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Proinflammatorycytokines profile On Skin Aging In Jemursari Islamic Hospital

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A B S T R A C T : Aging is a complex process and make progressive loss of functional capacity of organ such as skin. There is an imbalance of immune system in skin aging. Proinflammatory cytokines such as IL-6 and TNF-α were elevated in skin aging.**Purpose:**This study aims to observe about proinflammatory cytokines on skin aging in Jemursari Islamic Hospital. **Methods:**This research is an observational study with cross sectional design. The IL-6 and TNF-α level was measured by using sandwich ELISA technique. **Results:** The mean level of IL-6 and TNF-α in subjects aged 56-75 years were 19,99 ng/ml and 2,86 ng/ml, respectively. Those were higher than aged 45-55 years. In males group, IL-6 was more elevated than females group. Meanwhile in females group, TNF-α was more elevated than in males group.The mean level of IL-6 and TNF-α in overweight groups were more elevated than normal BMI groups. **Conclusion:** Subjects in Jemursari Islamic hospital had elevated IL-6 and TNF-α level.However, there wasneeded a much further research inorder find correlation between skin aging and proinflammatory cytokines.

Keywords: Skin aging, IL-6, TNF-α.

I. INTRODUCTION

Aging is an unavoidable and complex process characterized by progressive loss of functional capacity of organ such as skin. This biological phenomenon happensoverlapping between internal(genetic, hormonal) and environmental (ultraviolet, pollution) factors(Chung, Cho and Kang, 2004; Assaf, Adly and Hussein, 2010; Minciullo et al., 2016; Garg, Khurana and Garg, 2017). Recently,people in all the world aged 60 years or over are increasing rapidly. This phenomenon will spend high costs of medical care for the elderly(Kovaiou, Weinberger and Grubeck-Loebenstein, 2008).

Manifestation of skin aging both intrinsic and extrinsic include wrinkles, skin atrophy, telangiectasis, solar lentigo, premalignant skin lesions, skin inelastic and rigid, and leathery appearance(Yaar, 2006; Yaar and Gilchrest, 2012; Tobin, 2017). The immune system of aging or known as immunosenescenceundergoes decreases, with major implications for health and survival(Mansouri et al., 2014; Simon, Hollander and McMichael, 2015). 'Inflammaging'' has become widely used to describe inflammatory process of aging and is characterized by low-grade, chronic pro-inflammatory state. During this process, the balance of cytokines such as interleukin-6 (IL-6) and tumor necrosis factor-α (TNF-α) are elevated (Brüünsgaard and Pedersen, 2003; Milan-Mattos et al., 2019).Interleukin-6 are commonly found in middle aged population than TNF-αwhich is more found in age 80 years or above (Brüünsgaard and Pedersen, 2003). This research was conducted because no study had studied yet about proinflammatory cytokinesprofile on skin aging patients in Jemursari Islamic Hospital Surabaya.

II. METHODS

This research is an observational study with cross sectional group design. It was conducted at our hospital and was approved by the hospital's ethics committee.The study was comprised of 19 healthy subjects. Anthropometric measurements including weight (in kg) and height (in cm) were measured in all subjects. Body mass index (BMI) was calculated using the formula: weight (kg)/height^2 (m^2).The subjects were eligible for inclusion if they were aged 45 years and above, had skin aging sign in this research we observed any wrinkle both static and dynamic wrinkle. The subjects did not have any past histories of kidney abnormality, hypotiroid, malignancy, hypertension, diabetes mellitus, cardiovascular disease,tructive biliary and HIV. They also did not have any skin abnormality and did not consumed any medication within a month before this research was conducted. IL-6and TNF-α level measurement were assessed by sandwich ELISA technique in Biochemistry laboratory, Faculty of Medicine, Brawijaya University.The research procedure is as follows:

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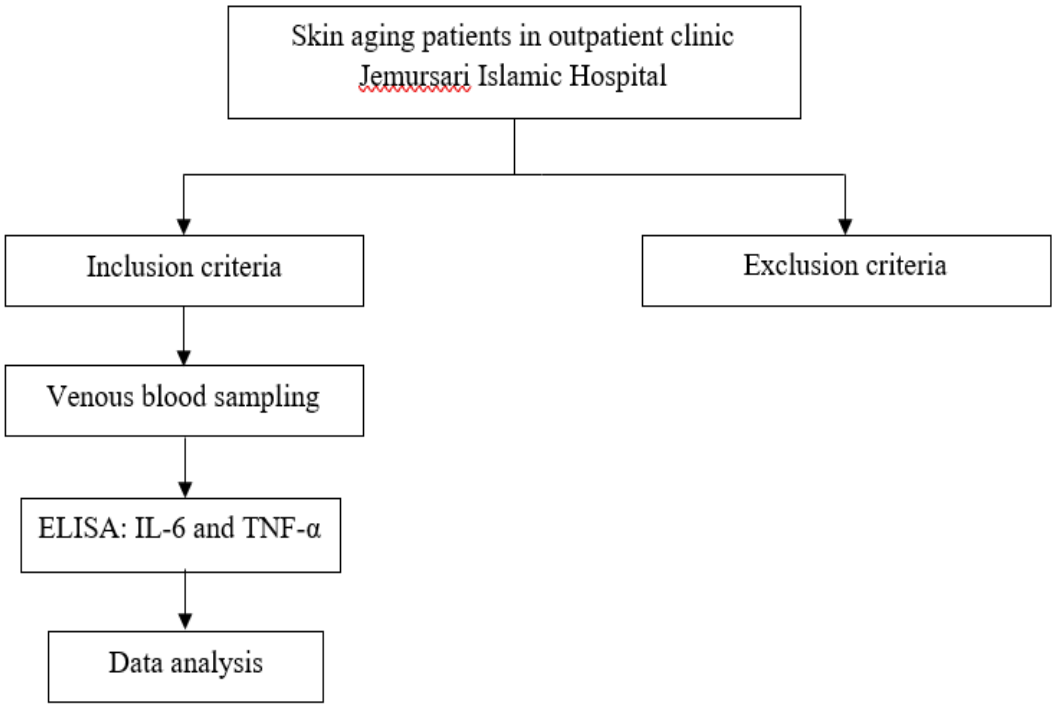

Figure 2. Research Procedure

Data were collected from the research status, then performed cleaning, editing and coding. The data that was collected were entered in the Statistical Package for the Social Sciences (SPSS) data format version 20.0 (SPSS, Inc., Chicago, Illinois).The main outcome measures in this study were IL-6and TNF-α level. The statistical test used was the normality test with the Shapiro-Wilk test because the sample number was smaller than 30 per group and the data were normally distributed ($p > 0.05$).

III. RESULTS

Based on this research, the subject distribution based on age was divided into 2 groups, 45-55 years group and 56-65 years group. The mean value of IL-6 in skin aging patients in Jemursari Islamic Hospital Surabaya were 18,51 ng/ml for ages 45-55 years group and 19,99 ng/ml for ages 56-65 years. The mean value of TNF-α in skin aging patients in Jemursari Islamic Hospital Surabaya were 2,36 ng/ml for ages 45-55 years group and 2,86 ng/ml for ages 56-65 years (Table 1). This study also comprised of 9 (47,4%) males and 10 (52,6%) females. The mean value of IL-6 in males were 19,52 ng/ml and females were 19,09 ng/ml. The mean value of TNF-α for males were 2,48 ng/ml and females were 2,75 ng/ml (Table 2). The BMI of subjects was found in normal value (68,4%) and overweight (31,6%). The mean value of IL-6 in normal group were 18,56 ng/ml and overweight group were 20,89 ng/ml. The mean value of TNF-α in normal group were 2,45 ng/ml and overweight group were 2,99 ng/ml (Table 3).

Table 1. Subject distribution based on age

Age (Year)	N	%	Mean of IL-6 ng/mL	Mean of TNF-α pg/ml
45-55	9	47,4	18,51	2,36
56-65	10	52,6	19,99	2,86
Total	19	100,0		

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Tabel 2. Subject distribution based on sex

Sex	N	%	Mean of IL-6 ng/mL	Mean of TNF-α pg/ml
Males	9	47,4	19,52	2,48
Females	10	52,6	19,09	2,75
Total	19	100,0		

Table 3. Subject distribution based on BMI

Body Mass Index	N	%	Mean of IL-6 ng/mL	Mean of TNF-α pg/ml
Underweight	0	0	0	0
Normal	13	68,4	18,56	2,45
Overweight	6	31,6	20,89	2,99
Obese	0	0	0	0
Total	19	100,0		

IV. DISCUSSION

Our results show that the mean value of IL-6 and TNF-αin older group (56-65 years) were found more elevated than younger group (45-55 years). In accordance with ours,Ye et al.(2019)also found that IL-6 and TNF-α were significantly elevated in chronologically aged individuals than young human controls.Lumentut, Marunduh and Rampengan(2015)found that TNF-α level in age 64-74 years and >90 years were more elevated than age 75-90 years. Wu et al.(2007) also found the same results but in mouse adipose tissue not in aging human. The proinflammatory cytokines are regulated by NF-κβ signalling pathway which are activated in aging.This signalling pathway will release proinflammatory cytokines such as IL-6 and TNF-α.

The mean value of IL-6 in males group (56-65 years) in this research were found more elevated than females group (45-55 years). Otherwise mean value of TNF-α in females group were more elevated than males group. These results were not similar with Lumentut, Marunduh and Rampengan (2015) who found that TNF-α level in males group were more elevated than female group. Milan-Mattos et al.(2019) found that IL-6 and TNF-α in 41-70 years females group showed more elevated than males group.

Aging is also related with body composition and it can be measured with BMI. Several studies found that obesity is associated with increased proinflammatory cytokines (Brüünsgaard and Pedersen, 2003). Our resultsshow that the mean value of IL-6 and TNF-α were more elevated than normal BMI group.Azizian et al.(2016) and Ashraf et al.(2018)showed that value of IL-6 and TNF-α were not significantly difference in age 47-49 years old obese and non-obese patients with metabolic syndrome.

V. CONCLUSION

Based on our results, we have shown proinflammatory cytokines changes in skin aging patients in Jemursari Islamic Hospital include IL-6 and TNF-α level. Those cytokines were elevated in older group, males group and overweight group. Our limitation that we did not measure grading of skin aging and next research will find correlation between variables.

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