The Influence of Naproxen on Biological Factors in Leukocyte-Rich Platelet-Rich Plasma- A Prospective Comparative Study AVOID FOR ONE WEEK PRIOR TO PRP

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Purpose

To quantify and compare normative catabolic and anabolic factor concentrations in leukocyte-rich platelet-rich plasma (LR-PRP) at various time points, including baseline, 1 week after initiating naproxen use, and after a 1-week washout period.

Methods

Asymptomatic healthy donors aged between 18 and 70 years were recruited (average age, 36.6 years; range, 25-64 years). Subjects were excluded from the study if they were actively taking any prescribed medications or nonsteroidal anti-inflammatory drugs (NSAIDs) or if they had any of the following at present or previously: blood or immunosuppression disorders, cancer, osteonecrosis, rheumatoid arthritis, avascular necrosis, NSAID intolerance, gastrointestinal or peptic ulcer disease, or kidney dysfunction. The anabolic factors vascular endothelial growth factor, fibroblast growth factor 2, platelet-derived growth factor AB (PDGF-AB), and platelet-derived growth factor AA (PDGF-AA) and the catabolic factors interleukin (IL) 1β, IL-6, IL-8, and tumor necrosis factor α in LR-PRP were measured. Peripheral blood was drawn at 3 time points: baseline, after 1 week of naproxen use, and after a 1-week washout period.

Results

The angiogenic factors PDGF-AA (44% decrease in median) and PDGF-AB (47% decrease) significantly declined from baseline ($P < .05$) after 1 week of naproxen use. There was a significant recovery ($P < .05$) of PDGF-AA (94% increase) and

PDGF-AB (153% increase) levels after the 1-week washout period, with a return to baseline levels. The catabolic factor IL-6 also had a significant decline from baseline (77% decrease in median, $P < .05$) after 1 week of naproxen use. After a 1-week washout period, the IL-6 level was similar to the baseline level (130% increase, $P < .05$).

Conclusions

Naproxen use diminished several biological factors in LR-PRP; however, a 1-week washout period was sufficient for the recovery of PDGF-AA, PDGF-AB, and IL-6 to return to baseline levels. Tumor necrosis factor α, IL-1β, IL-8, vascular endothelial growth factor, and fibroblast growth factor 2 did not show differences between the 3 time points of data collection. Discontinuing NSAIDs for a minimum of 1 week before LR-PRP treatment may improve certain biological factor levels.

Level of Evidence

Level II, prospective comparative study.

Section snippets

Donor Enrollment and Study Design

After institutional review board approval (Vail Health Institutional Review Board, protocol 2017-07), asymptomatic healthy donors aged between 18 and 70 years were recruited through flyers posted in our clinic and hospital; interested applicants were screened and enrolled in the study. Previously established STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines for the design and implementation of cohort or group studies were followed.[18] Subjects were excluded

Donor Demographic Characteristics

A total of 19 healthy volunteers were enrolled in the study. Of these volunteers, 3 had their samples clot and declined participation with a repeated blood draw during the first week of the study. A total of 16 participants (8 women and 8 men), with a mean age of 36.6 years (range, 25-64 years), met the inclusion criteria and voluntarily participated in the study to its completion. The average height of the study participants was 1.74 m (range, 1.52-1.9 m). The average weight was 75.7 kg

Discussion

The most important finding of this study was that after 1 week of naproxen use in healthy donors, the anabolic factors PDGF-AA and PDGF-AB, as well as the catabolic factor IL-6, showed diminished levels in LR-PRP. After a 1-week washout period, PDGF-AA, PDGF-AB, and IL-6 had returned to baseline levels. Previous studies have examined the effects of naproxen on growth factors and found that VEGF and PDGF, as well as other anabolic factors, were impaired.13, 14 It is interesting that we did not

Conclusions

Naproxen use diminished several biological factors in LR-PRP; however, a 1-week washout period was sufficient for the recovery of PDGF-AA, PDGF-AB, and IL-6 to return to baseline levels. TNF-α, IL-1β, IL-8, VEGF, and FGF-2 did not show differences between the 3 time points of data collection. Discontinuing NSAIDs for a minimum of 1 week before LR-PRP treatment may improve certain biological factor levels.

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