Drug Utilisation Evaluation (DUE) on Non-Communicable Diseases of Orang Asal during Medical Outreach by IMARET in Gua Musang, Kelantan

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Abstract

Orang Asal are the indigenous people of Malaysia. Orang Asal in Peninsular Malaysia are collectively known as Orang Asli. They are a marginalised population group. Health status among the indigenous is generally poor and shows an increasing trend of chronic non-communicable diseases (NCDs).Thus, IMAM Response & Team Relief (IMARET), a medical-based Non-Governmental Organisation (NGO) organises a mobile clinic which provides monthly free healthcare services to Orang Asli population. Drug Utilisation Evaluation (DUE) is an ongoing, systematic criteria-based programme of medicine evaluation to ensure appropriate medicine use. This study was conducted to determine the DUE on the physician prescribing pattern on NCD. The specific objectives are to identify the prevalence of NCD, to determine the appropriate medications used for NCD and to compare the physician prescribing pattern. This study was conducted as retrospective, descriptive and cross-sectional study between January 2017 to December 2018. The subjects were screened using convenience sampling based on inclusion and exclusion criteria. It was carried out using prescription data collected in the mobile clinic. Hypertension was the most common prevalent among the Orang Asli (n = 48, 18.5%), followed by gout (n = 7, 2.7%), dyslipidaemia (n = 4, 1.5%), diabetes mellitus (n = 2, 0.8%) and asthma (n = 1, 0.4%). Drug therapy is a very important component in the disease management. The most common prescribed anti-hypertensive, anti-gout, anti-dyslipidemic, and anti-asthmatic agents were calcium channel blocker, colchicine, statin and short-acting beta-2 agonist (SABA) respectively. However, common prescribed anti-diabetic agents were biguanide and sulfonylurea. Oral nifedipine, perindopril, salbutamol and glibenclamide were not listed in National Essential Medicine List (NEML). In contrast, only oral glibenclamide was not listed in Ministry of Health (MoH) Medicine Formulary. Appropriate prescribing pattern among the physicians help to reduce the morbidity and mortality of NCDs among Orang Asli. Appropriateness of the prescribed medications is influenced by the limited availability of the medications. Rational and standard prescribing pattern by the physicians are needed to ensure effective and safe treatment for the patients.

Keywords: Orang Asal, Non-communicable Disease, IMARET, Drug Utilisation Evaluation, Prevalence, Physician Prescribing Pattern, Retrospective, Convenience Sampling, NEML, MOH Medicine Formulary.

DOI: 10.47750/pnr.2022.13.S07.012

INTRODUCTION

1. Orang Asal

Orang Asal is the collective name for Orang Asli of Peninsular Malaysia and the Natives of Sabah and Sarawak [1]. They are the indigenous people of Malaysia [2]. Orang Asli in the Peninsular Malaysia comprises 0.5% of the population. They are classified into three main tribal groups, which are Senoi, Proto-Malays (Original Malays) and Negrito based on ethno-linguistic differences [3]. Senoi is the major class of Orang Asli, followed by Proto Malay and Negrito [2].

Health disparities between indigenous and non-indigenous populations are ubiquitous worldwide [4]. In comparison to the general population globally, the health status of indigenous is poor in general [5]. Thus, they are more likely

to experience disability and reduced quality of life [6]. On top of that, the average life expectancy for Orang Asli is 53 years, which is lower than the national average of 73 years [2]. They die younger than the non-indigenous population due to poor health [6]. It reflects the structural inequalities of these groups [6].

2. Non-Communicable Disease (NCD)

According to World Health Organization (WHO), NCD which also known as chronic disease can be defined as a medical condition that is non-infectious and non-transmissible from person to person [7]. It tends to develop slowly over long periods of time. These non-communicable diseases (NCDs) are the major cause of death worldwide [8].

NCD is expected to be the 80% of the global burden disease by 2020 [9]. The burden of disease of NCD in Malaysia is at an alarming rate because of the increasing prevalence of NCD from 2006 to 2015 [8]. In Malaysia specifically, the shift from infectious disease and diseases borne from malnutrition rapidly changed to chronic NCD occurred concurrently with urbanisation and higher levels of socioeconomic growth and development [10].

Poverty is a risk factor for chronic diseases and it is prevalent among indigenous peoples globally [2]. Eventhough they are less than 5% of the global population, they account for almost 15% of poor people worldwide [11]. Nowadays, exposure to NCD risk factors keep on increasing due to demographic shift, economic growth and globalisation [12].

3. Drug Utilisation Evaluation (DUE)

DUE or also known as drug utilisation review (DUR) is an authorised and structured ongoing review of practitioner prescribing, pharmacist dispensing and patient use of medication [13]. Based on WHO guidelines, drug utilisation is defined as the marketing, distribution, prescription and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences [14].

It helps the healthcare professionals to foster more efficient use of scarce healthcare resources especially the pharmacists because they are expert in the medication therapy management [14]. Then, DUE also prevents medication error, drug-drug interaction, drug-disease interaction, poly-pharmacy and toxicity [14]. Intervention will be initiated if the therapy is inappropriate. This is to optimise the drug therapy.

4. Study Justification

This research study needs to be conducted because NCDs keep on increasing in Malaysia year by year [15]. However, the data from the National Health and Morbidity Surveys (NHMS) focused more on major ethnic groups of Malay, Chinese and Indians without including Orang Asli or had included them as one nominal group [3]. Thus, the current data on prevalence of NCD in Orang Asli is very limited and not comprehensive. Addressing this discrepancy is important in ensuring the right of Orang Asli even though they constitute approximately only 0.5% (150 000) of the total Malaysian population [16].

5. Objective

General Objective

To determine the drug utilisation evaluation (DUE) of the physician prescribing pattern on non-communicable disease among Orang Asal in Gua Musang, Kelantan.

Specific Objectives

1. To identify the prevalence of non-communicable disease among Orang Asal.
2. To determine the appropriate medications used for non-communicable disease among Orang Asal according to the standard prescribing guidelines.
3. To compare the physician prescribing pattern between the WHO National Essential Medicine List and MOH Medicine Formulary.

METHODS

Table 1: Methods

Study Design	**Retrospective, descriptive, cross-sectional study**
Study Site	Gua Musang, Kelantan (Balar, Belatin, Gob, Jader Baru, Others, Sedal, Simpor, Sinderut)
Research Instrument	Prescription form
Data Extraction	Data collection form
Study Population	259 Orang Asli
Sampling Method	Convenience sampling
Inclusion Criteria	1) Orang Asli resident 2) >18 years old 3) Medical history with NCD or newly diagnosed with NCD 4) Patient with complete record

Exclusion Criteria	1) Prescription with incomplete and unclear medical record (gender, age, prescribed drug name) 2) Patient with no treatment provided and advice given 3) More than one patient in every medical check-up form 4) Pregnant women
Data Collection Period	January 2017 –December 2018
Study Duration	January 2019 – December 2019

RESULTS

1. Prevalence of NCD among Orang Asli in Gua Musang (Total: 259 Orang Asli patients)

Table 2: Prevalence of NCD

NCD	Prevalence	Percentage (%)
Hypertension	48	18.5
Gout	7	2.7%
Dyslipidaemia	4	1.5
Diabetes Mellitus	2	0.8
Asthma	1	0.4

2. Appropriate Medications used for NCD

Table 3: Medications used for NCD

NCD	Types of Medications	Dose	Quantity	Percentage (%)
Hypertension (Monotherapy)	Amlodipine	10 mg	15	62.5
	Amlodipine	5 mg	6	25.0
	Frusemide	40 mg	1	4.2
	Metoprolol	100 mg	1	4.2
	Perindopril	4 mg	1	4.2
Total			**24**	**100.0**
Hypertension (Dual Therapy)	Amlodipine Perindopril	10 mg 4 mg	3	42.9
	Losartan Perindopril	50 mg 4 mg	1	14.3
	Amlodipine Perindopril	10 mg 8 mg	1	14.3
	Amlodipine Simvastatin	10 mg 20 mg	1	14.3
	Amlodipine Nifedipine	10 mg 10 mg	1	14.3
Total			**7**	**100.0**
Gout	Colchicine	0.5 mg	1	100.0
Total			**1**	**100.0**
Dyslipidaemia	Simvastatin	20 mg	2	66.6
		40 mg	1	33.3
Total			**3**	**100.0**
Diabetes Mellitus	Metformin	500 mg	1	50.0
	Glibenclamide	5 mg	1	50.0
Total			**2**	**100.0**
Asthma	Salbutamol	2 mg	1	33.3
		4 mg	1	33.3
		100 mcg/dose	1	33.3
Total			**3**	**100.0**

3. Physician Prescribing Pattern between WHO National Essential Medicine List (NEML) and MOH Medicine Formulary

Table 4: Medications in WHO NEML 2019

Prescribed Medications	Medications in WHO NEML	Frequency	Percentage (%)
Oral Amlodipine	Yes	28	59.6
Oral Nifedipine	No	1	2.1
Oral Perindopril	No	6	12.8
Oral Losartan	Yes	1	2.1
Oral Metoprolol	Yes	1	2.1
Oral Frusemide	Yes	1	2.1
Oral Salbutamol	No	2	4.3
Inhalation Salbutamol	Yes	1	2.1
Oral Simvastatin	Yes	3	6.4
Oral Metformin	Yes	1	2.1
Oral Glibenclamide	No	1	2.1
Oral Colchicine	Yes	1	2.1
	Total	47	100.0

Table 5: Medications in MOH Medicine Formulary 2018

Prescribed Medications	Dose	Medications in MOH Medicine Formulary	Frequency	Percentage (%)
Oral Amlodipine	5 mg	Yes	6	12.8
	10 mg	Yes	22	46.8
Oral Nifedipine	10 mg	Yes	1	2.1
Oral Perindopril	4 mg	Yes	5	10.6
	8 mg	Yes	1	2.1
Oral Losartan	50 mg	Yes	1	2.1
Oral Metoprolol Tartrate	100 mg	Yes	1	2.1
Oral Frusemide	40 mg	Yes	1	2.1
Oral Salbutamol	2 mg	Yes	2	4.3
Inhalation Salbutamol	100 mcg/dose	Yes	1	2.1
Oral Simvastatin	20 mg	Yes	2	4.3
	40 mg	Yes	1	2.1
Oral Metformin	500 mg	Yes	1	2.1
Oral Glibenclamide	5 mg	No	1	2.1
Oral Colchicine	0.5 mg	Yes	1	2.1
		Total	47	100.0

DISCUSSION

1. Prevalence of NCD among Orang Asli in Gua Musang

The highest prevalence of NCD was hypertension, followed by gout, dyslipidemia, diabetes and asthma. In Malaysia, the incidence of hypertension among Malaysians aged 18 years and above was 35.3% in 2015 [17]. The prevalence of hypertension among Orang Asli has been rising due to assimilation and modernisation [18]. A study by C. M. Wong et al., 2018 revealed the prevalence of hypertension among Orang Asli at Tasik Chini was 41.7% [15]. Surprisingly, the results were much higher compared to the National Health Morbidity Survey (NHMS) 2015 [15].

However, there is a scarcity of information on the prevalence of gout among Orang Asli community. The prevalence of gout was 3.9% among adults in the United States (9.2 million people) in 2015-2016 [19].

One study conducted between 2011 to 2014 showed the higher incidence of high blood cholesterol level at 37.2% among the Orang Asli community [20]. In 2018, another study by Azlin *et al.* reported the percentage of significant lower high-density lipoprotein cholesterol (HDL-C) level (less than 1 mmol/l) among Orang Asli population were high [21].

The prevalence of DM among Orang Asli communities 20 years ago was negligible [3]. However, the latest results from the Metabolic Syndrome Study of Malaysia revealed the prevalence of DM among Orang Asli is at 22.9%. [3]. In 2015, one study found 2.8% of the 1,382 Orang Asli surveyed from 2011 to 2014 in Peninsular Malaysia had diabetes and the result was lower than the NHMS 2011 average of 15.2%. However, it revealed higher rate of pre-diabetes [20].

The asthma incidence also was low among indigenous Malaysians. However, the prevalence of self-reported and confirmed bronchial asthma tend to be greater among Orang Asli who had contact with pets, smoking individuals as well as family history of asthma [22].

2. Appropriate Medications Used for NCD

In the treatment of hypertension, monotherapy was higher than dual therapy because most of Orang Asli suffered from Stage 1 hypertension. In monotherapy treatment, the most frequent medications used was the amlodipine 10mg (n = 15, 62.5%) and followed by amlodipine 5 mg (n = 6, 25.0%). Amlodipine allows dilation of both afferent and efferent arterioles as well as reduce glomerular capillary pressure and proteinuria which further lower the blood pressure [17]. Besides, amlodipine has anti-inflammatory and antioxidative effects in giving vasoprotective effects beyond its BP-lowering benefits [23].

For dual therapy treatment of hypertension, amlodipine 10 mg combined with perindopril 4 mg was the most popular based on Figure 3.21. Ojji et al., 2019 study had shown that those receiving amlodipine plus perindopril had more reduction ambulatory SBP than those receiving perindopril plus hydrochlorothiazide (18.1 mm Hg versus 14.2 mm Hg)

[24].

For gout treatment, colchicine is an anti-inflammatory agent which serves as another primary treatment option in acute gout management [25]. However, the side effects of colchicine include nausea, vomiting, cramps and pain [26].

Besides, in treating the dyslipidaemic patient, statin treatment remains the cornerstone therapy in lowering the lipid level as it reduces the low-density-lipoprotein cholesterol by 21-55% [27]. On the other hand, statins also have moderate effect in lowering triglycerides by 6-30% and elevating high-density-lipoprotein-cholesterol by 2-10% [27].

Treatment of diabetes applied dual combination therapy of metformin 500 mg and glibenclamide 5 mg to give the synergistic effects as both of these drugs had different mechanisms of action. Metformin reduces the blood glucose especially fasting blood glucose by decreasing hepatic glucose production and does not produce insulin [28]. Thus, it has low risk of hypoglycaemia [28]. In contrast to metformin, the glibenclamide lowers the blood glucose by producing insulin secretion which is the major cause of hypoglycaemia among the patients [28].

For asthma treatment, salbutamol was prescribed because it works by binding to beta-2 receptor on bronchial smooth muscle which results in bronchodilation without tachycardia associated with activation of beta-1 receptor on cardiac muscle [29].

3. Physician Prescribing Pattern between WHO NEML and MOH Medicine Formulary

Four types of medicines were not listed in NEML, which were oral nifedipine, oral perindopril oral salbutamol and oral glibenclamide. In comparison with NEML, only one medicine was not listed in MOH Drug Formulary. It was oral glibenclamide 5 mg.

It can be clearly observed that more prescribed medications were in the MOH Medicine Formulary than the WHO NEML. This is because of availability of the medications in MOH Medicine Formulary is more than WHO NEML.

Hence, comparison between WHO NEML and MOH Medicine Formulary is needed to ensure the Orang Asli receive the same treatment with the general population in Malaysia without over-utilisation or under-utilisation of the source of the medications.

4. Future Research

For future study, anthropometric measurement such as BMI, waist circumference, waist-hip-ratio and waist-height-ratio can be applied to the mobile clinic in determining NCD. Then, ensure that all the Orang Asli patients have BP measurement and blood glucose reading when they attend the mobile clinic. Moreover, once the prevalence of NCD can be determined from specific location of mobile clinic, the IMARET can allocate a specific specialist to a specific location.

CONCLUSIONS

Appropriate prescribing pattern among the physicians help to reduce the morbidity and mortality of NCD among Orang Asli. However, the physician prescribing pattern are influenced by the availability of the medication during the mobile clinic. Thus, the prescribing pattern among the physicians are significant in maximising clinical effectiveness, minimising harms, avoiding wasting scarce healthcare systems and also respect patient choice.

FUNDING

This research received no external funding.

ACKNOWLEDGEMENTS

IMARET mobile clinic data and CUCMS Research Ethics Review Committee (CRERC) Approval (Approval: CUCMS/CRERC/AL-EXEMPTION (02-2019).

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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