

Short Commentary

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Editorial on Side Effects Used as Therapeutic Therapy of Certain Medications

Sadique Hussain^{1*}, Swati Tyagi² and Gurleen Kaur³

¹School of Pharmaceutical Sciences, Jaipur National University, Jagatpura, Jaipur, Rajasthan 302017, India

²Quantum School of Health Sciences, Department of Pharmacy, Quantum University, Roorkee, Uttarakhand 247662, India

³School of Pharmaceutical Sciences, Lovely Professional University, Phagwara, Punjab 144411, India

*Corresponding author

Sadique Hussain, School of Pharmaceutical Sciences, Jaipur National University, Jagatpura, Jaipur, Rajasthan 302017, India.

Email: sadiquehussain007@gmail.com

Received: February 27, 2022; **Accepted:** March 07, 2022; **Published:** March 31, 2022

Man has suffered from diseases of all kinds since the beginning of human life several millennia or centuries ago. Uncountable illnesses, both those that science can easily explain and those that to date are inexplicable, have affected, killed, and weakened many from antiquity till now. In man's attempt to be productive and avoid morbidity, numerous products and substances have been used to mitigate, treat, or cure diseases. Additionally, other substances that promote good health and well-being have been used and continue to be used by men to help avoid or prevent some sicknesses. The products or substances that have been used for diagnosis, management, treatment, and prevention of diseases are termed medicines or drugs. These terms (medicine and drugs) are mostly used interchangeably, except that medicine can also refer to practice – the practice of healing [1].

Just as there are numerous diseases so are numerous medicinal products or drugs used in their management and/or treatment. Many methods of classification of drugs are used; some are based on the chemical nature of the active ingredient(s) and others, how the drugs are used to treat specific disease conditions [2]. Common groups of drugs include analgesics for relief pain; antimicrobials used to treat infections; anti-hypertensives and anti-diabetics for management of hypertension and diabetes respectively. There are also stimulants and depressants [3].

Drugs do not always give only the useful effects they are expected to render. Their administration sometimes comes with side effects, adverse drug events (ADE), or adverse drug reaction (ADR). The World Health Organization (WHO) defines ADE as “any untoward medical occurrence that may present during treatment with a pharmaceutical product, but which does not necessarily have a causal relationship with this treatment”. It also defines ADR as “a response to a drug which is noxious and unintended, and which occurs at doses normally used in man for prophylaxis, diagnosis, or therapy of disease or the modification of physiologic function” [4].

For most drugs, the side effects are minor, causing just a little inconvenience such as little nausea or mild gastrointestinal

disturbances, normally for oral medications, or slight skin irritation for topical products. Additionally, for most drugs, with proper dosing, there will not be any noticeable side effects. There is also a section of the population who may be allergic to some drugs that many users tolerate without problems. Such allergic reactions may differ from individual to individual, ranging from itching and general rashes to a more serious condition like anaphylactic shock [5]. Unwanted effects of drugs can result from the administered drug alone, or concomitant administration with other products such as other drugs, herbal products, food supplements, or the food itself. Specific drugs may have unique side effects and adverse effects, and some drugs present serious ADRs which may include death, congenital deformities, permanent damage to organs of the body, and other complex complications [6]. For example, the corticosteroids such as dexamethasone and prednisolone normally used to treat or manage allergic reactions, some inflammatory conditions, and some types of cancers, can have serious adverse effects when used at high doses or for a prolonged period. Such effects include high sugar levels in the blood which can worsen diabetes, fluid, and some salts retention leading to swelling [7]. The use of most chemotherapeutic agents, such as methotrexate, in the management of different types of cancers, are also associated with severe side effects such as bone marrow suppression, loss of hair (alopecia), fetal death and congenital deformities, and tumor lysis syndrome [8]. Often drug regulatory bodies in various countries, such as the Food and Drugs Administration (FDA) in the United States of America, ensure that drugs that come into the market have the claimed therapeutic activities and additionally are deemed safe. This is achieved through extensive and detailed clinical trials before the release of the drug to the market. However, not all side effects, and even sometimes the indications of the drug, are known during clinical trials. Most regulatory agencies and other bodies encourage post-marketing surveillance programs on drugs for healthcare professionals and individuals to report any adverse or side effects of the drug. From 2011 to mid-2017, the FDA received more than 5.4 million reports of prescription drug adverse events, including more than 1 million deaths [9]. Interestingly, not all side effects of drugs are unwelcome; some are useful and in fact

in some cases that effect takes over the actual indication(s) of the drugs in some areas or localities and among some people. A typical example of a drug whose other effect is now being used extensively is Tramadol. Tramadol is an opiate analgesic used in the management of moderate to moderately severe pains. It is a synthetic analogue of neither codeine that binds to opiate receptors and inhibits norepinephrine and serotonin reuptake [10]. The BNF reports malaise as a common side effect of Tramadol, with diarrhea, flatulence, gastritis as uncommon side effects; it further reports that rarely the drug can cause hypertension, anorexia, anxiety, abnormal coordination, bronchospasm, and seizures [8]. However, the recent use of Tramadol among many young men in some countries is its ability to prevent premature ejaculation; a situation where a male ejaculates with minimal sexual arousal before or shortly after vaginal penetration, typically lasting less than 2 minutes. Here the person discharges the semen before he wishes to do so. The use of Tramadol to prolong ejaculation has been corroborated by many studies, that the drug has impressive results in delaying ejaculation [11,12].

Another drug whose other effects are more widely used perhaps than the main indication is cyproheptadine. Cyproheptadine is an antihistamine drug used in the management of histamine-associated symptoms such as runny nose, watery eyes, pruritis, etc. It mainly works by antagonizing the activities of histamine on HA-receptors, thereby causing a reduction in undesirable indications brought about by the histamine HA-receptor binding. This drug has the additional effect of being able to stimulate appetite, and this use supersedes its anti-allergic activities, at least in Africa [13]. In Ghana, for example, there are many brands of cyproheptadine-containing preparations that serve as appetite-stimulating haematinics; haematinic because in most cases other minerals and vitamins enhance erythropoiesis (blood formation) have been incorporated. These over-the-counter appetite-stimulating products are highly patronized in the market. Metformin, a biguanide, is principally an anti-hyperglycaemic agent that improves glucose intolerance in patients with Type II Diabetes, where it lowers both basal and postprandial plasma glucose concentrations. One use of metformin, though unlicensed for that purpose according to the BNF, is its use in the treatment of polycystic ovary syndrome (PCOS). PCOS is a condition that embraces a broad spectrum of signs and symptoms of ovary dysfunction with fundamental features of hyperandrogenism and polycystic ovary morphology [14]. Metformin has become a therapy for PCOS which results in weight reduction, improvement in insulin resistance, restoration of normal ovulatory cycles, increase in fertility, decrease in hyperandrogenism, decrease in the rate of spontaneous abortions, and decrease in the risk of gestational diabetes mellitus [15].

In the research and development of drugs a product developed for a particular indication sometimes end up being used for a different condition. An example of such a drug is minoxidil which is used to stimulate hair growth and slow balding. This drug was originally launched in 1979 for the treatment of hypertension [16]. Currently, there are many over-the-counter topical preparations containing minoxidil for the treatment of baldness [17]. Another example of a drug whose initial indication changed is Sildenafil (Viagra). Viagra was designed for the treatment of angina but was not very successful for that purpose during trials. However, many male users reported dramatic improvement in penile erection during the clinical trials [18]. Today Sildenafil is an enormous hit in the management of erectile dysfunction, and that is the current indication. Drugs are very useful products that have saved humanity from premature death and weakness in several ways. Whilst they sometimes come with unwanted effects which in fact in most cases

are transient, there are instances they offer additional useful effects which are unreported. And this is where individuals experiencing any off-label effect, be it positive or negative, are encouraged to report to designated agencies for proper investigation. Indeed, through such reports and investigations, there may be some other serendipitous discoveries from existing drugs [19].

Competing Interests

None

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