

The effect of rofecoxib and diclofenac on blood picture in male patients

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ABSTRAT

Objectives: To assess the effect of rofecoxib and also the effect of diclofenac as a standard nonsteroidal anti-inflammatory drug (NSAD) on complete blood picture.

Methods: Complete blood picture was taken for ٢٩ male patients on rofecoxib therapy at ٢٥ mg/day for ١٤-٢١ consecutive days. Complete blood picture was also taken for ١٥ male patients on rofecoxib therapy at ١٠٠ mg/day for ١٤-٢١ consecutive days. Comparison was made between measurements of blood picture before and at the end of treatment by using Students paired t-test.

Results: Rofecoxib or diclofenac showed no significant changes in complete blood picture in the male patients in comparison with the measurements before treatment.

Conclusion: Rofecoxib or diclofenac has no significant effect on blood picture in patients when used for short term with moderate doses.

Keywords: rofecoxib, diclofenac, complete blood picture.

الخلاصة

مقدمة: لدراسة تأثير عقار روفيكوكسب على فحوصات الدم الكاملة كذلك لدراسة تأثير عقار دايلوفيناك كعقار قياسي غير ستيرويدي مضاد للالتهابات على فحوصات الدم الكاملة.

الطرق: اخذت فحوصات الدم الكاملة لتسعة وعشرين مريض من الذكور وتحت علاج روفيكوكسب بجرعة ٢٥ ملغم في اليوم لفترة ١٤-٢١ يوم بصورة متتالية. كذلك اخذت فحوصات الدم الكاملة لخمس عشرة مريض من الذكور وتحت علاج دايلوفيناك بجرعة ١٠٠ ملغم في اليوم لفترة ١٤-٢١ يوم بصورة متتالية. اجريت المقارنة باستعمال اختبار t للعينات المترابطة.

النتائج: لم يظهر عقار روفيكوكسب او عقار دايلوفيناك أي تغيير معنوي في فحوصات الدم الكاملة في المرضى الذكور عند مقارنتها مع نتائج فحوصات الدم قبل اخذ العلاج.

الاستنتاج: لا يوجد تأثير لعقار روفيكوكس او عقار دايلوفيناك على فحوصات الدم للمرضى عند استعمالها كل على حدة ولفترة قصيرة وجرعة متوسطة.

Rofecoxib is a specific cyclooxygenase-٢ (COX-٢) inhibitor and its beneficial action is similar to the traditional nonsteroidal anti-inflammatory drugs (NSAIDs) indicating similar analgesic and anti-inflammatory effects.^١ Clinical studies of rofecoxib have demonstrated efficacy equivalent to COX nonselective NSAIDs with lower rates of gastrointestinal tract side effects like endoscopic ulcers.^٢ Clearly,

COX-٢ selective inhibitors offered logical choices to alliterate pain and inflammation with fewer side effects.^٣

Diclofenac shows a high degree of anti-inflammatory, analgesic and antipyretic activity.^٤

In comparison with rofecoxib, diclofenac is a potent relatively nonselective COX inhibitor in

addition diclofenac can reduce arachidonic acid bioavailability.⁶

The haematological effects of traditional NSAIDs induced two opposing actions, in one hand, NSAIDs inhibited prostaglandins (PGS) mediated inhibition of cytokines there by increasing stem cells and colony forming unit (CFU) proliferation and differentiation, on the other hand, NSAIDs inhibited PGS mediated stimulation of erythropoietin release and consequently inhibiting the maturation of erythrocyte line.⁷

COX-2 derived PGS play the potential role in the control of cytokines production and consequent haematopoiesis.⁸ However, both COX-1 and COX-2 derived PGE may play a role in the control of erythrocyte maturation.⁹ COX-2 deficiency appears to inhibit the onset or the rate of haematopoiesis under tension conditions, but unlikely compromising eventually full haematological recovery.⁹

This study has been done to investigate the effect of rofecoxib and diclofenac on complete blood picture in male patients.

Patients and methods

This study was carried out in the department of Rheumatology and in the Haematology laboratory at Al-Salam Hospital in Mosul city, from January to July 2014, under the supervision of haematologists in the hospital.

Patients with rheumatological diseases or post-operative pain were excluded from the study. In addition, erythrocyte sedimentation rate (ESR) test was made to exclude the presence of other concurrent diseases. Complete blood picture was made at about 10.0 a.m. to avoid diurnal variation.¹⁰ Blood samples were taken from patients while they were sitting, since Penev and Kereshka¹¹ found that position of patients affects complete blood picture.

Male patients were included, who complained from simple pain like backache or joint pain. The duration of treatment was between 14-21 days. The studied groups were divided into two groups. The first group included 29 patients given rofecoxib (Inflaix, Ajanta Pharma Limited, India), (20 mg/day), their ages ranged between 29-49 years (mean±SD: 36.8±8.9 years). The second group included 10 patients given diclofenac sodium (voldic S.R., pharma. International co, Amman, Jordan), (100 mg/day sustained release), with age range between 22-44 (mean±SD: 30.0±6.3 years).

Venous blood sample (2.0 ml) was taken from the participants by venipuncture. The blood was placed in 2.0 ml EDTA (ethylene diamine tetraacetic acid) tubes. The samples were mixed well and placed on a mechanical shaker. The tests were done within the first hour after sample collection. Total white blood cell (WBC), platelets, differential WBC and reticulocyte counts were performed by using a manual microscopic method.^{12,13} Packed cell volume (PCV) and haemoglobin (Hb) were measured by microhaematocrit and Drabkin's solution methods, respectively^{14,15}. Westergren method was used for measurement of ESR⁽¹⁶⁾.

Results

No significant changes were found in Hb (haemoglobin), PCV (packed cell volume), reticulocyte, total and differential WBC, and platelet count in patient treated with rofecoxib for 14-21 days (n=29) in comparison with those measurements before treatment (Table 1).

No significant changes were found in Hb, PCV, reticulocytes, total and differential WBC, and platelet counts in patients treated with diclofenac for 14-21 days in comparison with these measurements before treatment (Table 2).

Table 1. Blood picture of rofecoxib in patients before and after treatment.

Parameters	Means±SD (n=٢٩)		Significance
	Before treatment	After treatment	
Hb (g/L)	١٣٦,٨٦±١١,٢٤	١٤٠,١٤±١٢,٦٠	NS
PCV (%)	٠,٤٣±٠,٠٠	٠,٤٣±٠,٠٤	NS
Total WBC count × ١٠ ^٩ /L			
	٧,١٠±١,٩١	٧,٠٢±٢,٠٨	NS
Differential WBC count (%)			
Neutrophils	٦٣,٦٦±١٠,٠٦	٦٦,١٠±٨,٠٠	NS
Lymphocytes	٣٣,٤٠±٩,٢٤	٣٠,٣١±٧,٨٠	NS
Monocytes	٠,٦٩±١,٤٧	٠,٢٨±٠,٨٤	NS
Eosinophils	٢,٢١±٣,٨٢	٣,٣١±٣,٨٨	NS
Differential WBC absolute count × ١٠ ^٩ /L			
Neutrophils	٤,٠٠±١,٠٠	٤,٦٨±١,٦٠	NS
Lymphocytes	٢,٣٠±٠,٨٧	٢,٠٨±٠,٧٤	NS
Monocytes	٠,٠٠±٠,١١	٠,٠٢±٠,٠٠	NS
Eosinophils	٠,١٠±٠,٢٠	٠,٢٤±٠,٣١	NS
Platelet count × ١٠ ^٩ /L			
	٢٤٠,١٧ ±٤٢١,٨	٢٤٨,٢٨±٤٨,٤١	NS

NS, insignificant, P< ٠,٠٠

Table ٢. Blood picture of diclofenac patients before and after treatment.

Parameters	Means±SD (n=٢٩)		Significance
	Before treatment	After treatment	
Hb (g/L)	١٤٠,٣٣±١١,٢٨	١٣٨,٧٤±١٠,٧٠	NS
PCV (%)	٠,٤٣±٠,٠٣	٠,٤٢±٠,٠٣	NS
Reticulocytes (%)	٠,٨٤±٠,٧٩	٠,٧٨±٠,٧٦	NS
Total WBC count × ١٠ ^٩ /L			
	٦,٣١±١,٠٦	٦,٩٨±١,٦٧	NS
Differential WBC count (%)			
Neutrophils	٦٠,٣٣±٨,٣٢	٦٢,٤٧±٦,٨٤	NS
Lymphocytes	٣١,٦٠±٧,٤٠	٣٤,٦٧±٧,٨٣	NS
Monocytes	٠,٣٢±٠,٧٢	٠,٣٣±٠,٩٠	NS
Eosinophils	٢,٠٧±٢,٧١	٢,٠٣±٣,٠٧	NS
Differential WBC absolute count × ١٠ ^٩ /L			
Neutrophils	٤,١٨±١,٢٧	٤,٣٨±١,١٧	NS
Lymphocytes	١,٩٩±٠,٦٠	٢,٣٩±٠,٧١	NS
Monocytes	٠,٠٢±٠,٠٠	٠,٠٢±٠,٠٦	NS
Eosinophils	٠,١٢±٠,١٧	٠,١٩±٠,٢٠	NS
Platelet count × ١٠ ^٩ /L			
	٢٧٦,٦٧±٧٠,١٨	٣١١,٣٢±٦٨,١٢	NS

NS, insignificant, P< ٠,٠٠

Discussion

In the rofecoxib treated patients, complete blood picture was not significantly different from pretreatment values. These results are in agreement with other studies.^{١٥,١٦} These authors did not find any significant effect of short-term use of rofecoxib on complete blood picture. However, COX- γ inhibition in vitro and in vivo was associated with increased WBC count in the peripheral blood including granulocyte, monocytes and lymphocytes.^٧ Accordingly, the short duration and moderate dose might not be enough to significantly affect the blood picture.

In this study, complete blood picture was not significantly different in diclofenac treated patients in comparison with the pretreatment values. These results were in agreement with other studies.^{١٧,١٨} Emery et al.^{١٧} found that the haematological effect of diclofenac required long term use. Moreover, Hofer et al.^{١٩} found that the effect of diclofenac on blood required the use of toxic doses. Thus, the short term duration and the moderate dose of diclofenac, in this study, might be contributing factors for the lack of significant effects on the blood picture.

Non-steroidal antiinflammatory drugs and COX- γ selective inhibitors affect the function rather than proliferation of platelets where they can change the haemostasis by tipping the balance that is naturally occurring between the prothrombic thromboxine A γ (TXA γ) and antithrombic prostacycline (PGI γ).^{٢٠} In addition, rofecoxib diminished platelet aggregation and inhibited-mediated thrombosis in vitro model of thrombosis.^{٢١}

In conclusion, short term use of moderate dose of diclofenac or rofecoxib has no effect on blood picture in patients suffering from miner pain.

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