

## Assessment of PT, APTT, fibrinogen level among Sudanese patients with Systemic lupus erythematosus

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### Abstract:

**Objective:** To investigate the coagulation status among Sudanese patients with systemic lupus erythematosus by evaluating PT, APTT and fibrinogen level.

**Methods:** A total of 30 patients with SLE were included in the study ...18...patients (60 %) had history of arterial and /or venous thrombosis and ...12...patients (40 %) did not have such history. Platelet poor plasma from 30 healthy controls were examined. Prothrombin time (PT), activated partial thromboplastin time (APTT) and fibrinogen level were evaluated.

**Result:** Fibrinogen levels were significantly higher in patients with SLE than controls. The PT in patients with SLE (12.0 +/- 1.1%) was not significantly different in comparison with controls (12.1 +/-1.5 Seconds). Whereas APTT was significantly higher in patients than in controls (40.8+/- 5.4seconds).

**Conclusion:** In this study I confirmed the presence of disturbances of coagulation process and more common the developing of thrombosis rather than bleeding in patient with SLE.

**Key words:** fibrinogen level, Sudanese patients, Systemic lupus erythematosus

## **1. INTRODUCTION**

SLE is the most common multisystem connective tissue disease it is characterized by a wide variety of clinical features and presence of numerous auto-antibodies, circulating immune complexes and wide spread immunologically determined tissue damage (1, 2). The cause is believed to be environmental trigger which result in a misdirected immune response in people who are genetically susceptible(3).

Hematological abnormalities are common in SLE. All the cellular element of the blood &coagulation pathway can be affected in SLE patient.

The major hematological manifestation of SLE are: anemia, Leucopenia, thrombocytopenia and anti phospholipid syndrome.

Antibodies to a number of clotting factors including: VIII, IX, XI, XII and XIII have been noted in patient With SLE (3,4)

These antibodies may not cause abnormalities of in vitro coagulation test but may cause bleeding.

Much more common are APL (anti phospholipid Ab) the presence of which have been associated with prolongation of APTT and increase risk of arterial and venous thrombosis, thrombocytopenia and fetal loss (5, 6).

Antibody to other phospholipid and to phospholipid binding proteins (e.g. anti cardiolipin antibodies) in moderate or high level, may also be associated with these clinical phenomena. When Apl occur in association with one or more of these clinical features in patient with SLE it suggests the presence of Aps.

### **JUSTIFICATION & OBJECTIVES:**

#### **General objective:**

To evaluate PT, APTT and fibrinogen level among Sudanese patients with SLE.

**Specific objectives:**

1. To assess PT, APTT and fibrinogen level by using coagulometer
2. To detect the disturbance in coagulation process
3. To correlate between this parameters and the clinical course of the disease

**MATERIAL & METHODS:**

**Study population:**

The study group comprised 30 Sudanese patients with SLE who were admitted for routine visit to our immunologic department of Omdurman hospital.

The main characteristic are:

1. All patients are female
2. The age (21 -45) years
3. Duration of the disease (3-5) years

None of the patients were receiving oral anticoagulants at the time of entry study.

The control group consisted of 30 age and sex –matched healthy Sudanese blood donor.

(18) Of the patients (60%) had history of thrombosis (deep venous thrombosis, pulmonary embolism and arterial thrombosis.

(2) Of the patients (7%) had a history of bleeding.

(10) Of the patients (33%) had history of recurrent mischarge.

All subjects gave informed consent before entering the study.

**Laboratory testing:**

All samples were coded and each specific test was performed in the same laboratory throughout the study.

Each session of laboratory tests included either study controls or laboratory control represented by pooled plasma.

### **Plasma Samples:**

In all patients, blood samples were obtained using vacuum tubes containing 0.015ml buffered sodium citrate solution .plasma samples were obtained by centrifugation at 2000 g for 15 min.

\*PT, APTT and fibrinogen were performed on the Bio base clot detection system (Asspanian Diagnostic Instrument ).

### **PT:**

Evaluated by using uniplastin R (Tulip diagnostics (P) LTD) is anoval, highly sensitive liquid calcified thromboplastin reagent which derived from rabbit brain.

\*Normal Range: (11 - 15) seconds

### **APTT:**

Evaluated by using liquicelin-E (Tulip diagnostics (P) LTD) is a liquid ready to use activated cephaloplastin reagent which is phospholipid prepration derived from rabbit brain with allagic acid as activator.

\*Normal Range: (22 – 35) seconds

### **Fibrinogen level:**

The evaluation of fibrinogen level was performed with Multi fibrin\*U kits(Siemens Health care Diagnostics ) which permits a quantitative determination of fibrinogen level in plasma by using the modification of the clauses method .

\*Normal Range: 1.8 – 3.5 g/l

### **Statistical analysis:**

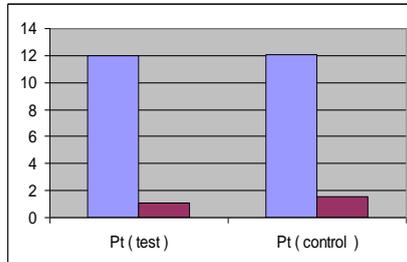
Statistical analysis was performed using Statistical package for social science (SPSS) software. Evaluation of patient's data was performed using the T- test. Result with P value less than 0.05 were considered statistically significant.

## RESULTS:

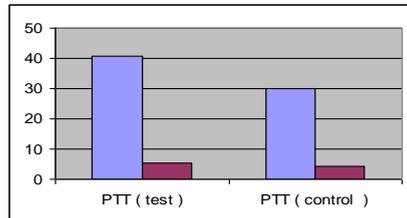
The PT in patient with SLE ( 12.0 +/- 1.1 % ) Seconds was not significantly different in comparison with controls (12.1 +/- 1.5 % )Seconds ( P : 0.00) whereas APTT was significantly higher in patients than in controls ( 40.8 +/-5.4seconds) (30 +/- 4.2%seconds ), (P: 0.00 ).

Level of fibrinogen was significantly higher in patients than in controls (patients (6.0 +/-0.7 g/l), controls (2.9 +/- 0.4 g/l) (P: 0.00).

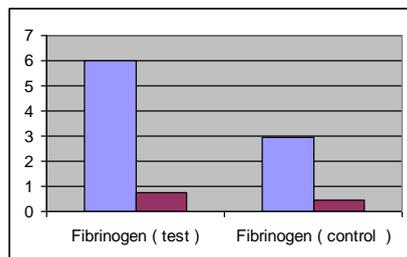
### 1- PT: Seconds



### 2- APTT Seconds



### 3- Fibrinogen: g/l



## **DISCUSSION:**

Systemic lupus erythematosus (SLE) is an autoimmune disease of unknown etiology that involves multiple organ systems. Arterial and venous thromboembolism is a well known clinical entity in SLE, with prevalence 10%. This prevalence may even exceed 50% in high-risk patients (1, 2).

Coagulation disturbance is common manifestation in patient with SLE and these disturbance either hypercoagulability which clinically lead to thrombosis or hypocoagulability which clinically lead to bleeding that may cause severe life threatening (7).

The identification of these risk factor clinically use full to predict the occurrence of thrombosis and bleeding (7).

In this study I was examined the presence of disturbance in coagulation process in patient with SLE with or without a history of bleeding or thrombosis.

I documented increased level of fibrinogen which is a marker of hypercoagulability. Patients (6.0 +/- 0.4 g/l), control (2.9 +/- 0.4 g/l) (P : 0.00).

Also I found prolongation of APTT which more common associated with anti phospholipid antibodies.

Patients (40.8 +/- 5.4 seconds), controls (30 +/- 4.2 % seconds) (P : 0.00).

The PT is not significantly increase in comparison with control.

Patients (12 +/- 1.1 %) seconds. Control (12.1 +/- 1.5 %) seconds. (P: 0.000).

This finding agreement with other previous study that obtained by a group of researcher (Anotetonella et al)

In American College of Rheumatology studied the thrombotic tendency in 57 patient with SLE and also other previous study done by (Nahid et al) in Saudi Arabia, Studied the coagulation abnormalities in SLE patient.

So patient with SLE require good follow up for potential coagulation disturbances to avoid the risk factors of these disturbances complication.

## **CONCLUSIONS**

This study confirm the presence of coagulation disturbance in patient with SLE by Assessing PT, APTT and fibrinogen level which more commonly developing of thrombosis, this hyper coagulability state associated with the presence of APL which is one of major factor responsible for thrombosis in patient with SLE , the risk of developing a thrombotic event in APL positive patients is likely to be enhanced by the presence of certain procoagulant alteration (7).

## **Acknowledgment**

Special thanks to the Staff of Haematology Department, Faculty of Medical Laboratory Sciences, Alneelain University.

## **REFERENCE:**

1. Jeremiah D. Dreisbach, Luke P. Dreisbach, David E. Young and Philip B. Dreisbach Eisenhower Medical Center, Rancho Mirage, CA, USA; Desert Hematology Oncology Medical Group, Inc., 39800 Bob Hope Drive, Rancho Mirage, CA 92270, USA. Acquired factor VIII inhibitor and lupus anticoagulant presenting with prolonged aPTT: a case report. 31 January 2010
2. Laurence, J, Wong, JE, Nachman, R. The cellular hematology of systemic lupus erythematosus. In: Systemic Lupus Erythematosus, 2d ed, Lahita, RG (Ed),
3. Castellino G, Govoni M, Prandini N, et al. Thrombocytosis in systemic lupus erythematosus: A possible clue to autosplenectomy. Qushmaq K, Esdaile J, Devine DV. Thrombosis in

systemic lupus erythematosus: the role of antiphospholipid antibody. *Arthritis Care Res* 1999; 12:212–9. *J Rheumatol* 2007; 34:1497.

4 .Voulgarelis M, Giannouli S, Tasidou A, et al. Bone marrow histological findings in systemic lupus erythematosus with hematologic abnormalities: a clinicopathological study.

5. Vicente Baca, Guadalupe Montiel, Luis Meillo'n, Javier Pizzuto, Teresa Catala'n, Shum, and Beatriz Nieva. -Diagnosis of Lupus Anticoagulant in the Lupus Anticoagulant-Hypoprothrombinemia Syndrome: Report of Two Cases and Review of the Literature Luis .*American Journal of Hematology* 71:200–207 (2002)

6. Amoroso A, Mitterhofer AP, Del Porto F, Garzia P, Ferri GM, Galluzzo S, et al. Antibodies to anionic phospholipids and anti-beta2-GPI: association with thrombosis and thrombocytopenia in systemic lupus erythematosus. *Hum Immunol* 2003; 64:265–73.

7. Antonella Afeltra, Marta Vadacca, Laura Conti, Sara Galluzzo, Anna P. Mitterhofer, Giovanni M. Ferri, Flavia Del Porto, Domenico Caccavo, Giuseppe M. Gandolfo, and Antonio Amoroso. *Thrombosis in Systemic Lupus Erythematosus: Congenital and Acquired Risk Factors*. 2005, American College of Rheumatology

8. *Haematological Manifestations in Systemic Lupus Erythematosus* Nahid Janoudi and Ekhlas Samir Bardisi KFSH&RC Jeddah Saudi Arabia.