

Ibuprofen

Ima Student

PSY630 Psychopharmacology

Professor Smith

8/25/20XX

Note to student: This is a worked example paper for the “Rapid Review” assignments in Weeks Three, Four, and Five of PSY630: Psychopharmacology. Your paper does not need to (and probably should not) look just like this example paper. Depending on the drug you chose, your paper may be more complicated, involve more subsections, and cover different topics with more or less depth. This example paper is meant to give you a general idea of what to include and what depth of detail to use. Ask your instructor if you have any concerns.

Ibuprofen

General Description

Ibuprofen belongs to the larger class of drugs referred to as the non-steroidal anti-inflammatory drugs (NSAIDs) and also includes naproxen, aspirin, indomethacin and celecoxib, among others. Ibuprofen was chosen as a paper topic because of its' widespread over-the-counter (OTC) use. Ibuprofen has, as the name NSAID suggests, anti-inflammatory effects making it useful in a wide variety of disorders where the inflammatory response needs to be suppressed. Relatedly, it is also an analgesic, partly due to its' anti-inflammatory effect which is central to many disorders and injuries which cause pain, but also to a separate secondary mechanism which is poorly understood. It is also an anti-pyretic and useful for treating fever. Steroids also reduce inflammation; however they have a large number of broad side effects including immune-suppression which make NSAIDS like ibuprofen a better choice for many conditions. Ibuprofen and many other NSAIDs are also superior to aspirin in people allergic to aspirin and other salicylates (Atchinson, Herndon, & Rusie, 2013; Roda, Bagán, Soriano, & Romero, 2007).

Specific indications include: general relief of mild to moderate pain, menstrual pain, fever, rheumatoid arthritis, osteoarthritis, headache, migraine, dental pain. It sees use across a wide variety of medical conditions and procedures.

Mechanism of Action

Ibuprofen and the other NSAIDs reduce the production of prostaglandins. These substances are produced by injured tissues or tissues inflamed by some type of immune response. Specifically, ibuprofen inhibits the enzyme cyclooxygenase (COX). However, COX has more

than one form and is directly or indirectly involved in the activity of other biological processes producing a variety of side effects (Roda et al., 2007).

Dosage, Administration, Absorption, and Metabolism

Ibuprofen is administered by mouth, although rectal suppositories are available for those unable to swallow. The dose for an adult is 200-400mg three times daily for OTC use. Under medical supervision doses up to 800mg four times a day may be given. It is typically taken with food to avoid stomach upset. After being taken ibuprofen enters the bloodstream in about 30 minutes reaching its peak in 1-2 hours. It has a half-life of around 2 hours. After first pass metabolism it has a bio-availability of 80% and is 99% plasma bound. Its two inactive metabolites are excreted by the kidneys (Blondell, Azadfard & Wisniewski, 2013; Roda et al., 2007), making health kidney function very important to use this drug safely.

Side Effects and Contraindications

Because ibuprofen inhibits the COX enzyme it also interferes with blood clotting and functions of the gastrointestinal tract. The primary side effects of ibuprofen are gastric upset occasionally leading to ulcer with long term use. There is some risk of bleeding, especially for those with a history of bleeding disorders or about to undergo a surgical procedure. Kidney damage has also been reported. As with many drugs these side effects are linked to the dosage involved and the length of use (Blondell, Azadfard & Wisniewski, 2013; Conaghan, 2012; Roda et al., 2007).

Other reported but fairly rare side effects include: headache, dizziness, sleepiness, fatigue, ringing in the ears, changes in vision, rash, sun sensitivity, sweating, dry mouth, constipation, diarrhea, flatulence, painful urination, increased menstrual bleeding, altered blood count, bone marrow depression, shortness of breath, coughing blood, runny nose, hypertension,

stroke and heart attack. There is some indication that ibuprofen may be implicated in miscarriages, rhabdomyolysis, and erectile dysfunction (Atchinson, Herndon, Rusie, 2013; Blondell, Azadfar & Wisniewski, 2013; Conaghan, 2012; Roda et al., 2007).

This drug should be used with care in the elderly or very young, people with bleeding disorders or a history of ulcers. The drug should not be taken with other NSAIDs or with steroids. Drug interactions include: lithium, some diuretics, beta-blockers, and selective serotonin reuptake inhibitors. The patient should also avoid alcohol because of the risk of stomach irritation as well as steroids due to the risk of stomach ulcers. People with a previous sensitivity to any NSAID should avoid ibuprofen. Ibuprofen does cross the placental barrier and enters breast milk and should be used by pregnant or nursing mothers only under medical advice (Blondell, Azadfar & Wisniewski, 2013; Conaghan, 2012; Roda et al., 2007).

Overdose

Since being introduced as an OTC drug overdose has become more common. Occasionally this is due to intent, however, it typically appears to be more often the result of casual use or inadvertent overdose by combining several OTC products with the patient being unaware that they all contained ibuprofen. Symptoms of overdose typically include: abdominal pain, nausea, vomiting, headache, tinnitus and drowsiness. In more severe cases gastrointestinal bleeding, seizures, low blood pressure, acidosis, irregular heartbeat, coma, kidney failure and respiratory depression can occur. Treatment for overdose includes emptying the stomach, intestinal irrigation, IV fluids and monitoring. Overdose is occasionally fatal and intensive care may be needed (Conaghan, 2012).

Other Notes

Ibuprofen is often combined with other analgesics that do not fall into the NSAID class such as acetaminophen. It is sometimes used in conjunction with opiate drugs like codeine to reduce the amount of opiate needed to relieve pain (Blondell, Azadfard, & Wisniewski, 2013). Consumers need to check OTC medication labels and avoid combining ibuprofen with other OTC medications because ibuprofen or other NSAIDs are found in many OTC preparations.

Concluding Remarks

Despite the extensive list of side effects and contraindications ibuprofen is a popular and safe medication for the everyday aches, pains, and injuries of life. However, like all medications, it needs to be used wisely. In particular knowing the medical history of the patient, avoiding other interacting drugs and limiting the dose and length of use will prevent the vast majority of issues.

References

- Atchinson, J. W., Herndon, C. M., & Rusie, E. (2013). NSAIDs for musculoskeletal pain management: Current perspectives and novel strategies to improve safety [Supplemental material]. *Journal of Managed Care & Specialty Pharmacy*, *19*(9), S3-S19.
- Blondell, R. D., Azadfar, M., & Wisniewski, A. M. (2013, June 1). Pharmacologic therapy for acute pain. *American Family Physician*, *87*(11), 766-772.
- Conaghan, P. G. (2012). A turbulent decade for NSAIDs: Update on current concepts of classification, epidemiology, comparative efficacy, and toxicity. *Rheumatology International*, *32*(6), 1491-1502. doi: 10.1007/s00296-011-2263-6
- Roda, R. P., Bagán, J. V., Soriano, Y. J., & Romero, L. G. (2007). Use of non-steroidal anti-inflammatory drugs in dental practice. A review (English). *Medicina Oral, Patología Oral, Cirugía Bucal*, *12*, E10-18.