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Do descendants of families contribute to type 2 diabetes mellitus?

Fatma Nuraisyah, Solikhah Solikhah, Rochana Ruliyandari
Faculty of Public Health, Universitas Ahmad Dahlan, Indonesia

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ABSTRACT

Diabetes is a public health problem in Indonesia that has been increasing in recent decades. Screening for diabetes was usually identified as pregnant women, adolescents, adults, children, older and obesity, while based on investigation descendent was yet. This cross-sectional study aimed to know the random level blood glucose of family history type 2 diabetes mellitus (T2DM). The target group for screening was people with a family history in one of their descent of T2DM with age >20 years in Kulon Progo, DIY, Indonesia. We conducted a detection of random level blood glucose from a venous blood sample. A high level of blood glucose was diagnosed when random blood glucose reaches ≥200 mg/dl. The participant with high level of blood glucose was 29.0%, while borderline blood glucose (≥110-199 mg/dl) was revealed 38.7% of 15.3% subject indicated with mother history. Descendant screening of family history T2DM is early detected respondent with high glucose level and reduced the severe complication.

Corresponding Author:

Solikhah Solikhah,
Faculty of Public Health,
Universitas Ahmad Dahlan,
Jl. Prof Soepomo Janturan Warungboto Yogyakarta 55166, Indonesia.
Email: solikhah@ikm.uad.ac.id

1. INTRODUCTION

Type 2 Diabetes Mellitus (T2DM) is one of the chronic disease problems fourth in Indonesia. The estimated prevalence of diabetes among adults in the Indonesia population is now 7.0% in 2017 [1]. Based on reported diabetes, the higher country is India in Asia [1, 2]. Diabetes one of the risk factors present in an individual; the higher the chance of that individual having diabetes without symptoms. Many people descendants of diabetes undiagnosed of T2DM. Ideally, screening before the patient reports symptoms [2-6].

Without screening, more any risk with risk undiagnosed T2DM [7] Screening for descendants of patient T2DM is not widely undertaken due to the high costs and did not have care health [8]. Screening is an asymptomatic test to classify a person for their likelihood of having a particular disease [7]. Screening would be more useful and efficient when directed at target populations at high risk [5, 9]. Besides, a high-risk population is generally more motivated to participate in screening programs and tend to follow up on the action if the recommendations positive results [9]. Screening descendants of T2DM are useful for the prevention of complications and early detection [5, 6, 10].

Recommended screening for type 2 diabetes because it is chronic, and patients often do not realize that the complaints that arise are clinical symptoms, so they are newly diagnosed diabetes if it appeared complications [7, 11]. Most patients with T2DM had complications (e.g., cardiovascular, kidney disease, etc.), and its complication is the leading cause of morbidity and mortality in these patients [12-14].

Screening diabetes mellitus is the primary of successful diabetes management for helping these patients to modify and reducing the risk factors of this complication [15]. As our best our knowledge, to date, many previous studies considering diabetes screening, no reporting screening among descendants of family diabetes, especially in Indonesia. This study was undertaken to screening the number of people in having risk high glucose descendants of T2DM. This approach has the advantage that the existence of early detection, prevent complication and intervention treatment for a high glucose level.

2. RESEARCH METHOD

2.1. Study setting and population

A cross-sectional study was done in June 2015 year. The population was a type 2 diabetic patients who went to the Panjatan II Public Health Center. The subjects were descendants of patients with type 2 diabetes, men and women, aged >20 years, issues have not been diagnosed by a health worker and willing to be a respondent. The determine sample size based error rate of 10% [16, 17], the prevalence of Panjatan II health center was 0.25%. The sample size was 62 respondents-locations of screening in Kulon progo District.

2.2 Data collection and analysis

In this study, income data were random blood glucose from venous blood. Method enzymatic used to auto analyzer Cobas C 111 as the gold standard. High glucose level was defined as having random blood glucose (RBG) reaches ≥200 mg/dl [1, 5, 18, 19]. We described the respondent's characteristics with percentages. We set high-risk factor TD2M is a high glucose level, and we identified who had a family history with T2DM (ex: mother, father, or both). Individuals with high glucose levels/hyperglycemic are significantly higher risk factor T2DM than glucose average [20, 21]. Early detection and prompt treatment method were recommended by WHO to reduce the burden of diabetes and complications [5, 22]. The study was approved by the Politeknik Kesehatan Yogyakarta research ethics committee number LB.01.01/KE-02/XXXV/767/2018.

3. RESULTS AND DISCUSSION

The result of this study showed that identifying people at high-risk factor T2DM (family history). A total of 62 respondents met the inclusion criteria for this study, which are 27 males and 35 females. Most of the respondents are in 31-40 years old and in borderline high of blood glucose level and have a factor of T2DM from mother. In our study, of high glucose level (30.6%), the rate of random blood glucose performers increased with age ≥40 years a had greater as shown in Table 1. Screening descendants of T2DM (family history) consist of 26 heads of families showed that the households (34.4%) with random blood sugar levels ≥200 mg/dL as shown in Table 2 include of T2DM family history of a father, mother or both as shown in Table 3.

Table 1. Baseline characteristics of sex, and age group (*n=62*)

Characteristics	Percentage (%)
Sex	
Men	43.54
Women	56.45
Age Groups	
20-30 years	14.52
31-40 years	33.87
41-50 years	29.03
≥ 51 years	22.58

Table 2. Random blood glucose level with autoanalyzer tests

A result from random blood glucose Test	Result test (%)
Desirable (<110 mg/dl)	30.6
Borderline high (≥110-199 mg/dl)	38.7
High (≥200 mg/dl)	30.7
Data are presented as percentages (*%).*	
All participants had a family history of T2DM.	

In our study, of high glucose level (30.6%), the rate of random blood glucose performers increased with age ≥40 years a had greater as shown in Table 3. Screening descendants of T2DM (family history) consist of 26 heads of families showed that the households (34.4%) with random blood sugar levels ≥200 mg/dL as shown in Table 2 include of T2DM family history of a father, mother or both. Screening should be more productive and efficient when directed at target populations at high risk. In addition, a high-risk population is generally more motivated to participate in screening programs and tend to follow the action if the recommendations positive results [4, 23].

Table 3. Distribution of the sample according to sex, and age

Characteristics	Blood random glucose ≥ 200 mg/dL Value (n)	%
Sex		
Women	10	16.1
Men	9	14.5
Age Groups		
20-30 years	0	0
31-40 years	5	8.0
≥41 years	14	22.5
Family History		
Father	1	3.8
Mother	4	15.3
Father and Mother	4	15.3

Several studies have been screening in various populations. The majority of previous research found that respondents recruited were not descendants of T2DM patients [7, 20, 24, 25], blood sugar levels were more often in pregnant women [1, 23, 26-28], children [29], HbA1c compared with oral glucose tolerance for T2DM patients and pre-diabetes [11], HbA1c for screening and diagnosis of diabetes mellitus [30]. This research was conducted in the population, and the sample size was more focused and specific. To the best of our knowledge, screening descendants of T2DM are widely yet done in a population-based on sample family history of T2DM patients. Therefore, the aim of this survey is expected to be able to detect early and prevent people with high-risk factor T2DM and complications. Our research has a few limitations that need to be discussed. The first is the level of low awareness concerning early detection, and health self so that in seeking participation requires more effort. The second mostly unexplored in population-based samples in Asian countries, such as Indonesia and no funder received. This study different from other research participation in early detection screening of T2DM [7, 1, 9, 19, 24, 28], this research screening followed of descendants (family history) T2DM. We documented the enzymatic test. This research also shows must be follow-up screening enables having a high risk of T2DM. Our study furthermore demonstrates the enormous potential of monitoring treatment having a high glucose level.

4. CONCLUSION

In this research screening descendant of type 2 diabetes mellitus in Kulonprogo district, we found 19 cases (29%) high random blood glucose level reaches ≥200 mg/dl and only 15.3% subjects indicated with mother history of this disease. This study has documented the need for preventive health to ensure the early detection of based on family history diabetes and initiation for treatment.

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