Health status of elderly based on daily activities living, cholesterol and uric acid profile in Medan city

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Abstract. Health problems in the elderly come from declining body cells, so the function and body endurance decreased along with increased risk factors for diseases. This study aimed to determine the elderly health status in Public Health Center of Tuntungan Medan. Health status includes measurement of daily activities living (DAL),and health parameter include blood pressure, blood sugar level (BSL), cholesterol level and uric acid level. The study design was descriptive with cross-sectional approach. The study population was the entire elderly population residing in the service area of public health center of Tuntungan Medan (55 subjects). The elderly who had a reasonable level of independence were 47 subjects (85.5%), the majority of elderly were in the category of hypertension stage I (20 subjects; 36.4%) with a mean systolic blood pressure level was 143mmHg. Most of them have BSL that exceeded the standard limit (42 subjects; 76.4%) with BSL mean value was 177mg/dL.Uric acid levels were in the high category (34 subjects; 61.98%) with a mean value of 7.0mm/dL, and most of them have normal cholesterol (43 subjects; 78.2%).

1. Introduction

Increasing Life Expectancy (LE) has become an indicator of development success as the country succeeds in developing the health and welfare of the population.[1] Increasing LE affects the number of elderly each year. Elderly is someone who has reached the age of 60 (sixty) yearsand above. Life expectancy in Indonesia is also changing. In 2000, LE in Indonesia was 64.5 years, and this number increased to 69.65 years in 2011. In 2012, the percentage of elderly population in Indonesia reached 7% and will continue to improve to 11.34% by 2020.[1]

Changes due to aging process occur in various physical, mental, and social aspects. The most prominent social change with increasingly aging is the inability to care for themselves regarding daily activities living such as bathing, urinating/defecating, dressing, combing hair, and eating. So gradually they need assistance by a caregiver both informal and formal.[2] As long as aging, the body cells become more insulin-resistant, reducing the elderly's ability for glucose metabolism, increasingly elderly population, the number of patients with hypertension is likely to increase.[3] Also, postural balance disorder occurs in older adults. It has resulted in difficulties to conduct daily activities living (DAL) independently. Morghental [4] estimates that 17% of the elderly who do not live in institutions have a problem in performing basic DAL (eating, dressing, bathing, toileting, transferring and walking) and instrumental DAL (such as preparing food, shopping, managing money, making phone

calls, and doing housework). This situation undoubtedlyhas an impact on the quality of life.[4] This study aims to describe the elderly health status residing in the service area of public health center of Tuntungan Medan. We determined the health status based on DAL and health parameters include blood pressure, blood sugar level, cholesterol level and uric acid level.

2. Method

The study design is descriptive with cross-sectional approach. The population is all elderly (aged $\geq$ 60 years old) located inthe service area of Public Health Center of Tuntungan Medan that routinely conducts health examination in July-August 2017 amounted to 55 persons. The research ethics committee at the Faculty of Medicine of Universitas Sumatera Utara approved the study protocol, and all participants willing to participate in the study signed a written informed consent. Sources of research data were primary data by interviewing and analyzing the blood sample. DAL measurements were done by interview and direct observation of functional independence regarding self-care and mobility. DAL measurements using the Barthel Index scale with ten items assessment which is: eating, bathing, grooming, dressing, bladder and anal control, toileting, seat/bed transferring, mobility and using stairs, each evaluation. It has scored: 0=unable, 1=need help, 2=Independent, a total score of the score results ranged from 0 (entirely dependent) to 100 (total independent). Blood pressure measurement using mercury sphygmomanometer and stethoscope was after the elderly rested for 10 minutes. The cholesterol and uric acid levels were by usinga multi-functional portable device using peripheral blood sampling. Data processing used SPSS computer program and displayed in frequency distribution table.

3. Results

3.1. Characteristics of the elderly based on age and gender and education

Table 1. Subject characteristics.

Characteristics	n	%
Age group		
Young old : 60-74 years	51	92.8
Middle old: 75-90 years	4	7.2
Oldest old: > 90 years	0	0
Gender		
Male	9	16.4
Female	46	83.6
Education Level		
Not completed in primary school	1	1.8
Graduated from primary school	21	38.2
Junior High School	13	23.6
Senior High School	16	29.1
College	2	3.6
Total	**55**	**100**

Table 1 showed that the majority of elder people in this study is in the young.Elderly group: 60-74 years old as many as 51 people (92.8%), most of them were women as many as 46 people (83.6%), and most of them had primary school education background as many as 21 people (38.2%).

3.2.Activity Daily Living Level Description of Elderly

Table 2. Daily activity living level of elderly.

Activity Daily Living Level	n	%
Independent	47	85.5
Light Dependency	8	14.5
Total	**55**	**100.0**

In Table 2, we can see that the majority of older adults can do their daily activities independently as many as 47 people (85.5%).

3.3. Description of Elderly Blood Pressure

Table 3. Systolic blood pressure of elderly.

Blood Pressure	n	%
Normal	8	14.5
Pre Hypertension	12	21.8
Hypertension stage I	20	36.4
Hypertension stage II	15	27.3
Total	**55**	**100**

Table 2 showed that 36.4% study subjects had systolic blood pressure categorized in Hypertension stage I. The mean value of systolic blood pressure was 143mmHg. Only 14.6% study subjects had average systolic blood pressure, while 27.3% had hypertension at any stage.

3.4. Description of Blood Sugar Level (BSL) during elderly

Table 4. Blood sugar levels in elderly.

Blood Sugar	n	%
Normal (< 90mm/dl)	2	3.6
Suspected hyperglycemia/high risk to diabetes (90-199mm/dl)	42	76.4
Diabetes (>200mm/dl)	11	20
Total	**55**	**100.0**

The study result demonstrated that 76.4% study subjects had BSL exceed the standard limit and suspected of having diabetes, with the BSL mean value was 177 mg/dL. The results also showed 11 subjects (20%) had diabetes.

3.5. Uric Acid Levels Description of Elderly

Table 5. Uric acid levels in elderly.

Uric Acid	n	%
Normal (<5.5mm/dl)	21	38.2
High (>5.5mm/dl)	34	61.8
Total	**55**	**100.0**

Results of Table 4 showed that 61.8% elderly in the population study had high uric acid levels with a mean value of 7.04mm/dL.

3.6. Total cholesterol Levels Description of Elderly

Table 6. Total cholesterol levels of elderly.

Cholesterol	n	%
Normal (≤ 200mg/dl)	43	78.2
Hypercholesterolemia (>200 mg/dl)	12	21.8
Total	**55**	**100.0**

Results in Table 5 showed that the majority of elderly have average total cholesterol levels as many as 43 people (78.2%) with a mean value of 157.25mg/dL. Only 12 people (21.8%) had hypercholesterolemia.

4. Discussion

Daily Activity Living (DAL) is a fundamental skill and occupational task that a person has to take care of himself independently in his daily life to fulfill his/her role as a person, in family and society.[5] This study found that 85.5% study subjects had DAL level as an independent. This finding is by Adhira [6] which found 66.7% elderly had independent in DAL level, while Hermanti [7] found only 42.2% elderly alone who got the level of DAL classified as independent. Based on assessed items of independent, this study found that the functional ability of elderly eating independently is 93.6% (53 subjects), bathing alone 100% (55 subjects), clothing independently 98.2% (54 subjects). For self-care independently 96.4% (53 subjects), going to toilet independently 76.6% (36 subjects), moving or walking independently 76.6% (36 subjects), controlling urination and defecation independently 94.5% (52 subjects), dressing independently 98.2% (54 subjects), toileting independently 100% (55 subjects). 98.2% (54 subjects) had independent DAL level in mobility item and ability going up-stair item.

This study found that the majority of elderly had systolic blood pressure categorized in Hypertension stage I. The results of this study are in line with the study of Babatsikou [8] which stated that the prevalence of hypertension in the elderly was 50%-72%. Hypertension occurs in more than two-thirds of individuals after the age of 65 years. Data from the Framingham Heart Study, in men and women without hypertension at age 55, showed that they would still be at risk for hypertension until age 80 years, 93% and 91% respectively. In other words, more than 90% of the free-hypertension individual at the age of 55 years will have increased risk of developing hypertension throughout their lives. The prevalence of hypertension is less in women than men up to the period of 45 years old, similar in both sexes from 45 to 64 years old and much higher in women than men over 65 years old.[3,9]

This study found that the majority of elderly had BSL exceed the normal limit and suspected of having diabetes. This result was similar to Novida study [10] which got 19 of 72 subjects (26.4%) also had diabetes, 74.5% (41 subjects) had BSL categorized as suspicious hyperglycemia. Although they were just suspected Diabetes Mellitus, this group had a high risk of becoming DM if it is not immediately controlled, and in general, theperson who has BSL above standard limit is at risk of having diabetes. Age is one of the risk factors for impaired glucose tolerance. Impaired glucose tolerance can be caused by a decrease of insulin secretion by pancreatic beta cells or decreased glucose uptake by target cells. WHO said that every decade of lifespan, fasting blood sugar levels will rise by about 1-2 mg/dl and 5.6 to 13mg/dl at 2 hours after ameal.[10] A study in America showed among adults aged ≥65 years, the prevalence of diabetes was 15.3%, representing 5.4 million individuals in the United States. The number of studies that evaluate the incidence and prevalence of type 2 diabetes in the elderly population is increasing.[11] The latest Health and Nutrition Survey, HANES III, showed that about 20% of the population have diabetes at age 75 and half of these patients are unaware they have the disease.[11]

This study found that about 61.8% elderly in the population study had high uric acid levels with a mean value of 7.04 mm/dL. The results of this study in line with research conducted by Nengsi [12], which found 66 samples (66.7%) have high uric acid levels. The study also found an association

between high purine intake of >1000mg per day with the incidence of gout arthritis. Increased prevalence of high uric acid in the blood (hyperuricemia) also occurs in Taiwanese society, the incidence of hyperuricemia is also associated with ametabolic syndrome that happens in their older adults.[13] Hyperuricemia is prevalent in older adults and more common in senior men than in senior women, the proportion of hyperuricemia is 57.3% in men and 40.9% in women.[14] Hyperuricemia is associated with the incidence of Heart Failure in adults living in the community. Cumulative data from our subgroup analyses show that this association is significant when hyperuricemia is a sign of increased xanthine oxidase activity but not if hyperuricemia is caused by impaired loss of uric acid.[15]

The prevalence of hyperuricemia in the study populationdoubled over a 10-year period. When grouped by age, there was an increase in prevalence among group over 65 years old in both sexes. Although the prevalence of gout increases in both sex over a 10-year period, men still have most of the burden of disease. At age under 65 years, men have a prevalence four times higher than women (4:1), but in the older age group (>65), the gender gap narrows to 1 woman for every three men with hyperuricemia (ratio 3:1).[16] High protein consumption can obtain high points of uric acid due to uric acid metabolism from purine (protein), another thing that can cause hyperuricemia is kidney disorders secondary to other diseases. Increased uric acid can cause a gout arthritis that will disrupt the quality of life in the elderly. Therefore, it is necessary to manage the diet and other evaluation so it will not become a new health problem in the elderly.

This study found that the majority of elderly have average total cholesterol levels as many as 43 people (78.2%) with a mean value of 157.25mg/dL. The results of this study are by research conducted by Khairani [17] which found hypercholesterolemia in 23.5% of the total respondents. The study also found that women had a risk 2-6 times greater than men to get cholesterolemia. Another study conducted in Bantul area obtained hypercholesterolemia prevalence of 15.9% [18] while the prevalence of hypercholesterolemia in rural China was 17.7%.[19] High cholesterol level in the elderly can be influenced by the consumption of high-fat foods and declining in physical activity so that the risk of hyper cholesterol is increasing. Another cause is the presence of underlying diseases, such as diabetes and kidney disorders. Increased cholesterol levels will increase the risk of cardiovascular disease that will increase morbidity and mortality of the elderly. According to Greenland et al [20], the results of cholesterol level measurement using capillary plasma are always higher, and it is advisable to give a 39 mg/dl difference, so if the measurement using venous blood sample, the average outcomes may be lower.

5. Conclusions

We concluded that the health status of elderly in Public Health Center of Tuntungan is in a proper category, although on the laboratory examination and blood pressure found more elderly have anabnormal result. Therefore it is necessary to make health promotion efforts and early detection of elderly health problems that can be in an integrated service program for elderly called integrated health service for elderly,where They will get an education and proper treatment for all health problems experienced by the elderly so that the quality of life of the elderly become better.

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