapat perbedaan bermakna penghambatan jumlah makrofag antara grup 1 dengan kedua grup lainnya pada hari ke-3 ($p<0.05$). Hal tersebut membuktikan bahwa terdapat peran anti-inflamasi. Pada hari ke-3 dan ke-14, jumlah makrofag grup 2 lebih sedikit dibandingkan dengan grup 3 dengan perbedaan hingga 5 kali lipat ($p<0.05$).

Kesimpulan. Propolis menghambat jumlah makrofag 4-5 kali lebih kuat dibandingkan dengan celecoxib pada synovitis sendi lutut.

Kata kunci: propolis, celecoxib, makrofag, sinovitis

Corresponding author:
Hendra Gunawan, MD
Jl. Lebak Indah IV No. 15 Lebak Bulus Jakarta 12440
Phone : 081320261976
Email : hendrag_md@yahoo.com

Comparison between Propolis and Celecoxib as Anti-inflammatory Agent in Rat with Knee Synovitis

ABSTRACT

Introduction. Synovitis is an inflammation occurs in a joint marked by an increase in macrophage numbers in synovium resulting in cartilago and bone destruction by production of fibroblasts. Administration of non-steroid anti inflammation drug (NSAID) in management of arthritis and synovitis has its own complications, including gastrointestinal and bleeding disorder. Propolis, a natural bee product, is recognized as one of traditional pain killers at knee joint pain containing flavonoid and caffeic acid phenolic esters (CAPE). Several studies show its anti-inflammation effect, but its effect compared to other NSAID is still unknown. Therefore the aim of the study is to compare Propolis and celecoxib anti-inflammation effect in rat with knee joint synovitis.

Materials and Methods. In this experimental study, Wistar strain rats were used. They were divided into three groups. Each group were given peptidoglycan only, peptidoglycan followed by Propolis, and peptidoglycan followed by celecoxib. Scoring based on number of macrophages and synovitis degree were evaluated by immunohistochemistry CD 68 and HE staining. It was evaluated in day 1, 3, and 14. Those scores were collected and analyzed using ANOVA.

Results. Increasing number of macrophages and synovitis degree for all groups occur on day 3 and continuously decreasing until day 14. There is a significant difference in number of macrophages between grup 1 and the other two groups on day 3 ($p<0.05$). It shows that there is an anti-inflammation effect of both propolis and celecoxib. On day 3 and 14, the number of macrophages in grup 2 were five times lower than grup 3. ($p<0.05$)

Conclusions. Propolis anti-inflammation effect shows 4-5 folds stronger than celecoxib in knee joint synovitis.

Keywords: celecoxib, macrophage, propolis, synovitis

Introduction

Arthritis is a term used to describe more than hundred different joint disorders; meanwhile synovitis is an inflammatory process in synovial membrane that follows arthritis.[1] Synovitis still remains as a worldwide health problem regarding complications due to dysfunction of the affected joint as result of progressivity and inadequate treatment. Annual survey in United States in 2008 stated that there are approximately 50 million people diagnosed as arthritis,[2] 744,000 people treated, 9,367 die and 19 million people living with restricted joint mobility.[1]

The principle management of synovitis either conservative or operative is relieving pain, joint resting and immobilization, debridement and surgical synovectomy, besides the causative therapy. Symptomatic therapy to relieve pain using non-steroidal anti-inflammatory drugs (NSAID) has led to health problems due to their side effects, such as gastrointestinal system discomfort and bleeding disorders. The long term duration of using NSAID, even with newest class of selective inhibitor of cyclooxygenase-2 (COX-2) can cause its own complications.

Some of herbal have been proposed as alternative in treatment of joint pain. They provide efficacy and reduce NSAID side effect. One of those substances is Propolis which is derived from bee hive and its saliva. It has been widely consumed as food supplement and is efficacious to relieve joint pain empirically.[7] Its active compound, caffeic acid phenolic esters (CAPE) and flavonoids, has anti-free radical and anti-inflammatory effect.[7] The dose 100 mg/kgBW/day of Propolis for 7 days orally has proven inhibit swelling, granuloma and exudate in rat leg significantly.[10]

There have been many scientific publications about the role of Propolis as a free radical scavenger and anti-inflammatory properties, but its effectiveness in synovitis com-