SUMMARY OF PRODUCT CHARACTERISTICS

1 NAME OF THE MEDICINAL PRODUCT

Meloxicam 15 mg Tablets.

2 QUALITATIVE AND QUANTITATIVE COMPOSITION

Each tablet contains 15 mg of meloxicam.

Excipients with known effect: 126.00 mg of lactose.

For the full list of excipients see section 6.1.

3 PHARMACEUTICAL FORM

Tablet.

The 15 mg tablets are light yellow, round, biconvex bevelledged tablets with B and 19 debossed on one side and plain on the reverse.

The 15 mg tablet can be divided into equal halves.

4 CLINICAL PARTICULARS

4.1 Therapeutic indications

- Short-term symptomatic treatment of exacerbation of osteoarthrosis
- Long-term symptomatic treatment of rheumatoid arthritis or of ankylosing spondylitis

4.2 Posology and method of administration

Posology

Undesirable effects may be minimised by using the lowest effective dose for the shortest duration necessary to control symptoms (see section 4.4). The patient's need for symptomatic relief and response to therapy should be re-evaluated periodically, especially in patients with osteoarthritis.

- *Exacerbation of osteoarthrosis:* 7.5 mg/day (one 7.5mg tablet or half a 15mg tablet). If necessary, in the absence of improvement, the dose may be increased to 15 mg/day (two 7.5 mg tablets or one 15 mg tablet).
- *Rheumatoid arthritis, ankylosing spondylitis:* 15mg/day (two 7.5mg tablets or one 15mg tablet). (See also 'Special populations').

According to the therapeutic response, the dose may be reduced to 7.5 mg/day (one 7.5 mg tablet or half a 15 mg tablet).

DO NOT EXCEED THE DOSE OF 15 MG/DAY.

Special populations

Elderly patients and patients with an increased risk of undesirable effects (see section 5.2):

The recommended dose for long-term treatment of rheumatoid arthritis and ankylosing spondylitis in elderly patients is 7.5 mg per day. Patients with increased risk for adverse reactions should start treatment with 7.5 mg per day (see section 4.4).

Renal impairment (see section 5.2):

In dialysis patients with severe renal failure, the dose should not exceed 7.5 mg per day. No dose reduction is required in patients with mild to moderate renal impairment (i.e. patients with a creatinine clearance of greater than 25 ml/min). (For patients with non-dialysed severe renal failure, see section 4.3).

Hepatic impairment (see section 5.2):

No dose reduction is required in patients with mild to moderate hepatic impairment. (For patients with severely impaired liver function, see section 4.3).

Paediatric population:

Meloxicam is contraindicated in children and adolescents aged under 16 years (see section 4.3).

This medicinal product is available in other dosages which may be more suitable.

Method of administration

Oral use

The total daily amount should be taken as a single dose, with water or another liquid, during a meal.

4.3 Contraindications

Meloxicam is contraindicated in the following situations:

- third trimester of pregnancy (see section 4.6).
- children and adolescents aged under 16 years.
- hypersensitivity to the active substance or to any of the excipients listed in section 6.1, or hypersensitivity to substances with a similar action, e.g. NSAIDs, aspirin. Meloxicam should not be given to patients who have developed signs of asthma, nasal polyps, angioneurotic oedema or urticaria following the administration of aspirin or other NSAIDs.
- history of gastrointestinal bleeding or perforation, related to previous NSAID therapy.
- active or history of recurrent peptic ulcer/haemorrhage (two or more distinct episodes of proven ulceration or bleeding).
- severely impaired liver function.
- non-dialysed severe renal failure.
- gastrointestinal bleeding, history of cerebrovascular bleeding or other bleeding disorders.
- severe heart failure.

4.4 Special warnings and precautions for use

Undesirable effects may be minimised by using the lowest effective dose for the shortest duration necessary to control the symptoms (see section 4.2, and GI and cardiovascular risks below).

The recommended maximum daily dose should not be exceeded in case of insufficient therapeutic effect, nor should an additional NSAID be added to the therapy because this may increase the toxicity while therapeutic advantage has not been proven. The use of meloxicam with concomitant NSAIDs including cyclooxygenase-2 selective inhibitors should be avoided.

Meloxicam is not appropriate for the treatment of patients requiring relief from acute pain.

In the absence of improvement after several days, the clinical benefit of the treatment should be reassessed.

Any history of oesophagitis, gastritis and/or peptic ulcer must be sought in order to ensure their total cure before starting treatment with meloxicam. Attention should be routinely paid to the possible onset of a recurrence in patients treated with meloxicam and with a past history of this type.

Gastrointestinal effects:

GI bleeding, ulceration or perforation, which can be fatal, has been reported with all NSAIDs at any time during treatment, with or without warning symptoms or previous history of serious GI events.

The risk of GI bleeding, ulceration or perforation is higher with increasing NSAID doses, in patients with a history of ulcer, particularly if complicated with haemorrhage or perforation (see section 4.3) and in the elderly. These patients should commence treatment on the lowest dose available. Combination therapy with protective agents (e.g. misoprostol or proton pump inhibitors) should be considered for these patients, and also for patients requiring concomitant low dose aspirin, or other drugs likely to increase gastrointestinal risk (see below and 4.5).

Patients with a history of GI toxicity, particularly when elderly, should report any unusual abdominal symptoms (especially GI bleeding) particularly in the initial stages of treatment.

In patients receiving concomitant medications which could increase the risk of ulceration or bleeding, such as heparin as curative treatment or given in geriatrics, anticoagulants such as warfarin, or other non-steroidal anti-inflammatory drugs, or acetylsalicylic acid given at doses ≥ 500 mg as single intake or ≥ 3g as total daily amount, the combination with meloxicam is not recommended (see section 4.5).

When GI bleeding or ulceration occurs in patients receiving meloxicam, the treatment should be withdrawn.

NSAIDs should be given with care to patients with a history of gastrointestinal disease (ulcerative colitis, Crohn's disease) as these conditions may be exacerbated (see section 4.8).

Cardiovascular and cerebrovascular effects

Appropriate monitoring and advice are required for patients with a history of hypertension and/or mild to moderate congestive heart failure as fluid retention and oedema have been reported in association with NSAID therapy.

Clinical monitoring of blood pressure for patients at risk is recommended at baseline and especially during treatment initiation with meloxicam.

Clinical trial and epidemiological data suggest that use of some NSAIDs including meloxicam (particularly at high doses and in long term treatment) may be associated with a small increased risk of arterial thrombotic events (for example myocardial infarction or stroke). There are insufficient data to exclude such a risk for meloxicam.

Patients with uncontrolled hypertension, congestive heart failure, established ischaemic heart disease, peripheral arterial disease, and/or cerebrovascular disease should only be treated with meloxicam after careful consideration. Similar consideration should be made before initiating longer-term treatment of patients with

risk factors for cardiovascular disease (e.g. hypertension, hyperlipidaemia, diabetes mellitus, smoking).

Skin reactions

Life-threatening cutaneous reactions (Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN)) have been reported with the use of meloxicam.

Patients should be advised of the signs and symptoms and monitored closely for skin reactions. The highest risk for occurrence of SJS or TEN is within the first weeks of treatment.

If symptoms or signs of SJS or TEN (e.g. progressive skin rash often with blisters or mucosal lesions) are present, meloxicam treatment should be discontinued.

The best results in managing SJS and TEN come from early diagnosis and immediate discontinuation of any suspect drug. Early withdrawal is associated with a better prognosis.

If the patient has developed SJS or TEN with the use of meloxicam, meloxicam must not be re-started in this patient at any time.

Cases of fixed drug eruption (FDE) have been reported with meloxicam.

Meloxicam should not be reintroduced in patients with a history of meloxicam-related FDE. Potential cross reactivity might occur with other oxicams.

Parameters of liver and renal function

As with most NSAIDs, occasional increases in serum transaminase levels, increases in serum bilirubin or other liver function parameters, as well as increases in serum creatinine and blood urea nitrogen and other laboratory findings, have occasionally been reported. The majority of these instances involved transient and slight abnormalities. Should any such abnormality prove significant or persistent, the administration of meloxicam should be stopped and appropriate investigations undertaken.

Functional renal failure

NSAIDs, by inhibiting the vasodilating effect of renal prostaglandins, may induce a functional renal failure by reduction of glomerular filtration. This adverse event is dose-dependent. At the beginning of the treatment, or after dose increase, careful monitoring of diuresis and renal function is recommended in patients with the following risk factors:

- elderly
- concomitant treatments such as ACE inhibitors, angiotensin-II antagonists, sartans, diuretics (see section 4.5.)
- hypovolaemia (whatever the cause)
- congestive heart failure
- renal failure
- nephrotic syndrome
- lupus nephropathy

- severe hepatic dysfunction (serum albumin <25 g/l or Child-Pugh score ≥10).

In rare instances, NSAIDs may be the cause of interstitial nephritis, glomerulonephritis, renal medullary necrosis or nephrotic syndrome.

The dose of meloxicam in patients with end-stage renal failure on haemodialysis should not be higher than 7.5 mg. No dose reduction is required in patients with mild or moderate renal impairment (i.e. in patients with a creatinine clearance of greater than 25 ml/min).

Sodium, potassium and water retention:

Induction of sodium, potassium and water retention and interference with the natriuretic effects of diuretics may occur with NSAIDs. Furthermore, a decrease of the antihypertensive effect of antihypertensive drugs can occur (see section 4.5). Consequently oedema, cardiac failure or hypertension may be precipitated or exacerbated in susceptible patients as a result. Clinical monitoring is therefore necessary, for patients at risk (see sections 4.2 and 4.3). A decrease of the antihypertensive effect of antihypertensive drugs can occur (see section 4.5).

Hyperkalaemia:

Hyperkalaemia can be favoured by diabetes or concomitant treatment known to increase kalaemia (see section 4.5.). Regular monitoring of potassium values should be performed in such cases.

Combination with pemetrexed

In patients with mild to moderate renal insufficiency receiving pemetrexed, meloxicam should be interrupted for at least 5 days prior to, on the day of, and at least 2 days following permextred administration (see section 4.5).

Other warnings and precautions

Adverse reactions are often less well tolerated in elderly, fragile or weakened individuals, who require careful monitoring. As with other NSAIDs, particular caution is required in the elderly, in whom renal, hepatic and cardiac functions are frequently impaired. The elderly have an increased frequency of adverse reactions to NSAIDs especially gastrointestinal bleeding and perforation which may be fatal (see section 4.2).

Meloxicam, as any other NSAID, may mask symptoms of an underlying infectious disease.

The use of meloxicam may impair fertility and is not recommended in women attempting to conceive. In women who have difficulties conceiving, or who are undergoing investigation of infertility, withdrawal of meloxicam should be considered (see section 4.6).

Meloxicam Tablets contain lactose. Patients with rare hereditary problems of galactose intolerance, the Lapp-lactose deficiency or glucose-galactose malabsorption should not take this medication.

This medicine contains less than 1 mmol sodium (23 mg) per tablet, that is to say essentially ‘sodium free’

4.5 Interaction with other medicinal products and other forms of interaction

Interaction studies have only been performed in adults.

Risks relating to hyperkalaemia

Certain medicinal products or therapeutic groups may promote hyperkalaemia: potassium salts, potassium-sparing diuretics, angiotensin – converting enzyme (ACE) inhibitors, angiotensin II receptor antagonists, non-steroidal anti-inflammatory drugs, (low molecular weight or unfractionated) heparins, cyclosporine, tacrolimus and trimethoprim.

The onset of hyperkalaemia may depend on whether there are associated factors.

The risk is increased when the above mentioned medicinal products are co-administered with meloxicam.

Pharmacodynamic Interactions:

Other non-steroidal anti-inflammatory drugs(NSAIDs) and acetylsalicylic acid : combination (see section 4.4) with other non-steroidal anti-inflammatory drugs, including acetylsalicylic acid given at doses ≥ 500 mg as single intake or ≥ 3 g as total daily amount is not recommended.

Corticosteroids (e.g. Glucocorticoids):

The concomitant use with corticosteroids requests caution because of an increased risk of bleeding or gastrointestinal ulceration.

Anticoagulants or heparin:

Considerably increased risk of bleeding, via inhibition of platelet function and damage to the gastroduodenal mucosa. NSAIDs may enhance the effects of anti-coagulants such as warfarin (see section 4.4). The concomitant use of NSAIDs and anticoagulants or heparin administered in geriatrics or at curative dose is not recommended (see section 4.4).

In remaining cases (e.g. preventive doses) of heparin use caution is necessary due to an increased bleeding risk. Careful monitoring of the INR is required if it proves impossible to avoid such combination.

Thrombolytics, anti-platelet agents:

Increased risk of bleeding, via inhibition of platelet function and damage to the gastroduodenal mucosa .

Selective serotonin reuptake inhibitors (SSRIs):

Increased risk of gastrointestinal bleeding.

Diuretics, ACE inhibitors and angiotensin-II Antagonists:

NSAIDs may reduce the effect of diuretics and other antihypertensive drugs. In some patients with compromised renal function (e.g. dehydrated patients or elderly patients with compromised renal function) the co-administration of an ACE inhibitor or Angiotensin-II antagonist and agents that inhibit cyclo-oxygenase may result in further deterioration of renal function, including possible acute renal failure, which is usually reversible. Therefore, the combination should be administered with caution, especially in the elderly. Patients should be adequately hydrated and consideration should be given to monitoring of renal function after initiation of concomitant therapy, and periodically thereafter (see also section 4.4).

Other anti-hypertensive drugs (e.g. beta-blockers):

As for the latter, a decrease in the anti-hypertensive effect of beta-blockers (due to inhibition of prostaglandins with vasodilatory effect) can occur.

Calcineurin inhibitors (e.g. cyclosporin, tacrolimus):

Nephrotoxicity of calcineurin inhibitors may be enhanced by NSAIDs via renal prostaglandin-mediated effects. During combined treatment renal function is to be measured. A careful monitoring of the renal function is recommended, especially in the elderly.

Desferasirox

The concomitant administration of meloxicam with desferasirox may increase the risk of gastrointestinal adverse reactions. Caution should be exercised when combining these medicinal products.

<u>Pharmacokinetic interactions (Effect of meloxicam on the pharmacokinetics of other drugs):</u>

Lithium:

NSAIDs have been reported to increase blood lithium levels (via decreased renal excretion of lithium), which may reach toxic values. The concomitant use of lithium and NSAIDs is not recommended (see section 4.4). If this combination appears necessary, lithium plasma concentrations should be monitored carefully during the initiation, adjustment and withdrawal of meloxicam treatment.

Methotrexate:

NSAIDs can reduce the tubular secretion of methotrexate, thereby increasing the plasma concentrations of methotrexate. For this reason, for patients on high dosages of methotrexate (more than 15 mg/week) the concomitant use of NSAIDs is not recommended (see section 4.4).

The risk of an interaction between NSAID preparations and methotrexate should be considered also in patients on low doses of methotrexate, especially in patients with impaired renal function. In case combination treatment is necessary, blood count and renal function should be monitored. Caution should be taken in case both NSAID and methotrexate are given within 3 days, in which case the plasma level of methotrexate may increase and cause increased toxicity.

Although the pharmacokinetics of methotrexate (15mg/week) were not relevantly affected by concomitant meloxicam treatment, it should be considered that the haematological toxicity of methotrexate can be amplified by treatment with NSAID drugs (see above). (See section 4.8).

Pemetrexed

For the concomitant use of meloxicam with pemetrexed in patients with mild to moderate renal impairment (creatinine clearance from 45 to 79 ml/min), the administration of meloxicam should be paused for 5 days before, on the day of, and 2 days following pemetrexed administration. If a combination of meloxicam with pemetrexed is necessary, patients should be closely monitored, especially for myelosuppression and gastrointestinal adverse reactions. In patients with severe renal impairment (creatinine clearance below 45 ml/min) the concomitant administration of meloxicam with pemetrexed is not recommended.

In patients with normal renal function (creatinine clearance > 80 ml/min), doses of 15 mg meloxicam may decrease pemetrexed elimination, and consequently, increase the occurrence of pemetrexed adverse events. Therefore, caution should be exercised when administering 15 mg meloxicam concurrently with pemetrexed to patients with normal renal function (creatinine clearance > 80 ml/min).

Pharmacokinetic Interactions: Effects of other drugs on the pharmacokinetics of meloxicam:

Cholestyramine:

Cholestyramine accelerates the elimination of meloxicam by interrupting the enterohepatic circulation so that clearance for meloxicam increases by 50% and the half-life decreases to 13 ± 3 hrs. This interaction is of clinical significance.

No clinically relevant pharmacokinetic drug-drug interactions were detected with regard to the concomitant administration of antacids, cimetidine and digoxin.

4.6 Fertility, Pregnancy and lactation

Fertility

The use of meloxicam, as with any drug known to inhibit cyclooxygenase/prostaglandin synthesis, may impair female fertility and is not recommended in women attempting to conceive. In women who have difficulties conceiving or who are undergoing investigation of infertility, withdrawal of meloxicam should be considered.

Pregnancy

Inhibition of prostaglandin synthesis may adversely affect the pregnancy and/or the embryo/foetal development. Data from epidemiological studies suggest an increased risk of miscarriage and of cardiac malformation and gastroschisis after use of a prostaglandin synthesis inhibitor in early pregnancy. The absolute risk for

cardiovascular malformation was increased from less than 1%, up to approximately 1.5 %. The risk is believed to increase with dose and duration of therapy. In animals, administration of a prostaglandin synthesis inhibitor has been shown to result in increased pre- and post-implantation loss and embryo-foetal lethality. In addition, increased incidences of various malformations, including cardiovascular, have been reported in animals given a prostaglandin synthesis inhibitor during the organogenetic period.

From the 20th week of pregnancy onward, meloxicam use may cause oligohydramnios resulting from foetal renal dysfunction. This may occur shortly after treatment initiation and is usually reversible upon discontinuation. In addition, there have been reports of ductus arteriosus constriction following treatment in the second trimester, most of which resolved after treatment cessation. Therefore, during the first and second trimester of pregnancy, meloxicam should not be given unless clearly necessary. If meloxicam is used by a woman attempting to conceive, or during the first and second trimester of pregnancy, the dose should be kept as low and duration of treatment as short as possible. Antenatal monitoring for oligohydramnios and ductus arteriosus constriction should be considered after exposure to meloxicam for several days from gestational week 20 onward. Meloxicam should be discontinued if oligohydramnios or ductus arteriosus constriction are found.

During the third trimester of pregnancy, all prostaglandin synthesis inhibitors may expose

*the foetus to:

- cardiopulmonary toxicity (premature constriction/closure of the ductus arteriosus and pulmonary hypertension);
- renal dysfunction (see above);

*the mother and the neonate, at the end of pregnancy, to:

- possible prolongation of bleeding time, an anti-aggregating effect which may occur even at very low doses;
- inhibition of uterine contractions resulting in delayed or prolonged labour.

  Consequently, meloxicam is contraindicated during the third trimester of pregnancy (see sections 4.3 and 5.3).

Breastfeeding

While no specific experience exists for meloxicam, NSAIDs are known to pass into mother's milk. Administration therefore is not recommended in women who are breastfeeding.

4.7 Effects on ability to drive and use machines

No specific studies on the effect on the ability to drive or use machines have been performed. However, on the basis of the pharmacodynamic profile and reported adverse drug reactions, meloxicam is likely to have no or negligible influence on these abilities. However, when visual disturbances including blurred vision, dizziness, drowsiness, vertigo or other central nervous system disturbances occur, it is advisable to refrain from driving and operating machinery.

4.8 Undesirable effects

a) Summary of the safety profile
Clinical trial and epidemiological data suggest that use of some NSAIDs (particularly at high doses and in long term treatment) may be associated with a small increased risk of arterial thrombotic events (for example myocardial infarction or stroke) (see section 4.4).
Oedema, hypertension, and cardiac failure, have been reported in association with NSAID treatment.
The most commonly-observed adverse events are gastrointestinal in nature. Peptic ulcers, perforation or GI bleeding, sometimes fatal, particularly in the elderly, may occur (see section 4.4). Nausea, vomiting, diarrhoea, flatulence, constipation, dyspepsia, abdominal pain, melaena, haematemesis, ulcerative stomatitis, exacerbation of colitis and Crohn's disease (see section 4.4) have been reported following administration. Less frequently, gastritis has been observed.
Severe cutaneous adverse reactions (SCARs): Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN) have been reported (see section 4.4).

The frequencies of adverse drug reactions given below are based on corresponding occurrences of reported adverse events in 27 clinical trials with a treatment duration of at least 14 days. The information is based on clinical trials involving 15197 patients who have been treated with daily oral doses of 7.5 or 15 mg Meloxicam tablets or capsules over a period of up to one year. Adverse drug reactions that have come to light as a result of reports received in relation to administration of the marketed product are included.
Adverse reactions have been ranked under headings of frequency using the following convention:
Very common ($\geq$1/10); common ($\geq$1/100 to <1/10); uncommon ($\geq$1/1,000 to <1/100); rare ($\geq$1/10,000 to <1/1.000); very rare (<1/10,000), not known (cannot be estimated from the available data)

b) Table of adverse reactions

Blood and lymphatic system disorders

Uncommon:	Anaemia
Rare:	Blood count abnormalities: (including differential white cell count) leukopenia, thrombocytopenia

Very rare cases of agranulocytosis have been reported (see section c).

Immune system disorders

Uncommon:	Allergic reactions other than anaphylactic or anaphylactoid reactions
Not known:	Anaphylactic reaction, anaphylactoid reaction

Psychiatric disorders

Rare:	Mood altered, nightmares
Not known:	Confusional state, disorientation

Nervous system disorders

Common:	Headache
Uncommon:	Dizziness, somnolence

Eye disorders

Rare:	Visual disturbances including blurred vision; conjunctivitis

Ear and labyrinth disorders

Uncommon	Vertigo
Rare:	Tinnitus

Cardiac Disorders

Rare:	Palpitations

Cardiac failure has been reported in association with NSAID treatment.

Vascular disorders

Uncommon:	Increase in blood pressure (see section 4.4), flushing

Respiratory, thoracic and mediastinal disorders

Rare:	Asthma in individuals allergic to aspirin or other NSAIDs

Gastrointestinal disorders

Very common:	Gastrointestinal disorders such as dyspepsia, nausea, vomiting, abdominal pain, constipation, flatulence, diarrhoea
Uncommon:	Occult or macroscopic gastrointestinal bleeding, stomatitis, gastritis, eructation
Rare:	Colitis, gastroduodenal ulcer, oesophagitis
Very rare:	Gastrointestinal perforation
Not known:	Pancreatitis

Gastrointestinal haemorrhage, ulceration or perforation may sometimes be severe and potentially fatal, especially in the elderly (see section 4.4).

Hepato-biliary disorders

Uncommon:	Liver function disorder (e.g. raised transaminases or bilirubin)
Very rare:	Hepatitis

Skin and subcutaneous tissue disorders

Uncommon:	Angioedema, pruritus, rash
Rare:	Stevens - Johnson syndrome and toxic epidermal necrolysis, urticaria
Very rare:	Dermatitis bullous, erythema multiforme

Not known:	Photosensitivity reaction, fixed drug eruption (see Section 4.4)

Renal and urinary disorders

Uncommon:	Sodium and water retention, hyperkalaemia (see section 4.4 and section 4.5), renal function test abnormal (increased serum creatinine and/or serum urea)
Very rare:	Acute renal failure in particular in patients with risk factors (see section 4.4)

General disorders and administration site conditions

Uncommon:	Oedema including oedema of the lower limbs

c) Description of selected adverse reactions
Very rare cases of agranulocytosis have been reported in patients treated with meloxicam and other potentially myelotoxic drugs (see section 4.5).

d) Adverse reactions which have not been observed yet in relation to the product but which are generally accepted as being attributable to other compounds in the class
Organic renal injury probably resulting in acute renal failure: very rare cases of interstitial nephritis, acute tubular necrosis, nephritic syndrome and papillary necrosis have been reported (see section 4.4).

Reporting of suspected adverse reactions
Reporting suspected adverse reactions after authorisation of the medicinal product is important. It allows continued monitoring of the benefit/risk balance of the medicinal product. Healthcare professionals are asked to report any suspected adverse reactions via the Yellow Card Scheme Website: www.mhra.gov.uk/yellowcard or search for MHRA Yellow Card in the Google Play or Apple App Store.

4.9 Overdose

Symptoms following acute NSAID overdose are usually limited to lethargy, drowsiness, nausea, vomiting and epigastric pain, which are generally reversible with supportive care. Gastrointestinal bleeding can occur.

Severe poisoning may result in hypertension, acute renal failure, hepatic dysfunction, respiratory depression, coma, convulsions, cardiovascular collapse and cardiac arrest. Anaphylactoid reactions have been reported with therapeutic ingestion of NSAID's and may occur following an overdose.

Patients should be managed with symptomatic and supportive care following an NSAID overdose. Accelerated removal of Meloxicam by 4g oral doses of cholestyramine given three times a day was demonstrated in a clinical trial.

5 PHARMACOLOGICAL PROPERTIES

5.1 Pharmacodynamic properties

Pharmacotherapeutic Group: Anti-inflammatory and anti-rheumatic products, non steroids, oxicams.

ATC Code: M01A C06:

Meloxicam is a non-steroidal anti-inflammatory drug (NSAID) of the oxicam family, with anti-inflammatory, analgesic and antipyretic properties.

The anti-inflammatory activity of meloxicam has been proven in classical models of inflammation. As with other NSAIDs, its precise mechanism of action remains unknown. However, there is at least one common mode of action shared by all NSAIDs (including meloxicam): inhibition of the biosynthesis of prostaglandins, known inflammation mediators.

5.2 Pharmacokinetic properties

Absorption

Meloxicam is well absorbed from the gastrointestinal tract, which is reflected by a high absolute bioavailability of about 90% following oral administration (capsule). Tablets, oral suspension and capsules were shown to be bioequivalent.

Following single dose administration of meloxicam, mean maximum plasma concentrations are achieved within 2 hours for the suspension and within 5-6 hours with solid oral dosage forms (capsules and tablets). With multiple dosing, steady state conditions were reached within 3 to 5 days. Once daily dosing leads to mean drug plasma concentrations with a relatively small peak-trough fluctuation in the range of 0.4 - 1.0 µg/mL for 7.5 mg doses and 0.8 - 2.0µg/mL for 15 mg doses, respectively (C_{min} and C_{max} at steady state, correspondingly). Mean maximum plasma concentrations of meloxicam at steady state are achieved within 5 to 6 hours for the tablets, capsules and the oral suspension, respectively. Extent of absorption of meloxicam following oral administration is not altered by concomitant food intake or the use of inorganic antacids.

Distribution

Meloxicam is very strongly bound to plasma proteins, essentially albumin (99%). Meloxicam penetrates into synovial fluid to give concentrations approximately half of those in plasma.

Volume of distribution is low, i.e. approx. 11 L after i.m. or i.v. administration and shows interindividual variation in the order of 7 – 20 %. The volume of distribution following administration of multiple oral doses of meloxicam (7.5 to 15 mg) is about 16 L with coefficients of variation ranging from 11 to 32 %.

Biotransformation

Meloxicam undergoes extensive hepatic biotransformation. Four different metabolites of meloxicam were identified in the urine, which are all pharmacodynamically inactive. The major metabolite, 5'-carboxymeloxicam (60% of dose), is formed by oxidation of an intermediate metabolite 5'- hydroxymethylmeloxicam, which is also excreted to a lesser extent (9% of dose). In vitro studies suggest that CYP 2C9 plays an important role in this metabolic pathway, with a minor contribution from CYP 3A4 isoenzyme. The patient's peroxidase activity is probably responsible for the other two metabolites, which account for 16% and 4% of the administered dose respectively.

Elimination

Meloxicam is excreted predominantly in the form of metabolites and to equal extents in urine and faeces. Less than 5% of the daily dose is excreted unchanged in faeces, while only traces of the parent compound are excreted in urine.

The mean elimination half-life varies between 13 and 25 hours after oral, i.m. and i.v. administration. Total plasma clearance amounts about 7 – 12 mL/min following single doses orally, intravenously or rectally administered.

Linearity/non-linearity

Meloxicam demonstrates linear pharmacokinetics in the therapeutic dose range of 7.5 mg to 15 mg following per oral or intramuscular administration.

Special populations

Patients with hepatic/renal insufficiency:

Neither hepatic, mild nor moderate renal insufficiency have a substantial effect on meloxicam pharmacokinetics. Subjects with moderate renal impairment had significant higher total drug clearance. A reduced protein binding is observed in patients with terminal renal failure. In terminal renal failure, the increase in the volume of distribution may result in higher free meloxicam concentrations, and a daily dose of 7.5 mg must not be exceeded (see section 4.2).

Elderly:

Elderly male subjects exhibited similar mean pharmacokinetic parameters compared to those of young male subjects. Elderly female patients showed higher AUC-values and longer elimination half-lives compared to those of young subjects of both genders. Mean plasma clearance at steady state in elderly subjects was slightly lower than that reported for younger subjects.

5.3 Preclinical safety data

The toxicological profile of meloxicam has been found in preclinical studies to be identical to that of NSAIDs: gastrointestinal ulcers and erosions, renal papillary necrosis at high doses during chronic administration in two animal species.

Oral reproductive studies in the rat have shown a decrease in ovulations and inhibition of implantations and embryotoxic effects (increase in resorptions) at maternotoxic dose levels of 1mg/kg and higher. Studies of toxicity on reproduction in rats and rabbits did not reveal teratogenicity up to oral doses of 4 mg/kg in rats and 80 mg/kg in rabbits.

The affected dose levels exceeded the clinical dose (7.5 - 15 mg) by a factor of 10 to 5-fold on a mg/kg dose basis (75 kg person). Fetotoxic effects at the end of gestation, shared by all prostaglandin synthesis inhibitors, have been described. No evidence has been found of any mutagenic effect, either in vitro or in vivo. No carcinogenic risk has been found in the rat and mouse at doses far higher than those used clinically.

6 PHARMACEUTICAL PARTICULARS

6.1 List of excipients

Sodium citrate

Lactose monohydrate

Microcrystalline cellulose

Crospovidone

Anhydrous colloidal silica

Magnesium stearate

6.2 Incompatibilities

Not applicable.

6.3 Shelf life

3 years.

6.4 Special precautions for storage

This medicinal product does not require any special storage conditions.

6.5 Nature and contents of container

PVC/PVDC/aluminium blister, packs of 1, 2, 7, 10, 14, 15, 20, 28, 30, 50, 60, 100, 140, 280, 300, 500 or 1000 tablets.

Not all pack sizes may be marketed.

6.6 Special precautions for disposal

No special requirements.

7 MARKETING AUTHORISATION HOLDER

Ipca Laboratories UK Limited
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United Kingdom

8 MARKETING AUTHORISATION NUMBER(S)

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