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Research Article

IMPORTANCE OF MEDICATION ADHERENCE IN ENSURING EFFECTIVE AND COST-EFFICIENT HEALTHCARE

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ABSTRACT

In simple terms, medication adherence signifies conforming to the recommendations given by the medical adviser as far as dosage, timing and frequency of medication are concerned. This review article aims at highlighting the various factors responsible for medication non-adherence and its impact on the global healthcare system. It analyses the various factors that contribute to medication adherence, or the lack of it, namely, the role played by the healthcare providers, outlook of the patients and their family members towards the medical condition and its treatment, and other related factors. The article also attempts to bring forth various suggestive measures which may help in eradicating a problem that has been vexing the healthcare systems, globally, for quite some time.

Keywords: Medication adherence, Cost-efficient, Effective healthcare.

INTRODUCTION

Non-adherence to medication has been cited by the World Health Organization ("WHO") as a global predicament with marked ramifications. It is no surprise therefore, that enhancement of medication adherence has assumed great importance insofar as healthcare professionals and policy makers are concerned [1].

In the terms of a layperson, 'medication adherence' alludes to compliance with the recommendations given by the consulting healthcare professional as far as dosages, timing and frequency of medication are concerned. In other words, adherence can be defined as the extent to which patients follow the instructions they are given for their prescribed treatments [2]. To elucidate with an example, a person with a chronic disease like hypertension is prescribed anti-hypertensive agents, depending upon the physiological conditions and the extent of the disorder – which are factors relevant for determining the timing, strength and frequency of doses which must be administered to the patient. Regardless of the clarity of communication between the patient and the provider, the ultimate onus lies on the patient to follow the prescribed regimen for the medical condition suffered from, and that is where the issue of medical adherence assumes great proportions, because it has substantial bearings upon the aggravation or alleviation of the disorder that the patient has been suffering from.

It is quite alarming to note that a large quantum of patients, both acute and chronic, fail to conform to the regimens set out for them by the concerned prescribing authorities.

A multitude of factors, inter-related in more ways than one, contribute to this medication non-adherence. They are, namely, disease-related, treatment-related, health-care system related, patient-related, and related to the prevalent socio-economic scenario of the particular region. Therefore, it is worth examining the causes of non-compliance to medication, before we study the effects further.

An Overview of the Vexations Relating to Medication Adherence

Medical non-adherence can be manifested in a number of ways – initial failure to fill a prescription, failure to fill a prescription as directed, omission of doses, taking more than the prescribed amount of medication, premature discontinuation of medication, wrong timing of dosages, taking medication prescribed for another individual, taking a dose with prohibited diet, or with other medications, taking outdated or damaged medications, storing medications inappropriately, or improper use of administering devices. Each of these is associated with concomitant deterioration of the medical condition that the patient was afflicted with, leading to increased complexity for that person, both physiologically and economically.

Studies using electronic medication tracking instruments have revealed comprehensive information on the patterns of drug usage by patients. Most of such aforementioned aberrations can be attributed to the patients' omission to take medication or inordinately delaying such dosage [3, 4]. It has been noticed that patients usually improve their drug usage five days prior to, and after, a consultation with their concerned medical adviser, as opposed to thirty days after such consultation – a phenomenon referred to as 'white-coat adherence' [5, 6].

The most common causes for medication adherence can be controlled by the patients themselves. These include – forgetfulness, decision to omit doses, other priorities, lack of information about the gravity of the situation, and emotional factors. To a certain extent, the health care system can also create barriers to adherence by restricting access to health care, using restricted formularies, switching to different formularies, and maintaining high costs for drugs, copayments, or both [7,8,9]. In addition to this, often, lack of time and inclination on the part of the health care practitioners can contribute to non-adherence.

Medical non-adherence vis-a-vis Patients

Having examined the problematic factors associated with non-adherence, we must further study the consequences of non-compliance with medication on the consumers. Clinical trials, rather than regular practice, can be used to delineate the leverages of drug adherence. This is primarily because patients are not entirely conforming with the therapy outlined to them. Unsatisfactory treatment of medical conditions can in fact worsen a patient's condition, which would result in greater reliance on hospital visits, and other more immediate and emergent measures. In certain cases, it can even lead to total failure of the treatment.

Not many patients successfully adhere to their prescribed medication regimen – across all age groups. Studies have revealed that less than 20 per cent of all patients successfully maintain their dosage intervals within the prescribed time limits, adhering strictly to administration times, never missing the prescribed dose, and very rarely taking an extra dose [10]. Further, almost the same fraction of patients adheres to their regimes very poorly, administering less than 40 per cent of prescribed doses [11].

As far as elderly patients are concerned, hospitalizations and nursing home admissions can be regarded as direct costs of non-adherence to medication regimens. Furthermore, non-adherence also results in disease progression, which exacts greater physiological and economic tolls.

It is worth considering the example of schizophrenia to illuminate how devastating the effects of non-adherence can be. Those afflicted

by this disorder have higher mortality risk than the general population because of general physical illness, and potential for accidents and violent death. Patients who do not adhere to their regimens are likely to require more intensive treatment and health care services, and are at greater risk of relapse. Thus, non-adherence shows association with higher economic costs, as well as aggravation of the medical condition.

Determination of Medication Adherence Rate in Patients

There are various methods that are employed to measure the extent to which patients adhere to their medication regimens. However, each of these methods has inherent advantages and disadvantages, and none of them can be considered to be completely flawless. Directly observed therapy, studying the concentration of drugs or metabolites in blood or urine, or presence in the system of bio-markers added to drug formulations are direct approaches to measurement of adherence which, although prima facie efficacious, can be impractical because they are expensive and burdensome to the medical adviser, and can even be distorted by patients. For certain medications however, these are good methods for gauging adherence.

More indirect methods include – questioning the patient, assessment of clinical response, pill counts, studying prescription refilling rates, employing electronic medication monitors, maintenance of medication diaries by patients, and so forth. These methods, while extremely simple to use, can be unreliable because of the associated risk of misrepresentation by the patient. Also, clinical response of a patient can be attributed to a number of different factors separate from adherence, and therefore, can be a confusing measure. Pill counting, that is, counting the number of pills remaining in a container, is easy to use and appears effective, but can be misleading, as the patients can quite easily transfer pills from one vial to another or discard pills, in order to portray their alignment with the prescribed regimen. Also, pill counts do not provide any information on timing of dosage or drug holidays, which are of paramount importance when it comes to gauging adherence. In a closed pharmacy system, refilling rates of prescriptions can be an accurate yardstick for gauging adherence, as long as such rates are ascertained periodically. Electronic instruments which can record timestamps of opening of bottles or dispensation of drops (for example, in the case of glaucoma) can furnish the health care providers with precise information on timing of dosage, but cannot document whether the dosage was correct, because the patient can refrain from taking the medication after opening the container, or otherwise manipulate the process to portray the desired result. Furthermore, the costs of these devices are usually not covered under medical insurance and are thus not pragmatic from the economic point of view [12, 13]. It is submitted that to maximize accuracy, a combination of the various direct and indirect methods should be employed.

The Global Scenario

Globally, the problem of non-adherence is of epic proportions – as expressed by the European Union, which stated that medication non-adherence is not only costing the governments of the Union around 125 billion euros a year, but also leading to premature deaths for as many as 200,000 citizens a year [14]. The WHO has also expressed concerns on the subject, stating that globally, as much as half of the medication prescribed for chronic disorders is not taken appropriately [15]. These alarming statistics translate to losses on three fronts – the health of the patients, the costs of ineffective medicine and consequent further medical care for health care professionals, and reduced sales and loss of standing for the pharmaceutical companies [16].

Studies by the New England Healthcare Institute, in 2009, have shown that an expenditure of over 300 billion dollars is annually incurred due to poor adherence. The fact, that this sum of money constitutes around 14% of the country's total healthcare costs, underlines the need to address the issue of medication adherence more effectively [17]. The first National Assessment of Adult literacy, administered in 2003, reveals that 77 million US adults have basic or less health literacy [18]. The implications of sub-optimal health literacy are illustrated in a 1992 study, conducted by the University of Arizona, which revealed that per annum healthcare expenditures for patients, with sub-optimal health literacy, registered in Medicare were four times as great as for those with high health literacy [19].

In the United Kingdom, the costs of unwanted or unused drugs run into more than 100 million pounds per year [20]. The role of the community pharmacist vis-à-vis drug adherence has been recognized by the Government though, and this is portrayed in a recent policy paper from the Department of Health, which outlines an agenda for ameliorating patient care by strengthening the community pharmacy, which would lead to improvements in adherence support services [21]. This agenda is supported by a study commissioned by the Department, which noted that three-fourths of all people surveyed reported to their community pharmacies for health problems over a six month period, thus implying that the community pharmacies can be quite efficient with such support services [22].

The Indian Scenario

Medication adherence in India is associated with certain distinctive factors which may hold true for other developing countries as well. Unfortunately, there have not been too many controlled surveys which have studied medication adherence in India [23]. However, it is worth mentioning these factors for understanding the uniqueness of the Indian scenario.

One of the factors which can help induce adherence to medication regimens in India is good family support [24]. The joint family system which has prevailed in India for centuries can have a huge positive impact on adherence, as there are always caregivers in the family to administer medication to the elderly, infirm and children.

In addition to this, India is a country where there is no dearth of paid domestic help, generally women, who may even be trained in matters of basic health care and may have been employed in health care centres as lower-level nurses. These domestic nurses – *ayahs* as they are called – can be extremely helpful when it comes to adherence to medication regimes. However, in a country where a large fraction of the population lives close to, or below the poverty line, only those families who are financially stable can afford paid help.

Another factor which must be emphasized is the doctor-patient relationship [25]. In India, the concept of a family doctor, that is, a general practitioner who is easily available for resolving medical problems within a concentrated area is quite common. Patients are usually well-acquainted with these doctors, and this amicable relationship has a positive effect on drug adherence. However, people living in rural or tribal areas hardly have access to even this very fundamental form of medical support. Also, the patient-doctor ratio in India is extremely high, [26] which is why doctors fail to spend adequate time with the patients to acquaint them with the nature of the disorder and its implications. These lead to patients underestimating the seriousness of the disorders, which consequently results in medication non-adherence in many cases.

Additionally, there are some factors which have seriously undermined efforts made by professionals in the health care domain to ensure medication adherence, which include – illiteracy of the patients and concomitantly poor understanding of their disorders, poor socio-economic status, and inadequate involvement of the community pharmacist in doling out information to patients [23].

Interventions Available

The inception point of intervention related to non-adherence is identification of the problem of poor adherence, facilitated by the use of indicators. Some of the major indicators of sub-optimal adherence to drugs are – presence of psychological problems such as depression, evidence of cognitive impairment, treatment of disorders which do not carry symptoms, inadequate discharge planning and follow-up, medication side-effects, lack of belief and insight into the illness on the patient's part, poor relationship between the patient and the medical adviser,

evidence of barriers to care or medication, missed consultations, complexity of treatment, expensive medication or copayments, or both [27].

As discussed earlier, the simplest way for a physician to know whether the patient has been conforming to the medication regimen or not is to have friendly and candid interaction with the patient, thus making sure that the patient is comfortable enough to be honest about the extent of adherence or non-adherence. Since physicians represent the initiation of the process of prescription of medication, and also have the opportunity to develop a relationship based on trust with the patient. However, to effectuate this, the physicians must have the time and inclination to involve themselves earnestly in the prescription process, which, unfortunately enough, is often not a pragmatic solution. In addition to this, it is submitted that community pharmacists should be involved in the process of ensuring medication adherence. By virtue of being more readily available than doctors, they can guide patients towards a better understanding of their disorders and their implications, hence playing a motivational role in ensuring that the prescribed regimen is complied with.

Another method of ensuring improved adherence is by focusing on patient education. Educational intervention, which involves the patients and their families, can go a long way in helping the patients adhere to medications, since it will provide them with an improved understanding of the adversity they are faced with, and the level of seriousness which is required to tackle the situation.A way of augmenting patient information is to invest in health information technology and electronic health records for building data infrastructure. This would, in turn, facilitate sharing of data among physicians, hospitals, pharmacies and other healthcare providers, leading to an improvement in adherence monitoring [28, 29, 30]. Other strategies that can be employed to improve adherence are using pill boxes, simplification of dosage to employ only daily doses, and cues which remind patients about their daily dosages of medication. Those who miss consultations with their physicians are usually the ones who need most assistance to adhere to their medication regimens. These patients would normally benefit from cue-dose training – personalized indicators to medication taking [31, 32]. Also, clinic scheduling can be done more judiciously, taking into consideration the convenience of the patient, thus ensuring that the patient confers with the doctor for follow-up diagnosis, in order to track the progress that the patient is making.

CONCLUSION

As exhibited throughout this article, failure to adhere to medication regimens is a common contributor to substantial deterioration of a patient's health, notwithstanding the fact that in the worst cases it can lead to death. The first step towards resolution of this troublesome issue is identification of the problem – something which requires more efficient indicators. Concurrently, no remedy or intervention has been found to be perfect either, and thus, it is submitted, that combinations of indicative measures and interventions have to be used to ensure optimum levels of drug adherence. While the problem is quite pronounced in developed countries such as the United States and the United Kingdom, it takes on more unique dimensions in developing countries such as India, where illiteracy and poverty aggravate the problem. While reliance can be placed upon governmental authorities to tackle the issue in a more definitive way, further research is required to gauge the approaches which will be most successful and cost-effective in the long run.

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