

Adherence to chronic medications among patients in the Tutong district, Brunei Darussalam

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ABSTRACT

Introduction: Poor adherence to chronic medications is a worldwide issue of striking magnitude. World Health Organisation (WHO) reported that adherence rate to chronic medications in developed countries averages 50%. This study aimed to measure the adherence rate of patients taking prescribed chronic medications in the Tutong district, Brunei Darussalam. **Materials and Methods:** Patients' filling of their prescriptions were used to measure medication adherence rate. A cross-sectional, retrospective study on patients' filling of their prescriptions was collected from their chronic prescriptions. **Results:** Chronic prescriptions from 800 patients were collected for data analysis. 324 patients (40.5%) were adherent to their prescribed treatment and 475 (59.5%) were non-adherent. The average number of medicines patients took in the adherent group was 5.6 and 5.07 in the non-adherent group. The average number of daily doses in the adherent group was 9.36 and in the non-adherent group was 8.68. There was no significant difference in the adherence rate for the different categories of chronic medicines. **Conclusion:** This is the first time a study on medication adherence was conducted in Brunei Darussalam. The information gathered will provide a baseline data on the adherence rate to chronic medications among patients in the Tutong district and gives us a better understanding of local situation. This will also be useful to measure effectiveness of future strategies and interventions employed to improve medication adherence.

Keywords: Adherence, Brunei Darussalam, chronic medications, compliance

INTRODUCTION

Medication adherence is defined as the extent to which a person takes medications according with agreed recommendations from a health care provider. Medication adherence or the lack of it is a worldwide issue of striking

the lack of it is a worldwide issue of striking magnitude. In a World Health Organisation (WHO) report on adherence to chronic medicines (2003), it was estimated that adherence rate in developed countries averaged at 50%. In developing countries, the adherence rate was even lower than this.¹

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Medication adherence is a matter of great concern for healthcare managers, policy

makers and the society. Medicines consume a significant proportion of the healthcare expenditure. According to the Department of Health publication, Pharmacy in England, Building on strengths – delivering the future (2008), the National Health Service (NHS) in England spent £10.6 billion on medicines in 2006-2007. ² The report also estimated that more than £100 million worth of medicines were unused or unwanted. Locally, the Ministry of Health, Brunei Darussalam spent a total of BND\$36.7 million on medicines in 2012. ³

There were various reasons medication non-adherence was of concern. Firstly, not taking or taking less than the prescribed dose of the medicine could result in treatment failure and not achieving the desired treatment outcome. Many patients did not tell their doctors when they were not taking their medicines. This could confound assessment and diagnosis of patients' condition. As a result, doctors may increase the dose or added a new medicine inappropriately. On the other hand, patients who took more than the prescribed dose of medicine could result in adverse drug reaction. Adverse drug reactions and non-compliance had been shown in studies to be leading cause of drug-related hospitalization. ^{4, 5}

Secondly, medication non-adherence led to wastage. Patients may have stopped taking the medicine but still requesting them on repeat prescriptions and hoarding the medicines at home. The Department of Pharmaceutical Services, Ministry of Health, Brunei Darussalam had been advising patient to return any unused or unwanted medicines to the pharmacy for the past 10 years. A significant amount of medicines were returned to

the pharmacy annually and considerable amount of time was spent by the pharmacy staff sorting the returned medicines.

Thirdly, medication non-adherence resulted in additional healthcare costs, either due to increased emergency department visits and hospitalisation or indirectly through reduced quality of life and additional social costs. Safe and proper disposal of unwanted and unused medicines would also incur additional costs.

Finally, for patients with communicable disease like tuberculosis and leprosy, non-adherence was not only detrimental to their own health but it posed a risk to the community. In diseases like HIV/AIDS, non-adherence had been linked to drug resistance. ⁶ With increasing drug resistance and reduced anti-microbial repository, treatment became more difficult and communicable diseases could become a dangerous threat.

There has been no study done before to measure adherence rate to chronic medications in Brunei Darussalam. This study aimed to measure adherence rate of patients taking prescribed chronic medications in Tutong district. The information gathered will provide a baseline data on the adherence rate to chronic medications among patients in Tutong district and gives us a better understanding of local situation. This will also be useful to measure effectiveness of future strategies and interventions employed to improve medication adherence. The WHO report also stated that "increasing the effectiveness of adherence interventions might have a greater impact on the health of the popula-

tion than any improvement in specific medical treatments”.

The aims of this study were to determine; a) the adherence rate to prescribed chronic medications, and b) if factors such as the total number of medicines, the total number of daily doses and the types of chronic medicines have any impact on adherence rate to these chronic medications among patients in the Tutong district, Brunei Darussalam.

MATERIALS AND METHODS

Patients' filling of their prescription was used to measure medication adherence rate. A cross-sectional, retrospective study on patients' filling of their prescriptions was collected from their chronic prescriptions (PHY card). All chronic prescriptions that was received by the pharmacy in PMMPMHAMB Hospital in May 2011 was photocopied and reviewed retrospectively for a minimum of four months for the prescribed medicines, dates of collection, quantity supplied and subsequent dates of collection.

Inclusion criteria: To be included in the study, the photocopied prescriptions had to be legible with patient identifiable details, list of medicines, dates of collection of medicines and the quantity supplied.

Determination of adherence: A patient is deemed adherent if the collection for the subsequent supply was made prior to end of supply calculated from the date of last collection. For example, Patient A collected his medications on 9 Feb 2011 and was given 1-month supply. He next collected his subsequent supply on 10 Mar 2011, the duration from his 1st and 2nd supply was 29 days. Thus patient A

was categorised as adherent as he collected his medications before his previous supply ran out.

As the balance of patients' medications at home at time on the first collection (T_0) was not known to the investigator, each patient was given a balance of three days supply of medicines at time T_0 . This was an average figure taking into consideration realistic situations whereby some patients may have some balance at home at the point of medicine collection and a balance of three days was considered reasonable.

Any patient which did not collect the subsequent supply in excess of the amount from previous supply and 3 days was deemed non-adherent.

Determination of total number of medicines and the total number of daily doses; pill load that patient had to consume was calculated in terms of the total number of medicines that they were prescribed. This was compared between the adherent and non-adherent groups to determine if this was a contributing factor for adherence rate.

The total number of medicines that the patient was prescribed was calculated based on the total number of chronic medicines that the patient was on. Throughout the duration of the study period, some patients had changes made to their chronic medicines which resulted in addition or removal of certain chronic medicines. In such instances, the total number of chronic medicines was for the prescriptions with the longest duration of use during the study period. For example if patient A was prescribed tablet Z for two

months and tablet Y was added for the subsequent three months. The total number of chronic medicines was taken as two.

The total number of daily doses was calculated based on the total doses of chronic medicines patient had to consume each day. For example patient A was prescribed Metformin 500mg tablet 1,000mg three times a day, his total daily dose of Metformin tablet was calculated as six doses.

Descriptive data and statistical data was analysed using the IBM SPSS Statistics 22. Chi-square test was used to compare nominal variables. A p value of less than 0.05 was taken a significant.

RESULTS

A total of 910 chronic prescriptions were photocopied during the study period. Data from 110 prescriptions had to be discarded as they did not meet the inclusion criteria as the required information was not clearly visible in the photocopied prescriptions. Chronic prescriptions from 800 patients were analysed; with 486 (60.8%) female and 314 (39.3%) male.

More than 90% of the patients in this study had their chronic medicines prescribed

by the district hospital itself. The remaining patients are from the main tertiary referral hospital and other health centres.

324 patients (40.5%) were adherent to their prescribed treatment and 476 (59.5%) were non-adherent. Gender comparison showed that 183 (37.3%) female patients and 141 (44.9%) male patients were adherent to their prescribed chronic medications ($p=0.041$).

The average number of medicines that patients took in the adherent group was 5.6 (range 1-13) whereas in the non-adherent group, the average number of medicines were 5.07 (range 1-10) ($p=0.088$).

The average number of daily doses in the adherent group was 9.36 (range 1-23) and in the non-adherent group was 8.68 (range 1-27) ($p=0.271$).

A sub-analysis of the study looked into comparing adherence rates in patients taking six main categories of chronic medicines, namely medicines for lowering blood pressure (BP) cardiovascular medicines (including antiplatelet, anti-arrhythmic and lipid-lowering medicines), oral hypoglycaemic agents (OHA), gastrointestinal medicines,

Table 1: Breakdown of the types of medications and adherence to medications.

Categories of chronic medicines	Sample size (n)	Adherent (%)	Non-adherent (%)
BP lowering medicines	662	276 (41.7)	386 (58.3)
Cardiovascular medicines	648	271 (41.8)	377 (58.2)
Hypoglycaemic medicines	390	160 (41.0)	230 (59.0)
Gastrointestinal medicines	176	79 (44.9)	97 (55.1)
Respiratory medicines	116	47 (40.5)	69 (59.5)
Medicines affecting CNS	38	27 (71.1)	11 (28.9)

BP: blood pressure, CNS; central nervous system

respiratory medicines and medicines affecting the central nervous system (CNS).

There was no significant difference in the adherence rate for the different categories of chronic medicines compared to the overall adherence rate. The only exception was with medicines affecting the CNS where the adherence rate was significantly higher with 71.1% of the patients being adherent to therapy. Table 1 below shows the details of the adherence rate for the different categories of chronic medicines.

DISCUSSION

This study measured the adherence rate to chronic medicines among patients who collected their medications in a district hospital in Brunei Darussalam and showed lower adherence rate to chronic medicines to what have been reported by the WHO. However, this study may not be reflective of the situation for the whole country but at present it was the only available data on adherence to chronic medicines available in Brunei Darussalam.

The study used the refilling of patients' prescriptions as a measure of adherence rate. One issue with this approach was that patients' actual consumption of the medicines could not be determined. Patients may collect their medicines but may not necessarily be compliant with taking them. There is currently no 'gold standard' for measuring adherence but various strategies have been reported in the literature.¹ The method used in this study have been shown to be a reliable method for measuring adherence with significant co-relations with other methods of measuring adherence.⁷⁻¹⁰

This study made certain assumptions based on practical situations such as a balance of three days medicines at time T_0 of data collection, and the total number of chronic medicines based on the duration of use in the study period. This, however, is unavoidable in behavioural studies as many factors come into play that would affect outcomes. Such scenarios are akin to real, clinical practice where patients frequently report that there had excess of certain medicines but run out of other medicines. Additionally, these assumptions should not have any impact on the outcome of the study as it was applied to all patients in this study, and hence would not resulted in any bias.

Contrary to common belief, the study showed that adherence rate is not directly proportional to the number of medicines and the number of doses taken per day. The adherent group actually took more medicines and doses than the non-adherent group. Adherence to prescribed medicines is a complex process with many factors influencing its outcome. The WHO had produced a model of factors that predicts medications non-adherence, called 'the five dimensions of adherence' involving five different factors; a) social and economic, b) health care team and system-related, c) condition-related, d) therapy-related, and e) patient-related factors.¹ The number of medicines and total daily doses were related only to the therapy-related factors aspect of the model.

Interestingly, the study showed that male patients were more adherent to their chronic medications compared to female patients. Although gender is not a particularly strong determinant for adherence, several

other studies also reported male patients to be more adherent to prescribed therapy.¹¹⁻¹³

There was also no significant difference between adherence rate among patients taking different types of chronic medicines, indicating that there was no direct link with different diseases. Other studies have also shown that non-adherence to chronic medicines were suboptimal in various chronic diseases.^{14, 15} It is interesting to note the present study showed a high adherence rate to CNS medicines. This could be due to the much smaller sample size of patients with this category of medicines. Another possibility is that CNS disease is a condition where the physical signs and symptoms could be seen or felt by the patients (i.e. seizures in patients on anti-epileptics or the lack of movement in Parkinson's disease) and hence resulting in compliance. Compared to condition such as hypertension which is symptomless, patient may not think much about the need for taking the medicines. What can be gathered from this data is that non-adherence to medicines affect all types of chronic diseases.

This study showed that there is still much we can do to improve medication adherence. Chronic diseases particularly non-communicable chronic diseases (NCD) were the top four causes of mortality in Brunei Darussalam in the last decade.¹⁶⁻²⁰ Strategies to improve adherence to chronic medicines would meet two of the five objectives of the recently launched Brunei Darussalam National Multi-sectorial Action Plan for the Prevention and Control of Noncommunicable Diseases 2013-2018 (BruMAP-NCD), that is to identify people at risk for NCDs and manage effectively, and improve the quality of care and

outcome of NCD management.²¹

The data gathered from this study is just the beginning. More work will have to be done to understand and determine the reason for non-adherence — is it intentional or non-intentional? This will help us to ascertain the type of support that the healthcare system can provide to assist patients in taking their medications. Effective strategies can then be developed to improve medicine adherence and optimise medicine use. Improving medicine adherence has been shown to improve treatment outcomes and reduce healthcare costs.^{22- 24}

In conclusion, this is the first time a study on medication adherence was conducted in Brunei Darussalam. It helps us to gauge the current situation of medication adherence at a district level. More work will need to be carried out to understand the reason for non-adherence and strategies can then be formulated accordingly to improve adherence rate.

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