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Possibility of potential herbal-drug interactions in elderly population

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ABSTRACT

Medicines are variable in composition and quality, which may have an impact on their interaction profile still as a result of the reliability of reports regarding them. As such, the potential for herb-drug interactions increases in elderly population. For this instance we conducted a survey based study in which 208 patients were surveyed belonging to different areas of Karachi. These people were of different age groups ranging from 40-60 years old. They were asked to answer a face to face questionnaire based on the concurrent use of the conventional medicine and herbal drugs and their possible interaction based side effects. Our results shows that out of 208, 124(59.6%) volunteers prefer treatment with herbal and allopathic medicines, 138 (66.3%) use medications on daily basis while 70 (33.7%) don't use on daily basis. And 56 volunteers were at high risk of potential herb-drug interaction, among them 32.7% have dynamic interactions and 21.2% have kinetic interactions in their medication regime. Out of 208 volunteers 89% were experiencing adverse effects (self reported). Since a significant number of herb-drug interactions were detected in elderly patients, it is suggested that health care professionals and consumers should be aware of the potential herb-drug interactions and health care professionals should question and advice their patients on their use of herbal medicines.

Keywords: Xanthium, Asteraceae, *Xanthium strumarium*, *Xanthium spinosum*.

INTRODUCTION

Herbal medicines refer to the use of plants for the promotion of healing and maintenance of health. It is said that the use of herbal medicines originated in Egypt back in 1550 BC, yet many of their pharmacological effects remain poorly understood. Out of the estimated 800,000 plant species on Earth^[1], about a quarter have been categorized and only a small fraction of these have been examined for pharmacological efficacy^[2].

The popularity of herbal medicinal product makes it necessary to know potential interactions between herbs and pharmaceuticals. The probability of herb-drug interactions can be higher than drug-drug interactions, if solely usually medication typically contain single chemical entities, whereas most herbal medicinal product (even single-herb products) contain mixtures of pharmacologically active constituents^[3]. Herbal drugs chemical constituents responsible for medicine activities are several and complicated, and also the majority of them haven't been known. On the other hand, herbal medicines are usually used as mixtures of two or more plants with totally different herbal ingredients specific to each one. Additionally to the chemical complexity of herbal medicines, several patients take these "natural" products concomitantly with medication prescribed by their physicians. For these reasons, there's a serious issue in determining the clinical pharmacokinetic and Pharmacodynamic effects once herbal medicines are concerned. There's no doubt that there's potential for herbal medicine to interact adversely with prescription medicines, with risk of injury and even death^[4].

The herb-drug interactions may involve having an herb component cause either an increase or decrease in the amount of drug in the blood stream, either by altering the ADME (kinetic interaction) of a drug and by antagonizing or synergism (dynamic interaction) of the effects of a drug^[5]. As a general rule, elderly population is more likely to use both conventional and herbal medicines. This population also possesses a higher incidence of chronic disease, which requires the use of progressively advanced typical drug therapy. As such, the potential for herb-drug interactions increases in elderly population^[5, 6]. The aim of this cross sectional studies is to assess the evidence on interactions between Herbal drugs and Conventional drugs in elderly population.

METHODOLOGY

This study is based on survey conducted between September and November, 2015 with 208 different patients who give response to participate in the study. These patients belong to different areas of Karachi. They were directly asked to answer a questionnaire based on the concurrent use of the

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conventional medicine and herbal drugs and their possible side effects that may experienced. The purpose of the study was explained and each patient was questioned on socio-demographical characteristics, disease condition and medicines used [7]. The interactions were checked with the help of a software [6]. The selection criteria was random and total number of sample gathered was 230 out of which 22 patients were excluded and 208 patients were included on the basis of use of herbal and conventional drugs concurrent use.

RESULTS AND DISCUSSION

Herbal medicines have become a popular form of therapy. They are often perceived as being natural and therefore harmless [8]. Herb-drug interactions occur but are under-researched [3]. This cross sectional study has been conducted to determine the potential of herb-drug interaction in elderly patients of different age groups ranging from 40-45, 46-50, 51-55 and 56-60 years old and find out that the age ranging between 56-60 year old have more potential risk of interactions. Two hundred and eight patients were surveyed having different co morbidities, out of which 59.6% volunteers prefer herbal and allopathic medicines both, there is 53.8% potential risk of occurrence of herbal drug interaction. The number of dynamic interactions was seen in 32.7% of patients, while 21.2% individuals have kinetic interactions. Among Two hundred and eight surveyed patients, 138 patients use medications on daily basis(which have 66.3% chances of potential interaction) while the remaining 70 patients do not use medications on daily basis which have 33.7% chances of potential interaction. By this study we have found that out of two hundred and eight patients, 9.6% volunteers prefer herbal medicines, 4.8% volunteers prefer homeopathic medicines, 17.3% volunteers allopathic medicine, 8.7% volunteers prefer herbal and homeopathic medicines and 59.6% volunteers prefer herbal and allopathic medicines both (Figure #1). It shows that most of the patients prefer combination of allopathic and herbal medicines. Taking herbs with therapeutic drugs increases the risk of potential herb drug interaction, and may lead to serious clinical consequences [9]. The increase use of herbs by older patients has added more complexity to the problems drawn by polypharmacy in adults [10].

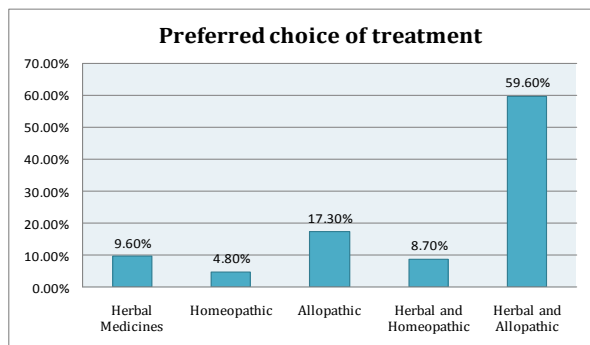


Figure 1: Different choices of treatment by elderly patients

In our study the risk of occurrence of potential herbal drug interaction among 208 volunteers is 53.8% and interestingly 49.5% of them complained different adverse effect experienced while 46.2% volunteers were safe from herb-drug interactions. Unfortunately, this happens despite ample proof that herbals will dramatically amendment the disposition and action of some often prescribed or essential medications, generally with profound adverse consequences [11].

Of the one hundred and four patients, 32.7% have occurrence of dynamic interactions, 21.2% have occurrence of kinetic interactions while 46.2% have occurrence of no interactions (Figure 2). It is seen that herbal medicines when taken with allopathic drugs may produce synergistic or antagonistic effects that is dynamic interactions relates to the site of the action of a drug and sometimes they alters the processes of absorption, distribution, metabolism or elimination of the drug that is kinetic interactions. Several herbal drugs may act as inducers or inhibitors of CYP-iso-enzymes or P-glycoprotein when

co-administered with prescription drugs results in interaction [12, 13]. Among 33.7% volunteers of 40-45 age groups 16.3% have occurrence of potential herbal drug interactions, among 28.8% volunteers of 46-50 age group, 11.5% have occurrence of potential drug interactions, among 60 volunteers of 51-55 age group 14.4% have occurrence of potential drug interactions, and among 18.3% volunteers of 56-60 age group 11.5% have occurrence of potential drug interactions. This shows that the age group of 56-60 years has highest risk of herbal drug interactions then other age groups, as patients of these ages have multiple chronic medical conditions requiring multiple drug therapies. The danger of associate adverse event attributable to drug-herbal interactions is considerably augmented once multiple medication area taken. Several medications ought to be used with special caution owing to age-related changes in pharmacokinetics (i.e., absorption, distribution, metabolism, and excretion) and pharmacodynamics (the physical effects of the drug) [14].

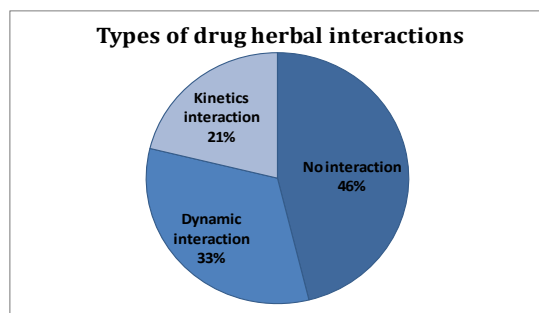


Figure 2: Types of drug herbal interactions found in elderly patients

In our study hypertension, arthritis, constipation, heart disease, diabetes and head ach/migraine issues were most common issues in older patients (Figure 3). Elderly patients with different co-morbidities are on usually polypharmacy, which is the use of variety of medicines at the same time and also the use of additional medicine to correct drug adverse effects, the actual fact that the elderly take a lot of medications for the treatment of many diseases makes them more at risk of the incidence of adverse reactions and increase the risk of clinically significant drug interactions [15, 16]. Since Herbal medicines are mixtures of more than one active ingredient. The use of multiple pharmacologically active compounds increases the chances of interactions taking place. Hence, the chance of herb-drug interactions is theoretically higher than drug-drug interactions, if solely because synthetic drugs usually contain single chemical entities [17]. Several herbs offer potential risk of certain adverse effects, the severity of adverse drug reactions regarding drug induced problems in the elderly patients and their association with poly pharmacy results in more relevant appearance of adverse reactions [18]. Thus, the risk of adverse effects is related to the number of medicines taken by the elderly patients that receive more medicines, sometimes inappropriately [18].

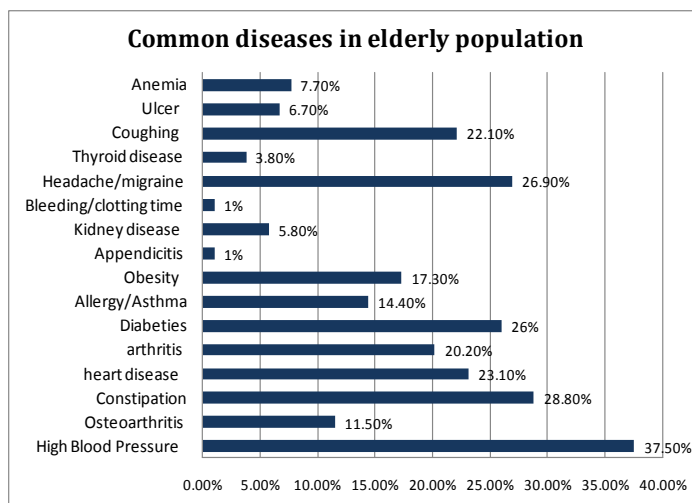


Figure 3: Common diseases encountered in elderly population

CONCLUSION

As herbs are considered as food products, manufacturers are not subject to the same regulation as conventional medicines and thought to be exempt from clinical safety and efficacy testing before the release of an herbal product and from any post marketing supervision. Although herbal medications are considered as being natural and thus safe, but co concurrent use with other medications it may have many adverse effects that can sometimes produce life-threatening consequences but use of herbal products should not be discouraged as sometimes herbal drugs are suitable alternative to conventional drugs. Its proper regulation from regulatory authorities and counseling by experts should be devised.

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