

Evaluation of D-dimer level among adult patients in Al-Quwayyah Government Hospital, Saudi Arabia

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ABSTRACT

Our Objective was to Evaluate the D-dimer level among adult patients in Al-Quwayyah Government Hospital, Saudi Arabia. A prospective study was conducted during four months period in 2012. The inclusion criteria were patients eighteen years of age and above who have surgical procedure. Information was obtained by the Laboratory Department of Al-Quwayyah Government Hospital. A Total of 46 patients were done a D-dimer test in a hospital. The patient's constituted 32 males and 14 females and the average age was 60 years. D-dimer test, findings indicated that 69.5% was found abnormal level of D-dimer (elevated) and 30.5% was normal D-dimer level. The average age of abnormal D-dimer group is 59 years old (Male and female). No difference in the result of abnormality of D-dimer. Levels were found between male and female, but there were found a significantly relationship that associated with increasing of the age of patients. In this study, the proportion of the high level of D-dimer in this group was 69.5%. The increase in the client age plays a vital role in the increase of D-dimer level. Advices and recommendations are should be pay attention to help those patients suffering of elevated D-dimer level.

INTRODUCTION

D-dimer is define as "a fibrin degradation product, a small protein fragment present in the blood after a blood clot is degraded by, fibrinolysis" (Sanchez et al., 2008). It is named by D-dimer because it consists of two cross linked D fragments fibrinogen protein (Adam et al., 2009). In the 1970s the D-dimer was discovered, and found its diagnostic application after two centuries D-dimer test is a blood test that is used to rule out active thromboses of blood (Pelareti et al., 2006). If the D-dimer result is normal (negative) that almost rules out the possibility that the client has an active thromboblism. When the d-Dimer test result positive (elevated) (Rathbun et al., 2008; Pinheiro et al., 2012; Wells et al., 2003). That does not mean the client has a thromboblis, rather an elevated D-dimer result means that further testing might be required to discover the presence of blood clotting.

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The D-dimer level in the blood seem is a significant indicator of either if clot gets stuck in the lungs, deep vein thrombosis (DVT) or pulmonary embolism (Chang et al., 2010; Ay et al., 2012; Tenna et al., 2012).

Moreover, checking D-dimer normal range is a vital in discovering a primarer diagnosis of disseminated of intra-vascular coagulation. The normal range of D-dimer is about 0.5 mg/l of blood or 500 ng/ml of blood (Retrieved January, 2009; Kline et al., 2005).

When client is showing an elevated D-dimer level so, then the D dimer may make slight difference and anticoagulant therapy should be initiated for the client. Furthermore, testing to check pulmonary embolism should be done If patient has a low range or if there is a low pretest possibility, then a negative. This is because the degree to which the D dimer reduces the probability of thrombotic disease is dependent on the test properties of the specific test that is being used in that clinical setting. Additionally, if the result of the D dimer is higher than normal range the further testing is needed to validate the existence of clotting in blood (Nagy et al., 2012; Schrecengost et al., 2012).

MATERIAL AND METHODS

A prospective study was conducted during four months period in 2012. The inclusion criteria were patients eighteen years of age and above who have surgical procedure. Information was obtained by the laboratory of Al-Quwayyah General Hospital.

A total of 46 patients were done a D-dimer test in a hospital. The patient's constituted 32 males and 14 females and the average age was 60years. D-dimer test. We were titrated the plasma sample to determine the blood clot's strength, and if it's hard, moderate or mild.

So we do the following steps:

1. We were brought three test tubes:

* In tube 1, we mixed 100 micro ml of plasma with 1 ml of puffer.

* In tube 2, we mixed 0.5 of puffer with 100 micro from tube one.

* In tube 3 , we mixed 0.5 ml of puffer with 100 micro of the mixture of tube2, then we get rid of 100 micro of it.

2. We were brought a glass slide and we putted one drop (50 micro) of tube 1 in it's circle. On another slide we put one drop of tube2. On a third slide we are put one drop of tube 3.

3. We were putted one drop (50 micro) of reagent (which is Antibodies-D-dimer) on each slide and we mixed them.

4. We were waited for three minutes.

5. We were observed the results.

6. If there any thrombosis in the sample that is mean there's a d-dimer. Then we determine the strength of the Thrombosis.

7. If there is no any thrombosis that is mean there is no d-dimer.

8. After that we documented the results.

RESULT AND DISCUSSION

A total of 46 patients were done a D-dimer test in a hospital. The patient's constituted 32 males and 14 females and the average age was 60years. D-dimer test, the findings indicated that 69.5% was found abnormal level of D-dimer (elevated) and 30.5% was normal D-dimer level. The average age of Abnormal D-dimer group was 59 years old (Male and female). No difference in the result of abnormality of D-dimer .levels were found between male and female, but there were found a significantly relationship that associated with increasing of the age of patients.

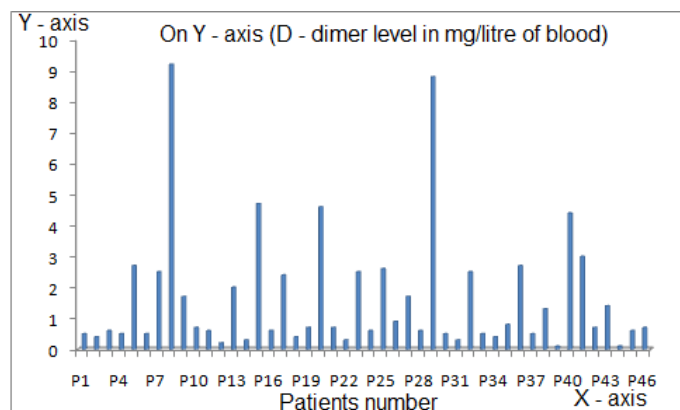


Fig 1: D-dimer result of male & female (P1 to P32 for male & P33 to P46 for female).

Table. 1: This table illustrated the age, gender of members and the results of the test of study.

Patients number	Sex	Age	Result
P1	M	78	0.5
P2	M	22	0.4
P3	M	61	0.6
P4	M	70	0.5
P5	M	67	2.7
P6	M	39	0.5
P7	M	80	2.5
P8	M	62	9.2
P9	M	48	1.7
P10	M	54	0.7
P11	M	77	0.6
P12	M	28	0.2
P13	M	73	2.0
P14	M	23	0.3
P15	M	70	4.7
P16	M	78	0.6
P17	M	66	2.4
P18	M	18	0.4
P19	M	56	0.7
P20	M	70	4.6
P21	M	54	0.7
P22	M	20	0.3
P23	M	85	2.5
P24	M	77	0.6
P25	M	67	2.6
P26	M	20	0.9
P27	M	48	1.7
P28	M	79	0.6
P29	M	61	8.8
P30	M	22	0.5
P31	M	28	0.3
P32	M	80	2.5
P33	F	79	0.5
P34	F	18	0.4
P35	F	56	0.8
P36	F	35	2.7
P37	F	68	0.5
P38	F	85	1.3
P39	F	20	0.1
P40	F	70	4.4
P41	F	48	3.0
P42	F	78	0.7
P43	F	85	1.4
P44	F	22	0.1
P45	F	62	0.6
P46	F	77	0.7

In the analyzing of this patient's results of D-dimer test, the findings indicated that 69.5% was founded abnormal level of D-dimer (elevated) and 30.5% was normal D-dimer level..The average age of Abnormal D-dimer level group were 59 years old (Male and female). Table 2 & 3.

Table. 2:

Patients	D-dimer level (Normal)	D-dimer level (Abnormal)	Total
Male	10 (31.25%)	22 (68.75%)	32
Female	5 (35.71%)	9 (64.28%)	14
Total	15 (32.6%)	31 (67.39%)	46 (100%)

Table. 3:

	Male	Female	Female & Male
Number of Points	32	14	46
Mean	1.80	1.22	1.63
Standard Deviation	2.23	1.26	1.99
Standard Error of Deviation	0.395	0.338	0.186
Median	1.404	0.985	1.25

No difference in the result of abnormality of D-dimer levels were found between male and female, but there were found a significantly relationship that associated with increasing of the age of patients. As shown in the table above we founded the percentage of male that has elevated level of D-dimer is 68.75% whereas the female has 64.29%. When reviewing in the patient's history that who have a abnormal D-dimer level we founded they had a recent surgical procedure or lake of activity daily living. D-dimer tests are used with other laboratory tests to help the diagnose of diseases that is causes hypercoagulability. One of the most common of these diseases is DVT (Deep Vein Thrombosis) that involves clot forming in the deep veins of the body which frequently accrued in the legs. These clots may become enlarged and leads to abstraction of blood in the legs vein. The abstraction could cause swelling, pain, and tissue damage. The clot might be broken off and goes to pulmonary artery and the heart which leading to a worse condition. This condition known as a blood clot in the lungs or pulmonary embolism (PE). It is well known that the clot mostly is occurred in the legs. However, the clot forming can be happened in another part in the body. For example, the myocardial infarction (MI) is occurred due to clots in coronary arteries and also could be formed in valves of the heart.

Moreover, the clot forming may be happened in another organ of body. For example, the brain stroke and clot in kidney. The D-dimer can clarify the clots in other sites of body and the diagnose of the disseminated Intravascular Coagulation (DIC). The monitoring of d-dimer level in the body is a significantly important to determine the effectiveness of treatment of DIC. For instant, a positive D-dimer shows the existence of an abnormality elevated level of fibrin degradation contents in human body. These indicate that there is a significant thrombus and broken off in human body but cannot detect cause or the location of thrombus. The elevated level of D-dimer may occur due to recent surgery, infection, and trauma, but also can be cause of DIC or VTE. In addition, heart, liver, and some cancer diseases may be associated with elevated level of D-dimer. As we know the increase of D-dimer level in the blood is highly critical and might be lead to the previously mentioned diseases and finally death. Clients who have a high level D-dimer in this study group, we find that the most important reasons that cause an elevated D-dimer lever are include but not limited to (hypertension, diabetes and obesity. Hypertension and an increase in age (age particularly is factor that has been observed in the study group). Moreover, sitting for a long period or lack of movement are factor cause of increase the level of D-dimer. Lake of movement is a wrong common habit that is spread in community of Saudi Arabia. Clients who have a high level of D-dimer should be placed under a high medical supervision and care until the recurred. In addition, anticoagulant medication should be give, such as heparin, and Warfarin etc. Recommendations and advices would be given such as doing exercises, Quit smoking, and maintaining an ideal weight. Healthy food must be recommended particularly for diabetic client. Patients who are

traveling for a long distance by airplanes or cars could be advised to do an exercise for each short period of time. The use of leg sucks (leg cheap bandage sucks) is very useful for DVT cases. Finally, patient must be follow the doctors advise till become a stable or cured.

CONCLUSIONS

In this study, the proportion of the high level of D-dimer in this group was 59%. The increase in the client age plays a vital role in the increase of D-dimer level. Advices and recommendations are should be pay attention to help those patients suffering of elevated D-dimer level.

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