

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قال الله تعالى

الْمَ (1) ذَلِكَ الْكِتَابُ لَا رَبَّ لَهُ فِيهِ هُدًى  
لِلْمُتَّقِينَ (2) الَّذِينَ يُؤْمِنُونَ بِالْغَيْبِ  
وَيُقِيمُونَ الصَّلَاةَ وَمَمَّا رَزَقْنَاهُمْ يُنْفِقُونَ  
(3) وَالَّذِينَ يُؤْمِنُونَ بِمَا أُنْزِلَ إِلَيْكَ وَمَا  
(أُنْزِلَ مِنْ قَبْلِكَ وَبِالْآخِرَةِ هُمْ يُوْقِنُونَ (4)

صدق الله العظيم

سورة البقرة الآيات 4-1

## **Dedication**

I dedicate this work to:-

My mother who constantly beg Allah to give me strength to goon studying without hindrance .

Half of apple my husband who encouraged me to go on study .

My friends stand behind me at time of needs

## **Acknowledgement**

I would like to express my gratefulness and sincere thank to my supervisor Dr. Mohieldeen Abaas Abdalla without his strict continuous guidance this work could have not been a reality . I ask his forgiveness if I cause for him any trouble .

Also I thank all those who I am gave help to me during the preparation of this research specially my friends .

## **Abstract**

This study was a cross sectional study ;conducted in AL Rakha hospital , from 5/5/2012 to 5/6/2012 to estimate PT, APTT, TT, Fibrinogen level , D-dimer among patients of diabetes mellitus typeII .

4.5ml venous blood collected from fifty patients of diabetes mellitus typeII in trisodium citrate anticoagulant , the result compared with thirty normal healthy non diabetic individuals and collected data were analyzed by Statistical package of social science (SPSS) , the research revealed the following results:

There was insignificant difference of PT/second in diabetic patient typeII when compared with control group (P value > 0.05),also there was insignificance prolongation of APTT in diabetic typeII when compare with control group (p value > 0.05).

Significant increased in TT/second , fibrinogen level and D-dimer in the diabetes patients when compared with control group (P.value.00) .

Also there were insignificance difference of PT/second, APTT/second,TT Fibrinogen level and D-dimer in male ,when compared with female the study reveal the (P value> 0.05).

Also there were insignificance difference of PT/second, APTT/second,TT ,Fibrinogen and D-dimer in duration of disease with (P value>0.05) ).

Also there were insignificance difference of PT/second, APTT/second,TT Fibrinogen and D-dimer age group (P value >0.05),

The results obtained indicated that measurement of thrombin time (TT),fibrinogen, and D-dimer were necessary when evaluating patient with diabetes mellitus typeII there was clinical evidence of hemostatic abnormality.

## ملخص البحث

هذه دراسة وصفية قطاعية أجريت في مستشفى الرخا بولاية الخرطوم في الفترة من 2012/5/6 الي 2012. هدفت الدراسة لقياس زمن البروثرومبيين زمن الثرومبوبلاستين الجزئي المنشط ، زمن الثرومبيين، الفبرنوجين و ديرايمر للمصابين بمرض السكر من النوع الثاني المتريدين على مستشفى الرخاء .

أخذت 4.5 ملليلتر من الدم الوريدي من 50 مريض ووضعت في حاوية تحتوي على مانع تجلط ثلاثي سترات الصوديوم واستخلص المصل فقير الصفائح الدموية لقياس زمن البروثرومبيين زمن الثرومبوبلاستين الجزئي المنشط ، زمن الثرومبيين، الفبرنوجين و ديرايمر وقورنت النتائج مع عينة من 30 من الاصحاء كمجموعة ضبط. وتم تحليل النتائج بواسطة برنامج الحزم الاحصائية للعلوم الاجتماعية اصدارة 11.5 ، تم حساب المتوسط وكانت النتائج كالتالي :

ووجدت فروقات ذات دلالات غير معنوية بين المصابين بمرض السكر من النوع الثاني في متوسط زمن البروثرورومبيين ، متوسط زمن الثرومبوبلاستين الجزئي المنشط ، بالنسبة للمرضى ، عندما قورنت مع المتوسطات في مجموعة الضبط (القيمة المعنوية اكبر من 005)،

ووجدت فروقات ذات دلالات معنوية بين المصابين بمرض السكر من النوع الثاني في متوسط الفبرنوجين و ديرايمر، زمن الثرومبيين بالنسبة للمرضى عندما قورنت المتوسطات مع مجموعة الضبط (القيمة المعنوية اقل من 005) .

ايضا اوضحة الدراسة انه ليس للنوع ولا العمر اي تأثير على متغيرات الدراسة بقيمه معنويه ( اكبر من 0.05) ولا فترة المرض تأثير على المتغيرات بقيمه معنويه ( اكبر من 0.05) . وأشارت المحصلة علي ان قياس والفبرنوجين و ديرايمر ، زمن الثرومبيين ضرورية عند المصابين بمرض السكر من النوع الثاني

## List of Contents

NO	Contents	Page
1.	الاية	I

2.	Dedication	II
3.	Acknowledgment	III
4.	Abstract	IV
5.	Abstract(Arabic)	V
6.	List of Contents	VI
7.	List of tables	X
8.	List of figures	XI
9.	Abbreviations	XII
	Chapter One Introduction & Literature Review	
1:1	Introduction	1
1:2	Literature Review	3
1:2:1	Coagulation Mechanism	3
1:2:1:1	Platelet Activation	3
1:2:1:2	The Coagulation cascade	4
1:2:1:1	The Coagulation cascade of secondary hemostasis	4
2:1:3	Tissue factor pathway (extrinsic)	5
1:2:1:4	Contact activation pathway(intrinsic pathway)	6
1:2:1:5	Final Common pathway	6
1.2.1.6	Cofactors	7
1.2.1.7	Regulators	7
1.2.1.8	Fibrinolysis	9
1.2.1.9	Role in immune system	9
1.2.1.10	Platelet disorders	9
1.2.1.11	Disease and clinical significance of thrombosis	10
1.2.1.12	Testing of coagulation	11

1.2.2	Diabetes Mellitus	12
1.2.2.1	Classification	13
1.2.2.1.1	type 1 diabetes	13
1.2.2.1.2	Type II diabetes	13
1.2.2.1.3	Gestational Diabetes	14
1.2.2.2:	Cause of diabetes	16
1.2.2.3	Signs and symptoms of diabetes	16
1.2.2.4	pathophysiology	16
1.2.2.5	Diagnosis	18
1.2.2.6	Complication	19
1.2.2.7	Management	20
1.2.2.8	Life style modification	20
1.2.2.9	Support	21
01.3	The role of coagulation factors in diabetes patient	21
1.4	Coagulation Profile in Diabetes and its Association With Diabetic Micro vascular complications	21
1.5	Reduced Fibrinogen Survival in diabetes mellitus	22
1.6	Increased thrombotic tendency in the vascular complication of diabetes	22
1.7	Coagulation factor V111activity in diabetic patients.	22
1.8	Plasminogen Activation in Diabetes Mellitus	23
1.3	Rationale	24
1.4	Objectives	25
1.4.1	General objective	25
1.4.2	Specific objectives	25

	<b>Chapter Two</b>  <b>Materials and methods</b>	
2.1	Study design	26
2.2	Study population	26
2.3	Sample size	26
2.4	Inclusion criteria	26
2.5	Exclusion criteria	26
2.6	Sample collection	26
2.7	Ethical consideration	26
2.8	Data collection	27
2.9	Methodology	27
2.9.1	Coagulometer	27
2.9.2	Prothrombin Time	27
2.9.3	Activated Partial Thromboplastin Time (APTT)	28
2.9.4	The Thrombin Time Assay	29
2.9.5	Fibrinogen Assays	30
2.9.6	D-Dimer test	30
2.10	Data analysis	31
3	<b>Chapter Three</b>  <b>Results</b>	32
4	<b>Chapter Four</b>  <b>Discussion, Conclusion and Recommendations</b>	36
4.1	Discussion	36
4.2	Conclusion	39

4.3	Recommendations	40
	References	41
	Appendices	45

## **List of Tables**

NO	Title	Page
Table 1.1	Comparison between type 1 and typeII	15
Table 1.2	2006 WHO Diabetes Criteria (ADA ,2010)	18
Table.3.1	Comparison between the diabetic patient type 2 and control in the mean values of PT, APTT, TT, Fibrinogen, and D-dimer	32
Table .3.2:	Comparison between the mean values of PT, APTT ,TT Fibrinogen, and D-dimer according to gender	33
Table .3.3	Comparison between the mean values of PT,APTT TT, Fibrinogen and D-dimer according to age group:	34
Table. 3.4:	Comparison between the mean values of PT, ApTT , TT Fibrinogen ,and D-dimer according to duration:	35

## **List of Figures**

NO	Title	Page
1:2:1:2	The Coagulation cascade	4
Figure 3.1	Frequency of case and control	46
Figure 3.2	Frequency of male and female	47
Figure 3.3	Frequency of age group /years	48
Figure 3.4	Frequency of duration group /years	59

## **Abbreviations**

APC: Activated protein C

APTT: Activated partial thromboplastin time.

CNS: Central Nerves System.

DF: Dilution Factor.

DKA : Diabetic Ketoacidosis .

DM: Diabetes Mellitus .

DU. disease: Duration of disease .

IDDM: Insulin Dependant Diabetes Mellitus .

LADA: Latent Autoimmune Diabetes of Adults.

NIDDM: Non insulin Dependant Diabetes Mellitus

PPP:Platelet Poor Plasma.

PT: Prothrombin Time.

SD: Standard Deviation.

SPSS: Statistical Package of Social Science.

TFPI: Tissue Factor Path Way Inhibitor.

VWF : von Willebrand Factor