INTERNATIONAL JOURNAL OF ADVANCED BIOLOGICAL RESEARCH

www.scienceandnature.org

Short Communication

MELOXICAM INDUCED HAEMATOLOGICAL EFFECTS IN RATS

P. Bharani[a], A.K Naik[b] and S.C Parija[c]
Organization address: College of Veterinary Science & Animal Husbandry, Bhubaneshwar, Odisha

ABSTRACT
Non-steroidal anti-inflammatory drugs (NSAID) are among the oldest and most widely used drugs in human history. Meloxicam, a non steroidal anti-inflammatory drug exhibits its effect by inhibiting the formation of prostaglandins through the inhibition of COX-2. The present study done to evaluate meloxicam induced haematological parameters in Wistar rats. Eighteen Wistar rats divided into three groups *i.e*. Group I, Group II and Group III. Group I rats received only Normal saline @ 1ml/kg and it is the negative control. Group II received @ 4 mg/kg B.W. and Group III rats received 8 mg/kg B.W. orally dosed for 28 days. Dose-dependent symptoms and lesions were observed after meloxicam treatment. Haematological values were altered after 28 days of administration. TEC, PCV, Hb were decreased and TLC count was significantly increased in both doses of meloxicam treated groups in a dose-dependent manner. Neutrophil count was increased and lymphocyte count decreased in a dose-dependent manner. It was concluded that meloxicam caused variation in the haematological parameters and or the selected dose and duration.

KEY WORDS: NSAID, Meloxicam, COX-2, Hb, TLC, PCV.

INTRODUCTION

NSAIDs (nonsteroidal anti-inflammatory drugs) are a class of drugs with analgesic, anti-inflammatory, and antipyretic effects (Litalien and Jacqz-Aigrain, 2001). Meloxicam is an anti-inflammatory class of drug and belongs to Oxicam family of NSAIDs (Vane and Botting, 1997). Meloxicam has been shown to be COX-2 preferential, particularly at its lowest therapeutic dose, and is anti-inflammatory by inhibiting prostanoid synthesis in inflammatory cells. Meloxicam is a nonsteroidal anti-inflammatory drug (NSAID) in the oxicam family, aggressively promoted in India and attained the top position indicated for the control of inflammation and pain in acute and chronic musculoskeletal disorders in dogs (Fleischmann *et al.,* 2002). Although many studies carried out for meloxicam toxicity, very fewer data available for haematological effects. Hence, the study was conducted to investigate clinical symptoms, hematological changes alteration that occur due to various doses of meloxicam

MATERIALS AND METHODS

Animals

Eighteen Wistar albino male rats (6 weeks old) procured from CPCSEA breed vendor were used in the experiments. Animals were feed on standard rodent pellet feed with drinking water *ad libitum* and maintained on a 12-hour light and dark cycle. In addition, rats were kept for 7 days in a laboratory environment before the study for acclimatization and quarantine as per Committee for the Purpose of Control and Supervision of Experiments.

Study design

The three groups, animals of Gr I-NC received 1ml/kg of NS (0.9%), Gr-II (low dose) received 4mg/Kg BW& Gr-III (High dose) received 8mg/kg BW gavaged for 28 days. LD50 value for meloxicam is 84 mg/kg BW. Under anaesthesia of Isoflurane, Collected approximately 5-10 IU of blood from retro-orbital plexus. We used Statistical analysis System (SAS) to analyze our data.

RESULTS

TABLE 1: Mean haematological values of subacute toxicity study of meloxicam in Rats, data expressed as (Mean ± SEM)

	Gr-I	Gr-II	Gr-III
TEC	7.58 ± 0.122^{a}	6.30 ± 0.175^{b}	5.89 ± 0.105^{c}
Hb	14.128 ± 0.202^{a}	10.87 ± 0.274^{c}	8.93 ± 0.879^{d}
PCV	40.75 ± 0.484^{a}	34.43 ± 0.215^{c}	32.39 ± 0.248^{d}
TLC	17.50 ± 0.201^{c}	28.85 ± 0.187^{b}	33.70 ± 0.365^{a}
Neutrophil	16.167 ± 0.307^{d}	26.66 ± 0.494^{c}	28.38 ± 0.494^{b}
Lymphocytes	79 ± 1.136^{a}	62.5 ± 0.763^{b}	58.66 ± 1.706^{c}

N.B.: Mean bearing different superscript differs significantly at 5% level ($P<0.05$).Superscripts are to be read column wise for mean comparison. n=6 in each group. Results were analysed by the Statistical Analysis System (SAS).

There was significant variation between all the treated groups; however, there was numerical depression of the mean TEC values in the treatment groups than the control. Hb and PCV showed a significant decrease in between treatment groups. TLC showed a significant rise in groups II and III in comparison to negative control Group-I. Neutrophil count was observed to increase significantly with the increase in the dose in the treated groups in comparison to control group. Lymphocyte count decreased significantly in the treated groups in comparison to negative control groups. Table-1 showing summarized hematological parameters after treatment.

DISCUSSION

PCV & Haemoglobin values were reduced because meloxicam may cause injury haemopoetic stem cells thereby reducing blood cells in rats (Merchant, 2004). Similar results of toxicity were observed with meloxicam treated rats (Bhadja, 2007), aspirin in mice (Merchant *et al*., 2004), Loxoprofen sodium (Sharma *et al*., 2002) and lornoxicam dosed monkeys (Atzpodien*et al.,* 1997). The similar finding was observed in dog administered with NSAID (Sharma *et al.,* 2002). After feeding the meloxicam for 16 days, anemia was observed in dogs after feeding for 16 days (Alencar, *et al.* 2003). The results which we obtained are in line with referred literature.

CONCLUSION

Haematological values were altered after 28 days of administration. TEC, PCV, Hb were decreased and TLC count was significantly increased in both doses of meloxicam treated groups in a dose-dependent manner. Neutrophil count was increased and lymphocyte count decreased in a dose-dependent manner.

REFERENCES

Alencar, M.M., Pinto, M.T. and Oliveria, D.M. (2003) Margin of safety of meloxicam: deleterious effect on blood cells and GIT. Ciencia Rural 33(3), 525-532

Atzpodien, E., Mehdi, N., Clarke, D. and Radhofer S. (1997) Subacute and chronic oral toxicity of lornoxicam in cynomolgusmonkeys.Food and Chemical Toxicology. 35(5): 465-474.

Bhadja, N.D. (2007) Sub-acute oral toxicity study of meloxicam in Wistar rats. M.V.Sc thesis submitted to Anand Agricultural University, Anand.

Fleischmann, R., Iqbal, I. and Slobodin, G. (2002) Meloxicam. Expert Opin Pharmacother. Oct, 3(10):1501-12.

Litalien, C. and Jacqz-Aigrain, E. (2001) Risks and benefits of nonsteroidal anti-inflammatory drugs in children: a comparison with paracetamol. *Paediatr Drugs,* **3**(11):817-58**.**

Merchant, M.A. and Modi D.N. (2004) Acute and chronic effects of aspirin on hematological parameters and hepatic ferritin expression in mice. Indian J. Pharmacol. 36(4) 226-230.

Sharma, A.B. (2002) Studies on the Efficacy of Certain Non-Steroidal Anti-inflammatory Drugs. M.V.Sc. Thesis, J.N.K.V.V., Jabalpur.