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Effectivity of Indonesia Chronic Disease Management Program (PROLANIS) to Control Hypertension and its Comorbidities at Primary Health Care

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Abstract

BACKGROUND: National prevalence of hypertension in Indonesia is increasing in the past few years. One of the reasons is because of the weaknesses in health systems, particularly at the primary care level. To resolve this issue, Indonesian government launched a chronic disease care program (PROLANIS) designed to be done at primary health care with the aim to control hypertension. Wates primary health care routinely conducts the program from April 2018.

AIM: This study aims to evaluate the effectivity of PROLANIS in controlling hypertension and its comorbidities at Wates primary health care.

METHODS: This study was an observational retrospective cohort study using secondary data from PROLANIS report at Wates primary health care in Mojokerto city, Indonesia. The study population was hypertensive patients that voluntarily joined the program on April 2018 and routinely attend evaluation follow-up every 6 months. Follow-up evaluation including blood pressure (BP), body mass index (BMI), total cholesterol (TC), high-density lipid (HDL), low-density lipid (LDL), triglyceride, and estimated glomerular filtration rate (eGFR).

RESULTS: There were 44 participants included for the analysis. Median systolic and diastolic BP were always within normal range. Triglyceride serum level showed an improvement in every follow-up evaluation. BMI and LDL showed an improvement in the first follow-up but deteriorated afterward. TC only showed a remarkable improvement in the last follow-up evaluation, while HDL and eGFR result were fluctuate.

CONCLUSION: PROLANIS was effective to control BP at Wates primary health care, but not effective to control all comorbidities. Future study needs to be done to elucidate the effectivity of this program countrywide.

Introduction

Hypertension is one of the leading risk factors for mortality worldwide. It is the major risk factor for cardiovascular diseases, the most leading cause of global death nowadays [1]. From 17 million deaths a year because of cardiovascular disease, complication of hypertension was accounted for 9.4 million deaths. Hypertension is responsible for at least 51% of deaths due to stroke and 45% of deaths due to heart attack [2]. In Indonesia, the national prevalence of hypertension in adults is increasing from 25.8% in 2013 to 34.1% in 2018. In East Java, the incidence of hypertension is higher than the national prevalence and listed as the sixth leading province of hypertension [3].

Detection, treatment, and control of hypertension are insufficient globally because of the weaknesses in health systems, particularly at the primary care level. To resolve this issue, population-wide policies and interventions are required to address the modifiable risk factors, including but not limited to eating food containing too much salt and fat, physical inactivity, harmful use of alcohol, tobacco consumption, and inadequate access to health care. In addition, integrated programs need to be established at the primary care level, to improve the efficiency and effectiveness of detection, and management of hypertension to prevent heart attack and stroke through a total risk approach [1]. By 2025, it is aimed to achieve 25% relative reduction in the prevalence of raised blood pressure (BP) or to contain the prevalence of raised BP according to national circumstances, 10% relative reduction in prevalence of insufficient physical activity, 30% relative reduction in mean population intake of salt/sodium intake, 10% relative reduction in the harmful use of alcohol, 30% relative reduction in prevalence of current tobacco use in persons aged older than 15 years old, and at least 50% of eligible people receive drug therapy and counseling to prevent heart attacks and strokes [4].

Indonesian government has launched chronic disease care program named PROLANIS since 2014.

One of the aims of this program is to treat and control patients with hypertension so that the complication could be avoided and the patients could achieve optimum life quality [5]. PROLANIS is specifically designed to be implemented at the primary care level with 4 main activities, which are (1) medical consultation; (2) monthly education regarding health issues and knowledge; (3) reminder to visit primary health care for medical evaluation using social media platform; and (4) home visit to evaluate associated factors from patients that not achieve satisfactory medical evaluation results 3 months in a row. Other than that, PROLANIS participants also get benefit of free laboratory checkup of lipid profiles and kidney function every 6 months as follow-up evaluation. However, evaluation study regarding the effectivity of PROLANIS in controlling hypertension in Indonesia is still scarce until now.

Wates primary health care is one of the government-owned primary health care located in Mojokerto city, an area with a population of 138,323 people. This primary health care covers a total of 21,088 people and started to routinely implement PROLANIS since April 2018. This study aims to evaluate the PROLANIS effectivity in controlling hypertension at Wates primary health care.

Methods

This study was an observational retrospective cohort study using secondary data from PROLANIS report at Wates primary health care, Mojokerto city, East Java, Indonesia. The study population was all hypertensive patients that joined PROLANIS group since April 2018 when PROLANIS activities were done routinely for the 1st time and underwent the evaluation. Every 6 months (on October 2018, April 2019, and October 2019), evaluation was done again as follow-up. Exclusion criteria were participants who left the PROLANIS, deceased, did not attend the follow-up evaluation every 6 months on either October 2018, April 2019, or October 2019.

Evaluation consists of body mass index (BMI), systolic BP (SBP) and diastolic BP (DBP), lipid profiles (total cholesterol [TC], high-density lipid [HDL], low-density lipid [LDL], triglyceride), and serum creatinine evaluation. BMI and BP were measured by the health care worker from Wates primary health care, while laboratory evaluation was done by designated third parties laboratory at Mojokerto city. Data of BMI were presented in kg/m^2, BP in mmHg, and lipid profiles in mg/dL. Serum creatinine was converted to estimated glomerular filtration rate (eGFR) using Cockcroft-Gault formula and presented in ml/min/1.73 m^2 [6]. Participants' compliance to the PROLANIS was measured with their attendance on the routine meeting. Those who did not attend the meeting at least once will consider did not comply.

This study followed the principle of the Declaration of Helsinki and has been approved by the health department of Mojokerto city (Approval number: 072/27/417.405/2020). Details that might disclose the identity of the study subjects were omitted. Acquired data were analyzed using the SPSS version 25.0 (IBM Corp., Armonk, N.Y., USA). All necessary differences and errors were rectified before the processing. Variables presented were coded with numeric values. Data were expressed as median (Interquartile range). Kolmogorov–Smirnov test was used to evaluate the data normality. Repeated measures ANOVA test, Friedman test, Wilcoxon signed-rank test, and pairwise comparison with Bonferroni correction were used for the statistical analysis. $p < 0.05$ was considered statistically significant.

Results

There were 469 patients diagnosed with hypertension at Wates primary health care until April 2018. Among them, 62 patients voluntarily joined as PROLANIS participants on April 2018. On October 2019, there were 44 participants that were included in the study analysis (Figure 1).

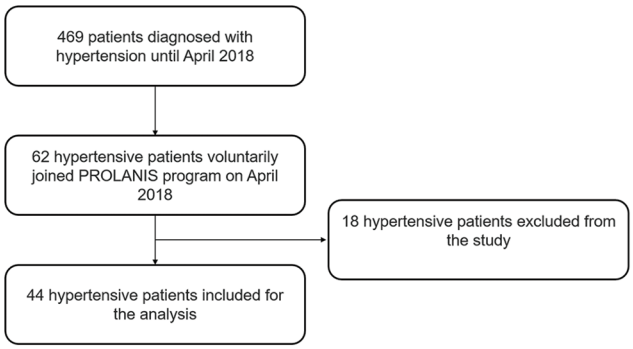

Figure 1: Flowchart of the study population selection

The number of female participants was higher than the male participants. Among all participants included in this study, only 6 (13.6%) participants routinely come to PROLANIS every month (Table 1).

Table 1: Baseline characteristic of the study population

Characteristic	n=44, n (%)
Age (mean±SD)	61.59±6.57
Sex	
Male	17 (38.6)
Female	27 (61.4)
Comorbidity with diabetes *mellitus*	
Yes	23 (52.3)
No	21 (47.7)
Compliance to attend PROLANIS	
Comply	6 (13.6)
Did not comply	38 (86.4)

Before the PROLANIS routinely started, baseline evaluation of the study population on April 2018 was as follows: BMI = 25.5 (22.65–27.73) kg/m^2,

Table 2: Follow-up evaluation results every 6 months

Follow-up evaluation	n = 44 median (IQR)				p value
	April 2018	October 2018	April 2019	October 2019	
BMI (kg/m^2)	25.5 (22.65–27.73)^{a,b†}	24.77 (21.93–25.95)^{a,b†}	26.36 (24.57–29.31)^{a†}	26.87 (24.97–29.59)^{b†}	<0.001$^{\#}$
SBP (mmHg)	130 (120–140)^{a†}	120 (120–130)^{b†}	130 (120–140)^{b†}	130 (120–140)^{c†}	0.063$^{\#}$
DBP (mmHg)	80 (80–87.5)^{a,b†}	80 (80–90)^{c,d†}	80 (80–90)^{a,c†}	80 (80–90)^{b,d†}	0.046$^{\#}$
TC (mg/dL)	208 (178.75–236.25)^{a†}	203 (178.25–232.5)^{b†}	206 (170.25–232.5)^{c†}	132 (83.5–219.75)^{a,b,c†}	<0.001$^{\#}$
Triglyceride (mg/dL)	163 (105.75–207)^{a,b†}	132 (83.5–219.75)^{c,d†}	123.5 (70–171.75)^{a,c†}	117 (85–173.25)^{b,d†}	0.005$^{\#}$
HDL (mg/dL)	46 (41.25–56)^{a,b†}	50 (46.25–58.75)^{a,c†}	47 (41.25–57)^{c†}	51 (45–58)^{b†}	<0.001$^{\#}$
LDL (mg/dL)	130 (113–160)^{a‡}	114 (95–148.5)^{b‡}	131.5 (99.25–155.5)^{c‡}	145.5 (120.5–164.25)^{a,b‡}	<0.001+
eGFR (ml/min/1.73m^2)	58.5 (45–69)^{a‡}	52 (42–67)^{a,b,c‡}	63 (44.5–74)^{b‡}	57 (47.25–72.75)^{c‡}	0.004+

BMI: Body mass index, DBP: Diastolic blood pressure, eGFR: Estimated glomerular filtration rate, HDL: High-density lipoprotein, IQR: Interquartile range, LDL: Low-density lipoprotein, SBP: Systolic blood pressure, TC: Total cholesterol. #Friedmann test was used, †Wilcoxon signed-rank test was used, +Repeated measurement ANOVA was used, ‡Pairwise comparison with Bonferroni correction was used. p<0.05 was considered statistically significant. Values in a row with same superscripts letter were significantly different from each other.

SBP = 130 (120–140) mmHg, DBP = 80 (80–87.5) mmHg, TC = 208 (178.75–236.25) mg/dL, triglyceride = 163 (105.75–207) mg/dL, HDL = 46 (41.25–56) mg/dL, LDL = 130(113–160)mg/dL,andeGFR=58.5(45–69)ml/min/1.732m^2. Follow-up evaluation every 6 months on October 2018, April 2019, and October 2019 showed no significant difference in SBP (p = 0.063) and the median value always within the normal range. DBP result showed significant difference (p = 0.046), but the median value was still within the normal range. Triglyceride serum level showed improvement in every follow-up evaluation, with the significant one during the first and second follow-up evaluation (p = 0.005). TC showed no significant difference in the first two follow-up evaluation and suddenly showed a remarkably improvement in the last follow-up evaluation (p < 0.001). BMI and LDL evaluation result showed an improvement during the first follow-up, but it was deteriorated afterward (all p < 0.001). HDL and eGFR follow-up evaluation were worsened at first, improved at the second evaluation, and worsened again in the last evaluation (p < 0.001 and p < 0.004, respectively) (Table 2).

Discussion

In this study, we found that PROLANIS successfully maintains BP to be within normal range. The previous study from other area in Indonesia found that PROLANIS is effective to control BP through health status monitoring, club activity, home visit, and education on the eating pattern and physical activities programs [7]. Other studies from Korea also showed that population-based intervention is beneficial in improving hypertensive patients' adherence to medication [8]. Lu *et al*. also concluded that population-based hypertension intervention could help improving BP control, especially the intervention involving interactive session; this method was more effective compared to self-study and classical lecture [9].

Some strategies were implemented in Brazil to control obesity: changing the diet pattern of the population by decreasing saturated fat from the processed food and promoting physical activity. Lobato *et al.* argued that obesity is significantly affected by the environment. The environment which promotes high-calorie diet and low physical activity will increase the population's obesity prevalence. Thus, a population-based intervention is an effective way to mitigate this health problem [10]. Meanwhile, PROLANIS intervention only focuses on participants' education without any more widespread policy such as changing the content of processed food. PROLANIS does promote physical activity among its participants. However, there is still lack of definitive guideline regarding what kind of physical activity should be practiced. Other than that, there could be other behavioral factors that affect the BMI changes because BMI control is attributed to an individual lifestyle [11]. These various factors might be the reason behind the worsening of BMI of this study's participants.

A Japanese study used a 6-month population-based intervention including personal counseling, group exercise, and reminders by telephone. This method was able to decrease the 10-year cardiovascular disease risk of the participants [12]. In our study, we found an improvement on triglyceride serum level throughout evaluation period. For TC serum level, it only showed significant improvement in the final evaluation period. While for the other comorbidities, it showed fluctuated results. We argue that it was because the programs were not standardized countrywide, especially regarding health education program. The topic for the health education program was made by health-care personnel from each health-care facility instead of by the government, therefore, the topics could be different from one and other health-care facilities and might also focused only in several topics. However, we did not have the data regarding topics that were given to the participants since the beginning of the program to support our arguments.

Another population-based intervention on cardiovascular disease in India implemented the following measures: Poster, handout, street plays, and lectures. These measures are quite like the ones used in PROLANIS. Unfortunately, this intervention only managed to increase the population's knowledge without any significant behavioral change [13]. Another important factor in a population-based intervention is a significant exposure (ratio of number of participants and total population) [14]. Unfortunately, <20% of all participants of this study come regularly to PROLANIS meeting. Thus, future policy should also focus on increasing the participation of PROLANIS.

Although PROLANIS is a breakthrough national program, recent review article showed that there were

still several limitations regarding the implementation of this program. There was no written standard operating procedure available regarding detailed activities that need to be done, although socialization had been done to all primary health care. The budget to implement all programs needs to be evaluated, as it found to be not enough. Human resources are still lacking in several areas, especially to conduct the home visit program [15].

There are several limitations in this study. This study was a single center study with a small sample population, therefore, the findings in this study could not represent the effectivity of PROLANIS countrywide. Other than that, because the secondary data used in this study was from PROLANIS report and not from the patients' medical report, information regarding study population sociodemographic characteristic could not be shown. Moreover, there are also no data regarding what kind of health education was given to the PROLANIS participants every month. However, despite the limitation in this study, we hope that this study could give an insight regarding the effectivity of PROLANIS after 18 months of implementation.

Conclusion

PROLANIS was effective to control BP of hypertensive patients at Wates primary health care. However, it was not effective to control all comorbidities. Moreover, the participants' compliance was low for this program. Future study with larger data needs to be done to elucidate the effectivity of PROLANIS countrywide to control hypertension and its comorbidities.

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