Inflammatory Effect of Interleukin – 6 and C – Reactive Protein in Development of Stroke in Tikrit City

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ABSTRACT
This study was conducted in Tikrit city for the period from February 1, 2018 to June 1, 2018, where the study included 50 patients with stroke who attended to Salah Al-Din general hospital in Tikrit city. The study also included 50 healthy subjects as control group. The study included the collection of 3 ml of venous blood for measurement of interleukin-6 by using ELISA technique (Koma-Biotech, Co, USA) and C-reactive protein. The study showed that the highest mean of IL-6 was recorded in patients under stroke (26.71±3.11 pg/ml) as compared with healthy control (11.18±2.21pg/ml) at P. value <0.01. The study showed that the maximum mean of CRP was recorded in patients under stroke (5.22±0.21 mg/dl) as compared with healthy control (1.01± 0.17 mg/dl) at P. value <0.01. The study   significant relation of

type of stroke with IL-6 and CRP levels as the highest mean levels of IL-6 and CRP were recorded in patients under severe stroke and the lowest mean were in patients under mild stroke (P<0.01).The study showed significant relation of IL-6 and CRP levels with stroke.

Keywords: Stroke; IL-6; CRP; anti-conversant; Inflammatory

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INTRODUCTION

The major risk factors for an ischemic stroke and carotid artery disease are the same. They include: High blood pressure: This is the primary cause of stroke [1]. Diabetes: People with diabetes are four times more likely to have carotid artery disease. Inflammatory biomarkers serve as immune system health indicators, and in vascular research, elevated levels support evidence of ongoing disease processes that can upregulate atherosclerosis or induce prothrombotic states[2]. Cytokine profiles produce snapshots of dynamic and complex immune system responses to the milieu of acute and chronic stimuli[3]. High-sensitivity C-reactive protein (hsCRP) is one of the most investigated cytokines in cardiovascular research and has been found to predict ischemic stroke (IS) in some but not in all populations. Interleukin-6 (IL-6) is a proinflammatory cytokine similarly associated with increased vascular risk, but it is also paradoxically linked to anti-inflammatory molecules through complex autoinhibitory feedback mechanisms[4,5]. Inflammatory biomarkers serve as immune system health indicators, and in vascular research, elevated levels support evidence of ongoing disease processes that can upregulate atherosclerosis or induce prothrombotic states. Cytokine profiles produce snapshots of dynamic and complex immune system responses to the milieu of acute and chronic stimuli. High-sensitivity C-reactive protein (hsCRP) is one of the most investigated cytokines in cardiovascular research and has been found to predict ischemic stroke (IS) in some but not in all populations[5,7]. Interleukin-6 (IL-6) is a proinflammatory cytokine similarly associated with increased vascular risk, but it is also paradoxically linked to

anti-inflammatory molecules through complex autoinhibitory feedback mechanisms [8-10]. So, The aim of the study was to evaluate effect of interleukin-6 and C-reactive protein on the development of stroke.

MATERIAL AND METHOD

This study was conducted in Tikrit city for the period from February 1, 2018 to June 1, 2018, where the study included 50 patients with stroke who attended to Salah Al-Din general hospital in Tikrit city. The study also included 50 healthy subjects as control group. The study included the collection of 3 ml of venous blood for measurement of interleukin-6 by using ELISA technique (Koma-Biotech, Co, USA) and C-reactive protein. The study also included taking of full information from cases like living situation, age. The study was approved by the patients participating in the study in writing. And the cases of thrombosis in patients were known through the pathological papers of the medical cases received at Tikrit Teaching Hospital. included measuring the level of blood pressure for people as well as measuring the level of blood sugar in patients and healthy people. It was confirmed that all patients and healthy people do not suffer from incurable diseases or cancerous tumors and do not use a treatment that reduces immunity or antihistamines because it may affect the levels of variables that were conducted in this study.

STATISTICAL ANALYSIS

Computerized statistically analysis was performed using Mintab ver 18.0 statistic program for determination of the *P.* value (P<0.05: significant).

FINDINGS

Table 1: Risk factors of stroke in cases and controls

Variables	Stroke patients		Healthy control	
	No.	%	No.	%
Mean age(years)	58.5±4.4		51.5±4.3	
Smoking	31	62	20	40

Hypertension	35	70	24	48
Atrial fibrillation	7	14	1	2
DM	16	32	7	14

The study showed that the highest mean of IL-6 was recorded in patients under stroke (26.71±3.11 pg/ml) as compared with healthy control (11.18±2.21pg/ml) at P. value <0.01 , (Table 2)

Table 2: Mean of IL-6 among the study groups.

IL-6 level (pg/ml)	Cases	Healthy control
No.	50	50
Mean	26.71	11.18
SD.	3.11	2.21

P<0.01

The study showed that the maximum mean of CRP was recorded in patients under stroke (5.22±0.21 mg/dl) as compared with healthy control (1.01± 0.17 mg/dl) at P. value <0.01, (Table 3)

Table 3: Mean of CRP among the study groups.

CRP level (mg/dl)	Cases	Healthy control
No.	50	50
Mean	5.22	1.01
SD.	0.21	0.17

P<0.01

The study   significant relation of type of stroke with IL-6 and CRP levels as the highest mean levels of IL-6 and CRP were recorded in patients under severe stroke and the lowest mean were in patients under mild stroke (P<0.01) (Table 4).

Table 4: Distribution of isolated bacteria among study groups.

Type of stoke	N.	IL-6 (Mean±SD)	CRP (Mean±SD)
Mild		17.51±4.9	3.91±2.2
Moderate		22.22±5.8	5.13±3.9
Severe		30.17±7.2	8.13±4.1
P. value		0.001	0.001

DISCUSSION

 In light of the results that appeared in this study, which sho that the level of interleukin-6 and CRT was high in patients with cardiac tension in comparison with the control group, there are several studies that proved in the relationship, since a past study conducted showed that the level of interleukin-6 was relatively high in the group of Stroke comparison was the control group, and the interleukin-6 level was also high in that group[11]. Interleukin-6 is a multi-effect cytokine that participates in controlling the immune response in most cases of trauma, including patients with title muscle infarction, patients with hypertension, pulmonary thrombosis and diabetes, as well as regulating bone metabolism [12]. Interleukin-6 has a close relationship with patients with thrombosis in the blood vessels, as shown by two different studies [13,14]. Studies also show that C-reactive protein also has a relationship with title and vascular patients in harmony with acute injuries such as respiratory and urinary tract infections [15,16]. Moreover, their elevation can indicate mortality in these diseases, especially since these high rates are positively correlated with the type and degree of socket clot[17]. In our study, people with high levels of interleukin-6 and high levels of C-reactive protein had significantly greater levels than in healthy people, indicating that their elevation had a future effect on the development of these diseases[10]. This may indicate the high levels of protein interleukin-6 and C- to acute inflammation that may have occurred due to the low level of immunity and immune response in these people, especially since the liver is responsible for making these proteins, which are controlled by lymphocytes in the serum of those patients[15]. However, it is possible that high levels of the interacting protein levels between interleukin-6 and C are indirect indicators of other conditions encountered which increase the risks such as acute injuries associated with patients with hypertension and diabetes[16]. As mentioned in this study, a high percentage of patients were smokers and were suffering Diabetes and hypertension as catalysts for thrombosis. The inflammation may be caused by infectious causes of atherosclerosis [17]. The largest reactive protein levels determine those at risk for cardiovascular disease. High levels of interleukin-6 circulating in severe congestive heart failure are reported as prognostic indicators in multiple myeloma [19]. Higher interleukin-6 levels may also reflect cellular damage, such as oxidative stress [20]. Finally, interleukin-6 may interfere with tumor necrosis factor-α and interleukin-1 levels so that higher interleukin-6 levels reflect damage than other cytokines. When contrasted and codominance, the hsCRP prevailing status demonstrates expanded danger of IS among white and Hispanics however not among blacks. The opposite relationship of IL-6 predominance was available just among blacks[8,21]. The impact adjustment might be a result

of the variable appropriations of CRP and IL-6 qualities across race-ethnic gatherings (blacks had the most elevated upper quartile ranges for CRP and IL-6), however the utilization of race-explicit quartiles to make the fiery develop (instead of companion explicit quartiles) didn't change the noteworthy by and large affiliations or the nearness of impact alteration by race-ethnicity (information not appeared) [22]. The frequency of IS in the codominance bunch was higher in blacks when contrasted and that in whites or Hispanics, proposing heterogeneity by race-ethnic subgroup might be driven by our referent classification[9]. This impact change needs further examination to comprehend whether variable IS chance is a result of information appropriations by race, homogenous impacts in reference classification after specific limits, or social factor middle people of race-ethnic status that alter the relationship of irritation and stroke chance [8,13].

CONFLICT OF INTEREST
Non

SOURCE OF FINDINGS
Self-findings.

ETHICAL CLEARANCE
This research was carried out with the patient's verbal and analytical approval before the sample was taken

CONCLUSION
The study showed significant relation of IL-6 and CRP levels with stroke.

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