Early Detection of Suspected Systemic Lupus Erythematosus in Community-Dwellings in West Java Indonesia

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Abstract

Background: Prevalence of systemic lupus erythematosus (SLE) has been known in almost all countries around the world. Contrary to this, in Indonesia, neither a national epidemiologic study on SLE nor any direct study on SLE in the general population has been conducted. Early detection of SLE is needed as a first step to determine prevalence of SLE in Indonesia as well as to prevent further complications. This study aimed to obtain the prevalence of suspected SLE in community-dwellings.

Methods: This study was conducted in the period September to November 2015 and used the descriptive cross-sectional method. The respondents were people who were at least 18 years old and lived in selected blocks in three different villages in Jatinangor, West Java. Data were obtained from secondary sources of a previous SLE screening study that was incorporated in a study on "Epidemiology of hypertension and albuminuria in Jatinangor" in 2014, using the multistage sampling method. Suspected SLE was based on the Liang screening questionnaire. The collected data were presented in tables.

Results: There were 72 respondents (8%) suspected to have SLE. Most of the cases were female (Odds ratio:1.47) and 51–60 years old. The most clinical manifestation was painful swollen joints >3 months.

Conclusions: The existence of suspected SLE cases in Jatinangor's population, as an example of Indonesian population should be a concern so that examinations could be carried out to make sure that respondents with SLE can be provided prompt interventions to prevent further complications.

Keywords: Early detection, *liang* screening questionnaire, systemic lupus erythematosus

Introduction

Systemic lupus erythematosus (SLE) is a chronic multisystem autoimmune disease with broad clinical features, ranged from minor skin manifestation to serious organ damage.[1] Due to the SLE chronic features, the financial burden of SLE is expected to increase.[2–4] The annual healthcare cost in Asia for SLE patients without nephritis is estimated to reach US$16,638 per patient/year.[4]

The prevalence of SLE in Asia-Pacific countries varies between 4.3–45.3 per 100,000 population per year.[1] On the other hand, in Indonesia, neither an epidemiologic study on SLE nor any direct study on SLE in the general population has been conducted. The only available data are mostly obtained from local health care centers.

For those two reasons, SLE screening is needed as a first step to determine the prevalence of SLE in Indonesia. Systemic lupus erythematosus screening is one of the efforts which allows early detection of lupus; hence, immediate intervention of suspected SLE patients can be given, so that they will have a better life.

A previous multidisciplinary study has been conducted in Jatinangor, West Java, Indonesia to survey the health of communities in Jatinangor, including performing SLE screening. However, the previous SLE screening study has not been published yet. By using data of the mentioned study, this study aimed to obtain the number of people with suspected SLE in Jatinangor.

Methods

This study used secondary sources obtained from a previous SLE screening study

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entitled "Epidemiology of hypertension and albuminuria in Jatinangor" which has been conducted since 2014. This study utilized the previous data using the descriptive-observational method with a cross-sectional approach and was conducted in the period September to November 2015. This study was approved by the Health Research Ethics Committee, Faculty of Medicine, Universitas Padjadjaran.

The respondents of both the previous and this current study were the population of Jatinangor who lived in three different villages namely, Cipacing, Hegarmanah and Cilayung. The previous study used the multistage sampling technique as study design where samples were taken until the blocks were selected. The minimum sample size was calculated using sample size formula for descriptive categorical study. The assumed prevalence used in the calculation originated from a previous study in Birmingham, UK, which was 307 suspected SLE patients out of 1153 population (26,6%).[6]

Based on the formula, a minimum of 834 samples should be obtained. The data were selected randomly from the secondary source. The inclusion criteria of this study were (1) all people who were at least 18 years old, lived in the selected blocks, had already participated in the "Epidemiology of hypertension and albuminuria in Jatinangor" study, and (2) had already signed the informed consent paper. Those with incomplete data would be dismissed as an exclusion criteria of this study. The exclusion criteria of this study was based on previous studies in Birmingham and Israel which included only people who were at least 18 years old.[6,7] The total number of respondents of this study was 857 respondents.

The collected data on this study consisted of respondent demography (age and gender), and some of the answers toward the questionnaire given in the previous study was consistent with the Liang questionnaire. The Liang questionnaire comprised 10 questions concerning clinical manifestations of SLE which utilized the American Rheumatism Association preliminary criteria for SLE and had been validated as one of the two stages of SLE screening study design.[5,6] Data collection of the study was conducted by medical students as the surveyors who had previously received adequate training and standardized instructions from the experts.

Furthermore, the respondent demography was described in general, and then categorized into suspected SLE and not suspected SLE. The operational definition for suspected SLE is as follows: if there is a 'positive' or 'yes' answer on more than 3 questions of the Liang questionnaire, then the respondent would be categorized as suspected SLE.[5] The collected data were then presented in tables.

Results

Eight hundred and fifty seven valid data were obtained after the exclusion and inclusion criteria were met. The authors used all the valid data to increase the intensity of this study instead of using only the minimum samples. Among the total respondents, 69% were female respondents . The highest number was found in the age group 41–50 years (26%), followed by the age group 31–40 years (23%) (Table 1).

This study discovered that among the 785 respondents, approximately 8 % (72 cases) were suspected to have SLE (Table 2). The most common clinical manifestation in suspected SLE respondents was pain and swollen joints, which was found in 76% of the respondents. Most other clinical manifestations found in this study were changes on finger/toes, pleurisy for a few days and photosensitivity (Table 2).

The number of females with suspected SLE were higher compared to the number of males (55 out of 595 vs 17 out of 262 respondents) with 1.47 as the odds ratio. In addition, the highest number of suspected SLE was discoversed in the age group 51–60 years (Table 3).

Table 1 Demography Distribution of Respondents

Characteristics	Frequency (n(%))
Gender	
Male	262 (31%)
Female	595 (69%)
Age	
≤20	25 (3%)
21–30	118 (14%)
31–40	201 (23%)
41–50	225 (26%)
51–60	
>60	153 (18%)
135 (16%)	
Total	857

Table 2 Clinical Manifestations in Suspected Systemic Lupus Erythematosus Cases

Clinical Manifestations	"Y "Yes" responses in Suspected SLE (n(%))	"No" responses in Suspected SLE (n(%))
Painful swollen joints >3 months	55 (76%)	17 (24%)
Changes on fingers/toes (pallor,numb,uncomfortbale when it is cold)	49 (68%)	23 (32%)
Mouth ulcers >2 weeks	17 (24%)	55 (76%)
Low blood counts	25 (35%)	44 (61%)
Prominent rash on cheeks	10 (14%)	61 (85%)
Photosensitivity	34 (47%)	37 (51%)
Pleurisy for a few days	47 (65%)	25 (35%)
Proteinuria	5 (7%)	64 (89%)
Hair fall	14 (19%)	51 (71%)
Seizure/convulsion/fit	9 (12%)	63 (88%)

Note: * SLE = systemic lupus erythematosus

Table 3 Suspected SLE Patients According to Sex and Age Distribution

Sex anf Age Distribution	Suspected SLE (n)	No Suspected SLE (n)	Total (n)
Sex			
Female	55	540	595
Male	17	245	262
Age			
≤20	4	21	25
21-30	11	107	118
31-40	14	187	201
41-50	8	217	225
51-60	24	129	153
>60	11	124	135
Total	72	785	857

Discussions

This study discovered that the prevalence of suspected SLE in community dwellings using the Liang questionnaire was 8%. This is practically lower than the number found in previous studies which also used the Liang questionnaire as their screening tool. Geva et al.[7] reported that among 143 infertile women included in their study in Israel, 9.6% of the respondents answered 'yes' on more than 3 items in the Liang questionnaire. Another study conducted in Birmingham[6], UK, reported that 26.6% of 1153 respondents answered 'yes' on more than 3 items in the Liang questionnaire.

This low prevalence of suspected SLE might be due to several reasons. The dissimilarities of SLE epidemiology observed across the country might be associated with the differences in the majority of races in certain countries, source of cases and sampling method that were used in this study.

Furthermore, African-Caribbeans or black people has the highest risk of SLE compared to white people, Asian/Pasific and Hispanic race.8–12 Johnson et al. stated in the study of Somers et al.[8] that prevalence of SLE in Birmingham, UK, were much higher among

African-Caribbeans compared to the overall population. Moreover, methodological differences among studies such as different source of cases (e.g. hospital-based, population survey via mail or telephone, etc.) and sampling method can also create disparity in SLE occurences among countries.13

In addition, data of the previous SLE screening study conducted in Jatinangor was collected by surveyors who were still medical students. Although the students were given a standardized instruction previously, there might be still possibilities that the validity of manifestations complained by the respondents could not be confirmed, hence, making the number of suspected SLE cases to be less than in the other studies.

Most of the suspected SLE respondents were female. This finding was slightly similar to that reported in previous studies.[3,9–11,13] It was stated that SLE generally affects females, with a ratio compared to male in the range from 9–14:1.[13,14] This high number of female SLE patients was suggested by the role of estrogen, progesteron and prolactin hormones as well as X chromosome on the activation of immune system.[14,15]

The range of age group of suspected SLE respondents was more abundant in the range of an older age group. However, this was slightly different from the previous studies. Meacock et al.3 and Dancheko et al.[13] reported that the onset of SLE most typically occurs in women of childbearing age. This difference can be caused by the older age group who tends to have degenerative diseases, so the manifestations complained by respondents may represent other diseases rather than SLE.

Furthermore, painful and swollen joints were the most common SLE manifestations in this study. Somers et al.[8] reported that the most common clinical manifestations experienced by SLE patients in Michigan, US, were positive anti nuclear antibody (ANA), followed by arthritis in the second place. The difference of clinical manifestation frequency order from previous studies was related to the absence of ANA test performance in this study.

The methodology to conduct SLE screening study in the population does not necessarily stop by giving the Liang or other SLE screening questionnaire. The validated SLE screening study, currently, consists of a two-stage series design. The first stage is the administration of SLE screening questionnaire, the Liang questionnaire in this case, and then, it is continued with performing the ANA test on respondents who have answered the SLE screening questionnaire, previously mentioned, with more than three positive answers. Cut-off of three positive answers followed by ANA test performance has been proven to yield the best predictive value compared with the other cut-off.[5]

This two-stage series design fulfills the criteria of a good screening strategy, which is high in sensitivity, specificity, and positive predictive value on the tests that are used as the method for screening.[5] Administration of SLE screening questionnaire before performing ANA test will highly help researchers in conducting SLE screening study, especially in a large population. Executing ANA test in a large population will be very expensive and may produce a notable number of false positive results. ANA test will be more effective and efficient when it is applied to a smaller population selected by a less expensive screening test, such as the Liang questionnaire for example.[5]

The sampling method is one of the limitations of this study. The obtained samples may not represent the whole population because only the residents of each RT in each neighborhood (*rukun warga*, RW) of each village were included as respondents. Nevertheless, the selected villages in this study were big villages in Jatinangor and have a high number of residents compared to the other villages.

It can be concluded that the existence of suspected SLE cases in the population of Jatinangor is an example of the Indonesian population and should be a concern of the medical world. This findings should be followed by other studies conducted by other researchers who should perform physical examinations and ANA test to ensure that respondents who have SLE can be provided early interventions or medication to prevent complications.

References

1. Jakes RW, Bae SC, Louthrenoo W, Mok CC, Navarra SV, Kwon N. Systematic review of the epidemiology of systemic lupus erythematosus in the Asia-Pacific region: prevalence, incidence, clinical features, and mortality. Arthritis Care Res. 2012;64(2):159–68.
2. Cho J, Chang S, Shin N, Choi B, Oh H, Yoon M, et al. Costs of illness and quality of life in patients with systemic lupus erythematosus in South Korea. Lupus. 2014;23(9):949–57.

3. Meacock R, Dale N, Harrison MJ. The humanistic and economic burden of systemic lupus erythematosus. Pharmacoeconomics. 2013;31(1):49–61.
4. Mak A. The economic burden of systemic lupus erythematosus in Asia: the current state. Lupus. 2010;19(12):1442–6.
5. Liang MH, Meenan RF, Cathcart ES, Schur PH. A screening strategy for population studies in systemic lupus erythematosus. Arthritis Rheum. 1980;23(2):153–7.
6. Johnson A, Gordon C, Bacon P, Hobbs F. Undiagnosed systemic lupus erythematosus in the community. The Lancet. 1996;347(8998):367–9.
7. Geva E, Lerner-Geva L, Burke M, Vardinon N, Lessing JB, Amit A. Undiagnosed systemic lupus erythematosus in a cohort of infertile women. Am J Reprod Immunol. 2004;51(5):336–40.
8. Somers EC, Marder W, Cagnoli P, Lewis EE, DeGuire P, Gordon C, et al. Population-based incidence and prevalence of systemic lupus erythematosus: the Michigan lupus epidemiology and surveillance program. Arthritis Rheumatol. 2014;66(2):369–78.
9. Ferucci ED, Johnston JM, Gaddy JR, Sumner L, Posever JO, Choromanski TL, et al. Prevalence and incidence of systemic lupus erythematosus in a population-based registry of American Indian and Alaska Native people, 2007–2009. Arthritis Rheumatol. 2014;66(9):2494–502.
10. Feldman CH, Hiraki LT, Liu J, Fischer MA, Solomon DH, Alarcon GS, et al. Epidemiology and sociodemographics of systemic lupus erythematosus and lupus nephritis among US adults with Medicaid coverage, 2000–2004. Arthritis Rheum. 2013;65(3):753–63.
11. Lim SS, Drenkard C, McCune J, Helmick CG, Gordon C, DeGuire P, et al. Population-based lupus registries: advancing our epidemiologic understanding. Arthritis Rheum. 2009;61(10):1462–6.
12. Lim SS, Drenkard C. Epidemiology of systemic lupus erythematosus: capturing the butterfly. Curr Rheumatol Rep. 2008;10(4):265–72.
13. Dancheko N, Satia JA, Anthony MS. Epidemiology of systemic lupus erythematosus: a comparison of worldwide disease burden. Lupus. 2006;15(5):308–18.
14. Tan IJ, Peeva E, Zandman-Goddard G. Hormonal modulation of the immune system-a spotlight on the role of progestogens. Autoimmun Rev. 2015;14(6):536–42.
15. Tsokos GC. Mechanisms of disease: systemic lupus erythematosus. N Engl J Med. 2011;365(22):2110–21.