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Measurement of the hypercoagulability state in Sudanese patients with acute myelogenous leukemia in Khartoum state

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ABSTRACT

Leukemias are a group of disorders characterized by the accumulation of malignant white cells in the bone marrow and blood. This study aimed to measurement the hypercoagulability state in Sudanese patients with acute myelogenous leukemia in Khartoum state between November 2015 and April 2016. The study included 80 individuals, 40 of them were Acute Myelogenous Leukemia patients and 40 from healthy individual as control (Same age and sex with patients). Results were as follow: the mean of fibrinogen level 282.73mg/dl in comparison to control group 270.40mg/dl, Prothrombin PT 14.05 seconds in comparison to control 12.70 seconds. Activated partial thromboplastin time APTT 34.70 seconds in comparison to control 34.30 s and thromboplastin time TT 13.943 seconds, in comparison to control 13.945 seconds. There were no obvious effects on patients with Acute Myelogenous Leukemia in most of parameters when compared with control group which show the lack of relationship between the patients with acute myelogenous leukemia and coagulability (fibrinogen; Prothrombin; activated partial thromboplastin time and thromboplastin time)

Key words: Acute leukemia fibrinogen level, PT, PTT, TT.

INTRODUCTION

Leukemia is a cancer of blood or bone marrow and is characterized by an abnormal proliferation (production or multiplication) of blood cells usually white blood cells. These immature cells accumulate in the blood and within organs of body. They are not able to carry out the normal function of blood cells. [1]

Acute myeloid leukemia (AML) is a malignant disease characterized by an accumulation of immature myeloid blast cells in the bone marrow and most often in the peripheral blood. AML can also be present in other tissues such as in the skin [2, 3]

The clonal expansion of myeloid precursor cells in AML interfere with normal myelopoiesis and results in deficient function of normal blood cells which in turn leads to AML associated symptoms , ex: fatigue, bleeding and severe infections, some which are lethal Immunophenotypic analysis by flow cytometry is a useful tool in AML in order to e.g. detect “myeloid” or “lymphoid” cell markers, making it possible to distinguish between minimally differentiated AML and acute lymphoblastic leukemia (ALL)[4,5]

MATERIALS AND METHODS

Study area and population:
Blood samples were conducted at Radiation and Isotopes center Khartoum (RICK) the largest hospital in Sudan and infective patients from all the century. During the period from November 2015 to April 2016 were excluded any individual don't diagnosis with AML. Questionnaire was used to obtain information about age, Gender, FAB Classification, Blast in peripheral, Blast in B.M, Splenomegaly and Treatment

Sample Collection:
One point eight ml of venous blood were collected from case and control subjects by using sterile disposable syringes and poured into tri-sodium citrate containers, immediately centrifuged at 2500g for 15 minutes and plasma separated using a plastic pipette and used to measure fibrinogen, PT, APTT and TT.

Statistical Analysis
All data included in the questionnaire was coded and listed in the table sheet and then computerized (SPSS statistical package for social science program Version 20 Years 2016) software was used for data entry and analysis included description statistic and standard deviation

RESULTS

The study included 80 individuals, 40 of them were Acute Myelogenous Leukemia patients and 40 from apparently healthy individual non leukemic as control group (Same age and sex with patients).All participate fall in age ranged of (1-59 years)

Table 1 :Mean of PT & PTT and TT (Case \ control)

sample	mean \ PT	mean \ PTT	TT
case	14.05	34.7	13.9
control	12.7	34.3	13.9
p.value	0.0	0.3	0.9

The result showed insignificant correlation result when compare case group with Control group for PT, PTT and TT (p.value=0.00, 0.3, 0.9)

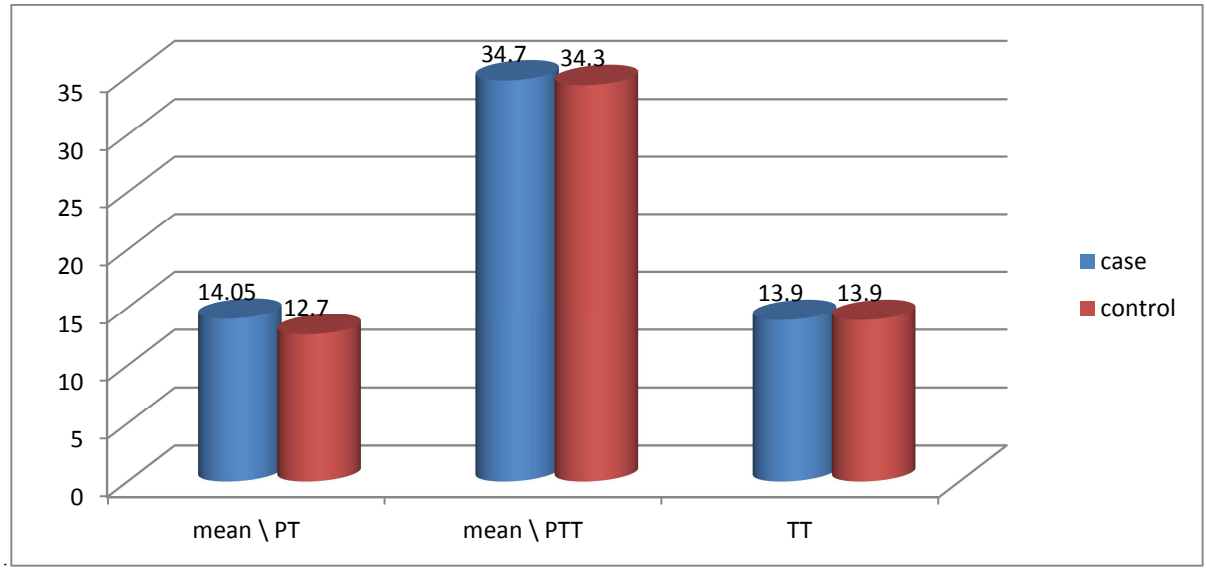

Figure 1 Mean of PT & PTT and TT (Case \ control)

Table 2:Mean of PT& PTT and TTand frequency of case in correlate to age ,gender, splenomegaly ,duration, Treatment

Classification		mean \ PT	p.value	mean \ PTT	p.value	Mean \ TT	p.value
Treatment	Daunorubicin	13.97	0.3	34.46	0.04	13.837	0.5
	ATRA(treinoin	14.6		36.4		14.088	
Gender	male	13.13	0.05	34.8	o.1	14.104	0.4
	female	13.71		34.09		13.775	
Duration	1-5 month	13.96	0.4	34.48	0.3	13.267	0.5
	6 month – 1 year	14.33		35.08		13.956	
	> 1 year	13.67		35		13	
Splenomegaly	no	13.35	0.2	34.51	0.8	13.877	0.5
	yes	15		34		14.4	
Age	1-10 year	13.75	0.3	35.25	0.3	14.2	0.5
	11-20 year	12.9	0.2	34.2	0.2	14.01	0.6
	21-30 year	12.88	0	35.08	0.1	13.85	0.3
	31-40 year	13.75	0	34.14	0.1	14.164	0.2
	41-50 year	12.5	0.2	31.5	0.05	13	0.3
	51-60 year	14.13	0.1	34.25	0.06	14.25	0.1
	> 60 year	13.5	0.5	35.5	0.01	12.4	0.4

The result showed insignificant normal PT when divided case group into 7 interval group with p.value (1-10 (p.value 0.3)), (11-20 (p.value 0.2)), (21-30 (31-40 (p.value 0.00)).(41-50 (p.value 0.2)), (51-60(p.value 0.1)), (more than 60 (p.value 0.5))

And when correlated to treatment, duration, splenomegaly (if present or not) with p.value (0.3, 0.4, 0.2, respectively) and significant normal PT in correlate to gender occur more in male than female with p.value (0.05).

The result showed insignificant normal PTT when divided case group into 7 interval group with P.value (1-10 (p.value 0.3)), (11-20 (p.value 0.2)), (21-30 (p.value 0.1)), (31-40 (p.value 0.1)), (51-60 (p.value 0.06)), and significant normal PTT with p.value (41-50(p.value 0.05)), (more than 60 (p.value 0.01)).

And when correlated to gender, duration of acute myelogenus leukemia, splenomegaly (if present or not) with p.value (0.1, 0.3, 0.8, respectively) and significant normal PTT in correlate to treatment with p.value (0.04)

The result showed insignificant normal TT when divided case group into 7 (1-10, 11-20, 21-30, 31-40, 41-50, and more than 50years), and the result of TT was insignificant normal TT with p.value (0.5, 0.6, 0.3, 0.2, 0.3, 0.1, and 0.4, respectively)

This results represented insignificant mean value of TT in correlated to gender, duration (classified into three group 1-5month (25pt), 6month-1year (12), and more than 1year (3)), splenomegaly (present or not), and treatment that used to patient (Daunorubicinoror ATRA (treinoin) with p.value (0.5, 0.4, 0.5, and 0.5, respectively)

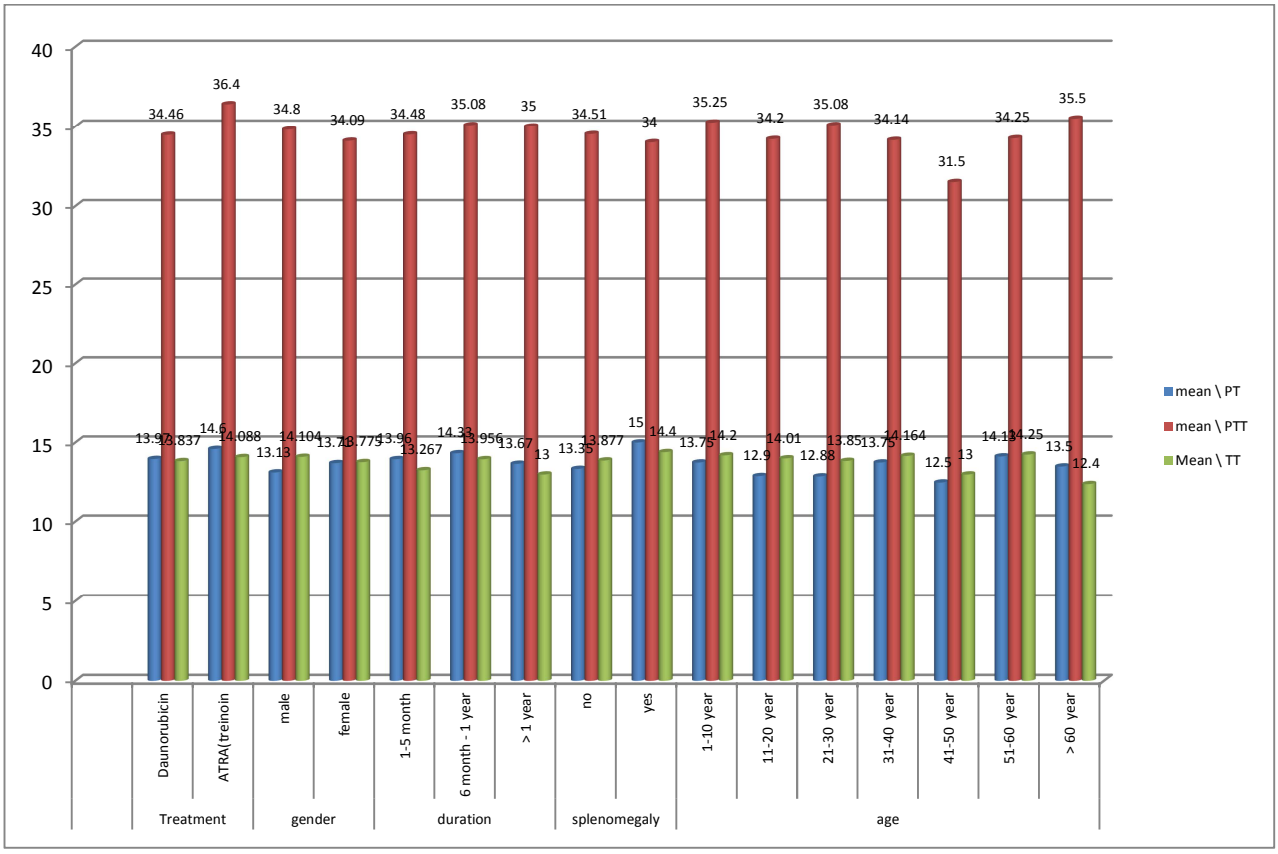

Figure 2 :Mean of PT & PTT and TT and frequency of case in correlate to age ,gender, splenomegaly ,duration, Treatment

Table 3: Mean of fibrinogen (case \ control)

sample	Mean \ fibriogen	p.value
case	282.73	0.2
control	270.4	

The result showed insignificant correlation result when compare case group with Control group for fibrinogen (p.value=0.2)

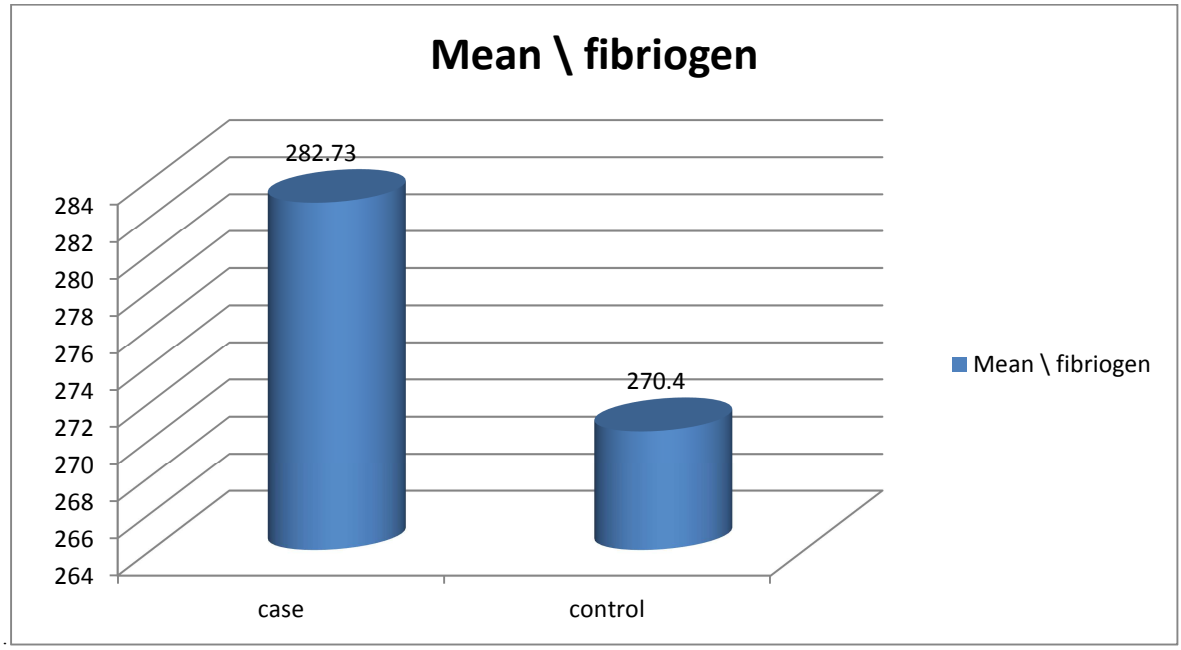

Figure 3 :Mean /fibrinogen (case /control)

Table 4:Mean of fibrinogen and frequency of case in correlate to age ,gender, splenomegaly ,duration, Treatment

Classification		Mean \ fibriogen	p.value
Gender	male	265.28	0.00
	female	291.82	
Splenomegaly	no	276.51	0.00
	yes	281	
Duration	1-5 month	290.08	0.00
	6 month - 1 year	263	
	> 1 year	300.33	
Treatment	Daunorubicin	282.37	0.00
	ATRA(treinoin	285.2	
Age	1-10 year	309.25	0.3
	11-20 year	258.7	
	21-30 year	276.92	
	31-40 year	276.61	
	41-50 year	312	
	51-60 year	272.5	
	> 60 year	276.5	

The result showed insignificant value of fibrinogen when correlated to age group (1-10, 11-20, 21-30, 41-50, 51-60, and more than 60) with p.value (0.3), and highest frequency of age group in age group 31-40(35%)

The result showed insignificant normal PT when correlated to treatment, duration of acute myelogenus leukemia, splenomegaly (if present or not) with p.value (0.3, 0.4, 0.2, respectively) and significant normal PT in correlate to gender occur more in male than female with p.value (0.05).

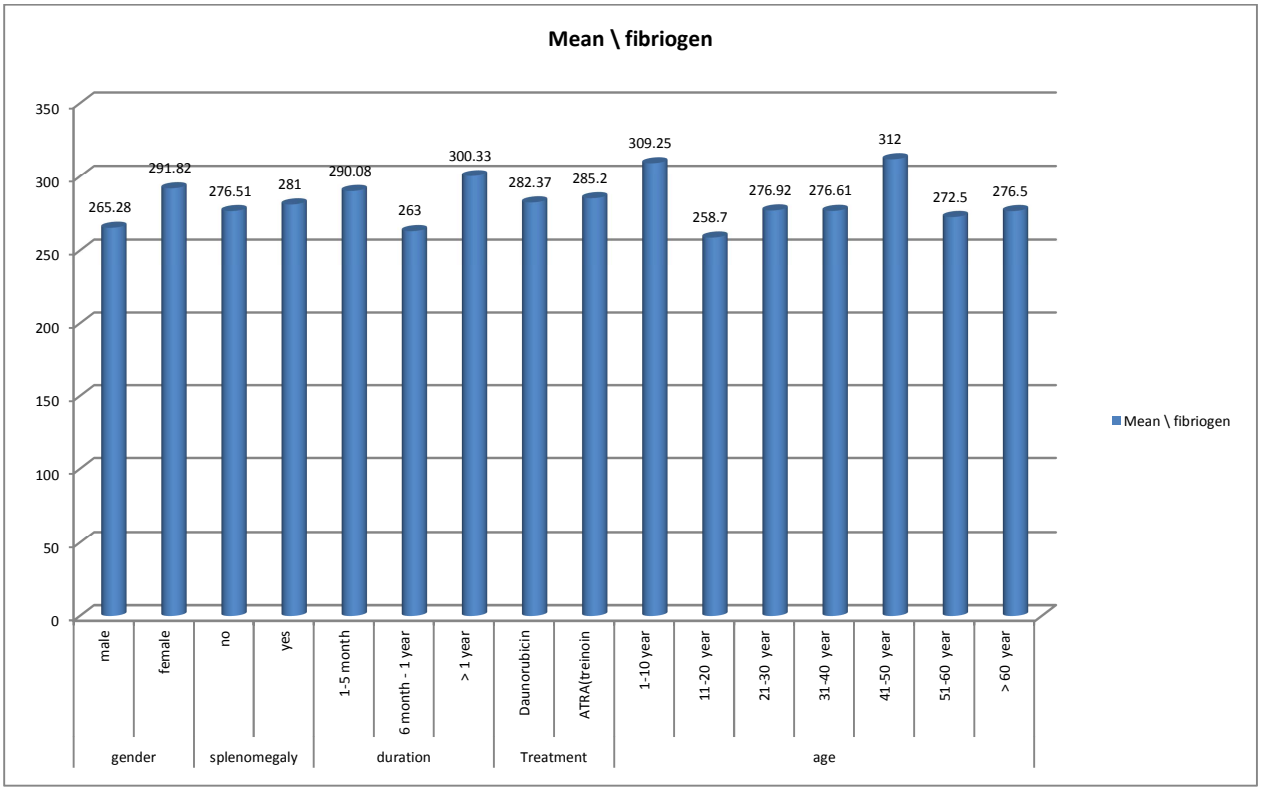

Figure 4:Mean of fibrinogen and frequency of case in correlate to age ,gender, splenomegaly ,duration, Treatment

DISCUSSION

Change in coagulation profile occurs in patients with AML, understanding of these change is necessary for management of bleeding disorder.

The results agree with Vijaya B. Reddy, et al., [(6)]The result of PT and APTT were in significant and The results of fibrinogen wasmean (non significant) b/w 3.1 ±0.9 g/l

The results of fibrinogen was not Agree with Hee-Jeong Lee, et al.[(7)]The result showed significant value of fibrinogen with P.value (0.00). PT results were not agreed and PTT agreed with Erica Robinson BS, et al. [(8)].The result of PT was prolonged and PTT was normal

The results agreed with H Kim, et al who said[(9)]Plasma fibrinogen was showed insignificant (<250 vs 250 mg/dl).

The results also disagreed with Maysaa A. Abdullah, eyal[(10)]TT result was significant prolonged with p.value (0.001).

CONCLUSION

There were no obvious effects on patients with acute myelogenus leukemia in most of parameters when compared with control group which show the lack of relationship between the patients with acute myelogenus leukemia and coagulability (fibrinogen; Prothrombin; activated partial thrmboplastin time and thromboplastin time)

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