Errors of Self Medication By NSAIDS

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ABSTRACT
This article presents a review on self medication, which can be defined as the use of medicine without any professional supervision. It aims to find the reason of self medication and make public aware about its effects and side effects. People use it for the treatment of any disease symptoms or minor ailments by their self initiative. The most commonly available OTC medications are pain killers, cough and cold remedies, anti-allergy medicines. Although these medications are considered risk free and useful for the treatment of common health problems, their excessive use can also lead to serious side effects and unfavorable reactions. The percentage of self medication might be changes with locality and region. Many of the national and international journals on the self medication were reviewed for their findings and report on different parameters. There are several drug stores, which provide the medicine without any prescription and its percentage is increasing day to day in India. Presently the frequency is high of self medication by the young ones and literate people who do not have much time to go to physician. This review conclude the benefit (when drug is used in limit and its use, characteristics are known), drawback (when people have no idea about its use and limitations) of drugs and their safe use.

Keywords:- Self medication, NSAIDs, effects, public health & Awareness, treatment

INTRODUCTION
Self medication is a major form of self-care. It involves the use of medicinal products by the consumer to treat self recognized disorder, symptoms, recurrent disease or minor health problems. It is independent of age for both males and females. Medicines for self medication are often called Over the Counter (OTC) drug, which are available without a Doctors prescription through pharmacies, mostly in the less developed countries.
Recent development of the pharmaceutical companies contribute to a wide spread availability of OTC Medicine. There is also the potential for misuse and abuse of such products. A major problem of self medication with antimicrobials is the emergence of human pathogens resistance world wide particularly in
developing countries, where antibiotics are often available without a prescription. Its irrational use increases the risk of adverse events, bacterial infection, Hypersensitivity, drug withdrawal symptom and of masking disease which can delay correct diagnosis. Self medication is a global problem, 47.6% prevalence of self medication has been reported among the infant in Nigeria.

Self medication particularly with antibiotics has been widely reported leading the WHO to call attention to the dangers of self medication as a cause of antibiotic resistance. In country like India there is a wide range of drugs coupled with inadequate health service result in increase proportion of drug used as a self medication compared to prescribed drugs.

WHY DO PEOPLE USE SELF MEDICATION?

According to a report the reason for self medication, given in fig.1

Male (35.48%) and female (15.56%) used Self Medication due to the lack of time, 32.26% male and 26.67% female used self medication due to High consultant Fee of Physician, 29.03% male and 11.11% female wants Quick relief, 3.33 % male and 24.44% female believe in Ayurveda, There are some cases of female (6.67%) in which there is no family support hence they uses self medication, 15.56% female used self medication due to unable to walk.

There are some other reasons like wider availability of medicine, greater choice of treatments, ease of access, an active role in his/ her own health care.

Fig.1: Reason for self medication

![Figure 1: Reason for self medication](image)

<table>
<thead>
<tr>
<th>% male</th>
<th>% female</th>
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<tr>
<td>Lack of time</td>
<td>High consultant Fee</td>
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<td>40%</td>
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**Fig-1 Broad therapeutic classes of OTC medication**

- Analgesics and antipyretics
- Cold, cough, and allergy products
- Nighttime sleep-aids
- Gastrointestinal products
- Dermatological products
- Other topical products (including dermal and vaginal antifungals, head lice products, hair loss products, and otics)
- Ophthalmic products
- Oral health care products
- Menstrual products
- Nicotine replacement products
- Weight loss aids
- Vaginal contraceptives and emergency contraceptives
Female individuals are more likely to use OTC medications. In a 2002 survey, 87% of women reported the use of an OTC pain medication in the past year compared to 80% of men. A study conducted in 2011 confirmed that OTC medications are American’s most popular treatment choice for common ailments such as headache, heartburn, allergies, and colds. *(See Figure 2)*

![Figure-2 Percentages of Individuals Who Treated a Condition With OTC Products Only](n=1,880; January 2011)

**EFFECTS OF SELF MEDICATION**

**Advantages**

Expected health benefit from self medication depends on perceived effectiveness of self medication.

Responsible self medication can:

1. Help to prevent and treat symptoms and ailments that do not require a doctor.
2. Reduce the pressure on medical services where health care personnel are insufficient.
3. Increase the availability of health care to populations living in rural or remote areas.
4. Enable patients to control their own chronic conditions.

These benefits translate into patient and consumer wellness and productivity, economic gain for employers, and cost savings to healthcare budgets through reduced medicine budget cost and reduced physician visits but the user should know how to take or use the drugs; the effects and possible side; possible interactions with other drugs is known by the user; duration of the course of the drugs is known by the user.

**Disadvantages**

Modern medicine have become absorbed rapidly in to the local custom through out the world, their ubiquitous distribution, powerful marketing and poor control mean that they are used and misused for a wide range of applications. Misuse is defined as using an OTC product for a legitimate medical reason but in higher doses or for a longer period than recommended.

Taking more of a painkiller than recommended to treat a headache. Reports have proven that Paracetamol, an antipyretic and analgesic in large doses can cause liver failure.

**Side Effects of Self Medication**

OTC drugs can cause partial ototoxicity like amino glycosides.

Regular use of NSAIDs drugs can interfere with ovulation & affect the fertility.
OTC drugs may cause skin reactions and hypersensitivity to consumer. There are so many examples which shows that improper use of OTC drugs can cause severe dangerous effects to the human health.

**SELF MEDICATION WITH ANALGESICS**

Pain medicines are also called analgesics. Each kind of pain medicine has benefits and risks. Over-the-counter means you can buy these medicines without a prescription. The most common types of medicines are acetaminophen and NSAIDs.

Recently there has been growing concern about their dangers. As a result, the FDA has begun tightening rules about warning labels and maximum doses. The FDA is also considering banning some prescription drugs that contain acetaminophen, which is the active ingredient in some over-the-counter pain relievers.

**Nonsteroidal anti-inflammatory drugs**, usually abbreviated to **NSAIDs**—are a class of drugs that provides analgesic (pain-killing) and antipyretic (fever-reducing) effects, and, in higher doses, anti-inflammatory effects.

The term *nonsteroidal* distinguishes these drugs from steroids, they are non-narcotic and thus are used as a non-addictive alternative to narcotics.

**Medical Uses of NSAIDs**

NSAIDs are usually used for the treatment of acute or chronic conditions where pain and inflammation are present.

- NSAIDs are used for the symptomatic relief of the following conditions:
  - Osteoarthritis
  - Rheumatoid arthritis
  - Mild-to-moderate pain due to inflammation and tissue injury
  - Low back pain
  - Inflammatory arthropathies
  - Headache
  - Migraine
  - Acute gout
  - Dysmenorrhoea
  - Metastatic bone pain
  - Postoperative pain
  - Pyrexia
  - Ileus
  - Renal colic
Types of NSAIDS

NSAIDs are based on their chemical structure:

Propionic acid derivatives - Examples include: Ibuprofen, Naproxen, Fenoprofen, Ketoprofen, Flurbiprofen,

Acetic acid derivatives - Examples include: Indomethacin, Sulindac, Etodolac, Diclofenac (Safety alert by FDA)

Enolic acid (Oxicam) derivatives - Examples include: Piroxicam, Meloxicam, Tenoxicam, Droxicam

Fenamic acid derivatives - Examples include: Mefenamic acid, Meclofenamic acid, Flufenamic acid, Tolfenamic acid

Selective COX-2 inhibitors (Coxibs) - Examples include: Celecoxib (FDA alert), Rofecoxib (withdrawn from market), Etoricoxib (FDA withdrawn)

How do NSAIDs work:

NSAIDs inhibit the activity of both cyclooxygenase-1 (COX-1) and cyclooxygenase-2 (COX-2), and thereby, the synthesis of prostaglandins and thromboxanes. It is thought that inhibiting COX-2 leads to the anti-inflammatory, analgesic and antipyretic effects and that those NSAIDs also inhibiting COX-1, particularly aspirin, may cause gastrointestinal bleeding and ulcers. For this reason, the advantages of COX-2 selective inhibitors may be indicated.

Pharmacokinetics

Most nonsteroidal anti-inflammatory drugs are weak acids, with a pKa of 3-5. They are absorbed well from the stomach and intestinal mucosa. They are highly protein-bound in plasma (typically >95%), usually to albumin, so that their volume of distribution typically approximates to plasma volume. Most NSAIDs are metabolised in the liver by oxidation and conjugation to inactive metabolites that typically are excreted in the urine, though some drugs are partially excreted in bile. Metabolism may be abnormal in certain disease states, and accumulation may occur even with normal dosage.

Ibuprofen and diclofenac have short half-lives (2–3 hours). Some NSAIDs (typically oxicams) have very long half-lives (e.g. 20–60 hour).

Factors to consider/ Contraindications

Some patients may be more at risk of developing side effects after taking NSAIDs than others. In fact, there are possible side effects for anybody who takes them.

Stomach and intestinal side-effects - NSAIDs can cause such gastrointestinal problems as stomach ulcers or indigestion. The following groups of people may be at higher risk of developing gastrointestinal problems when taking NSAIDs:

- Elderly individuals (aged over 65 years)
- Heavy smokers
Patients who are taking other medications at the same time
Patients who have a history of gastrointestinal problems
Patients who take NSAIDs long term and in high doses

**Cardiovascular and kidney side effects** - in some cases, NSAIDs may raise the risk of problems for the kidneys, heart or blood vessels. The following groups of people have a higher risk of these types of side effects when taking NSAIDs:

- Elderly patients (aged over 65 years)
- Patients with hypertension (high blood pressure)
- People with faulty/damaged hearts or kidneys
- People with kidney or heart failure

**Pregnancy** - women who are pregnant, and those planning to become pregnant should avoid NSAIDs. There is a health risk to both the mother and the baby. During the first and second trimesters of pregnancy, taking NSAIDs poses a very small risk for the baby's health; during the third trimester there is a risk the baby may develop pulmonary hypertension.

**Fertility** - some people may find it harder to conceive when taking NSAIDs. Experts advise such people to use other painkillers, such as acetimophen (paracetamol) if they are trying to have a baby.

**Breastfeeding** - breastfeeding mothers should avoid NSAIDs, even though the risk to the child is very small, says the National Health Service (NHS), UK. The NHS adds that if an NSAID is prescribed to a nursing mother, it is usually a very low dose.

**Asthma** - there is a risk symptoms may worsen if asthma patients take NSAIDs. It is recommended that asthma patients try to avoid them. In some cases, doctors may prescribe an NSAID for asthma patients if they are deemed to be beneficial; in such cases it will be a short course of medication.

**Post-surgery bleeding** - there is a risk of excessive bleeding after surgery or a traumatic injury if the patient takes NSAIDs.

**Combinational risk**

**Cardiovascular**

NSAIDs aside from aspirin, both newer selective COX-2 inhibitors and traditional anti-inflammatories, increase the risk of myocardial infarction and stroke. They are not recommended in those who have had a previous heart attack as they increase the risk of death and/or recurrent MI.

NSAIDs aside from (low-dose) aspirin are associated with a doubled risk of heart failure in people without a history of cardiac disease. In people with such a history, use of NSAIDs (aside from low-dose aspirin) was associated with a more than 10-fold increase in heart failure.

**Possible Erectile Dysfunction Risk**

A 2005 Finnish study linked long term (over 3 months) use of NSAIDs with an increased risk of erectile dysfunction. This study was correlational only, and depended solely on self-reports.
A 2011 publication in the Journal of Urology received widespread publicity. According to this study, men who used NSAIDs regularly were at significantly increased risk of erectile dysfunction.

**Gastrointestinal**
The main adverse drug reactions associated with NSAID use relate to direct and indirect irritation of the gastrointestinal (GI) tract. Common gastrointestinal problems include:
- Nausea/Vomiting
- Dyspepsia
- Gastric ulceration/bleeding
- Diarrhea
- Renal

NSAIDs are also associated with a relatively high incidence of renal adverse drug reactions (ADR). The mechanism of these renal ADRs is due to changes in renal haemodynamics (kidney blood flow).

NSAIDs cause unopposed constriction of the afferent arteriole and decreased renal perfusion pressure.

Common ADRs associated with altered renal function include:
- Salt and fluid retention
- Hypertension
- In rarer instances NSAIDs may also cause more severe renal conditions:
  - Interstitial nephritis
  - Nephrotic syndrome
  - Acute renal failure
  - Acute tubular necrosis
  - Photosensitivity

Photosensitivity is a commonly overlooked adverse effect of many of the NSAIDs. The 2-arylpropionic acids are the most likely to produce photosensitivity reactions, but other NSAIDs have also been implicated including piroxicam, diclofenac and benzydamine.

**During Pregnancy**
NSAIDs are not recommended during pregnancy, particularly during the third trimester. While NSAIDs as a class are not direct teratogens, they may cause premature closure of the fetal ductus arteriosus and renal ADRs in the fetus. Additionally, they are linked with premature birth and miscarriage. In contrast, paracetamol is regarded as being safe and well-tolerated during pregnancy, but Leffers et al. released a study in 2010 indicating that there may be associated male infertility in the unborn.

In France, the country's health agency contraindicates the use of NSAIDs, including aspirin, after the sixth month of pregnancy. Other Common adverse drug reactions (ADR), other than listed above, include: raised liver enzymes, headache, dizziness. Uncommon ADRs include: hyperkalaemia, confusion, bronchospasm,
rash. Rapid and severe swelling of the face and/or body. Ibuprofen may also rarely cause irritable bowel syndrome symptoms.

Most NSAIDs penetrate poorly into the central nervous system (CNS). However, the COX enzymes are expressed constitutively in some areas of the CNS, meaning that even limited penetration may cause adverse effects such as somnolence and dizziness.

In very rare cases, ibuprofen can cause aseptic meningitis.

**Drug Interactions**

NSAIDs reduce renal blood flow and thereby decrease the efficacy of diuretics, and inhibit the elimination of lithium and methotrexate.

NSAIDs cause hypocoagulability, which may be serious when combined with other drugs that also decrease blood clotting, such as warfarin.

NSAIDs may aggravate hypertension and thereby antagonize the effect of antihypertensives, such as ACE Inhibitors.

NSAIDs may interfere and reduce efficiency of antidepressants.

**NSAID interactions with alcohol** - in most cases a man can consume 3 to 4 units of alcohol per day, and a woman 2 to 3 units per day, while taking ibuprofen or aspirin. If more than this alcohol is consumed in higher amounts, there is a risk of irritation to the stomach lining and bleeding in the stomach.

**NSAIDs side effects?**

NSAIDs are very effective for a wide range of conditions. Patients and health care professionals must not forget, however, that most drugs carry a risk of some side effects. Although rare, NSAID side effects may be serious.

The most common NSAID side effects include:

**Long-term use -**

**Dyspepsia** - also known as indigestion or upset stomach; it is not a disease. It is a group of symptoms which often include bloating, nausea and burping.

**Stomach ulcers** - these may eventually result in the following complications.

A hole in the wall of the stomach or intestines

Anemia - when the number of red blood cells or concentrations of hemoglobin are low a person is said to have anemia.

Gastrointestinal bleeding

Complications in patients with an existing cardiovascular condition:

Heart attack

Heart failure

Hypertension
Liver and kidneys - in very rare cases, and then only in patients with existing liver or kidney conditions, the medication may affect the liver or kidneys.

Avidenses

A RECENT report says that taking over-the-counter tablets for everyday aches and pains could do more harm than good. Jane Symons investigates

By: Jane Symons

Published: Tuesday, November 5, 2013

Painkillers may have dangerous side effects or react with other medication

According to a recent survey six out of 10 people who suffer regular aches and pains rely on over-the-counter painkillers to get them through the day. But many are putting their health at risk because long-term use can be deadly.

A report from health watchdog NICE warns of a “very definite trend” linking paracetamol to heart attacks, strokes, kidney failure and gastric problems and says it should be used at the lowest effective dose for the shortest possible time.

It also states to “use cautiously in combination with oral NSAIDs (non-steroidal anti-inflammatory drugs)”. NSAIDs, such as aspirin, ibuprofen and naproxen, are known to cause gastric bleeding and experts at Oxford University estimate they are responsible for 12,000 hospital admissions and 2,500 deaths every year.

SAFE USE OF SELF MEDICATION

Safety in self medication depends on four parameters.

1. Drug: Its inherent properties, dose and duration of use, including its power to induce dependence.
2. Formulation: devised with unsupervised use in mind, e.g. low dose.
3. Information: available with all purchases (printed) and rigorously reviewed (by panels of potential users) for user friendliness and adequacy for a wide range of education and intellectual capacity.
4. Patient compliance.

CONCLUSION

Several research papers show that self medication is a global phenomenon. This review focused on the self medication of the OTC drugs, their use, its safety and reason for using it. It would be safe, if the people who are using it, have sufficient knowledge about it’s Dose, time of intake, side effect on over dose, but due to lack of information it can cause serious effects like skin problem, hypersensitivity and allergy. With increasing the literacy, the demand of self medication also increasing day by day. The ratio of literate people who are using the self medication is high as compared to that of illiterate people.
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