STUDY THE EFFECT OF THE ANTIHYPERTENSIVE DRUG (TENORMIN) ON SOME BLOOD CHARACTERISTICS AND ON THE ACTIVITY OF ISOLATED LEUKOCYTES MEASURED BY CHEMILUMINESCENCE.

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(Received 27 June 2006,Accepted 16 August 25 October 2006)

Key words: Atenolol,Erythrocytic count,Hypertension.

ABSTRACT

tenormin (atenolol) orally daily for more than three years. The other This study had been done on thirty blood samples drown from thirty men between 40-60 years of age half of them suffering from hypertension and taking lOOmg fifteen men were healthy and did not taking any drug and regarded as control. Those blood samples were subjected to study some hematological parameters such as hemoglobin percentage and total erythrocytic and leukocytic counts. Also isolation of leukocytes was done from both hypertensive patient and control and study their activity by chemiluminescence method.

Result showed that prolonged treatment by tenormin of 100 mg orally daily resulted in significant decrease ($P < 0.01$)in total erythrocytic and leucocytic counts as well as the same significant decrease in hemoglobin percentage as compared with controls , it also resulted in significant inhibition of activity of isolated leukocytes as measured by chemiluminescence technique which resulted from their weak reaction with the luminescence material (lucigenin)mixed with it in the measuring chemiluminescence apparatus which is an indication of reduced immunological ability of those leukocytes in addition to their decreased number.

INTRODUCTION

Hypertension is regarded as one of the common diseases nowadays. It affects people of different ages but percentages of its prevailency is increased over 40 years of age . There are several reasons leads to hypertension such as nutritional, genetical, physiological and pathological there are many kinds of antihypertensive preperations used to treat such case ;

and each of these chemical preparations has its benefits and ways in reducing blood pressure such as beta blockers and so on .And each of these chemical preparations has its side effects and negative symptoms on somebody organs or physiology and components especially they must be taken for long periods and in different doses which may be high sometimes in some patients and as we near from hypertensive people who acostomed to take antihypertensive drugs including atenolol that those drugs has several side effects and because there is no a lot of documented scientific researches , we decided to do this study to know the effect of this wide spread drug (tenormin) on some hematological parameters such as hemoglobin percentage , total erythrocytic and leukocytic counts and on the activity of isolated leukocytes invitro using chemiluminescence technique which is used for the first time in this respect after their isolation and kept in Hanks solution .

MATERIALS AND METHODS

Thirty blood sample were collected by drawing 5 ml for each sample from arm vein by means of sterile disposable syringes .The blood was kept in test tubes containing heparin as anticoagulant . Fifteen blood samples were taken from hypertensive male patients between 40-60 years of age taking the antihypertensive drug "tenormin" of 100mg tablet daily for more than 3 years.

The other fifteen blood samples were collected from healthy men of the same age and did not taking any treatment and regarded as control for comparison. Those blood samples of hypertensive were collected from patient admitted to educational hospital of Basrah. Blood samples were brought to the physiology laboratory of college of veterinary medicine where wanted analysis and measurements were done like hemoglobin measurement by using (Sahli hemoglobinometer, resistance, L.W Germany) by using acid hematin method according to (coles, 1986) and total erythrocytic and leukoytic counts by using Hemocytometer (Improved Neubauer , Brigiht line , Telfe , west Germany)according to (Coles, 1986). Also isolation of leukocytes by means of

washing by centrifugation according to the method described by (Bauer,1980) which is summerized as follows:-

1. 4 ml of blood collected in 1 ml heparin anticoagulant.
2. Into the same syringe 6% dextran was added (0.5 ml / ml blood).
3. Placed syring on its plunger and allowed erythrocytes to settle for 60 minutes at room

Temperature.

4. Supernatant white -cell-rich plasma was added into 50 ml plastic conical centrifuge tubes (15 ml / tube).
5. Differential count on sample of white cell rich plasma was done to determine percent distribution of bonds neutrophils , monocytes and eosinophil.
6. 35 ml of 0.87% ammonium chloride was added to each centrifuge tube, invert once and centrifuge rapidly at 3000 r.p.m for 10 minutes . Ammonium chloride lysis stray red blood cells.
7. Suspend cells button in ice cold saline. Pooled and washed once in saline by centrifuging at 3000 r.p.m for 10 minutes . Cells may be kept in cold saline for several hours .
8. Suspend final cell button in Hanks solution to obtain a leukocytes concentration .
9. Perform total leukocytic count.

Hanks solution keeps the activity of isolated leukocytes for about one month, Then the activity of these cells was measured by chemiluminescence system. health physics laboratory in physics department -college of education, university of Basrah , Its formation and function is summarized as follows:- The system is formed from electronic tube called photomultiplier . The solution of leukocytes was putting in a special small beaker then a chemical flurecent material such as lucigenin was added with the leukocytic solution , this flurecent material will react with hydrogen peroxide produced by the leukocytes according to their activity so chemical luminescence will occur which sensitized by the photomultiplier tube and transmits these photons after multiplying then to photon recorder when it is recorded on digital screen in a fixed time , the reading is increased when leukocyte activity is increased when chemiluminescence occurs after the reaction and the chemiluminescence decreased when leukocytic activity decreased if the chemiluminescence decreased in the solution.

Chemiluminescence was recorded for all samples of patients and healthy men as well.

Statistical analysis:- means were calculated of all blood parameters of both treatment and control group and comparison between them was done by using (t) test (student t test) according to (steel and Tome, 1961)

RESULTS AND DISCUSSION

Tables (1) and (2) showe the values and means of total leukocytic numbers and their chemiluminescence values for control and treated groups seperately, that means were

4327.667 and 3810.667 for control and treated groups respectively. These results were summarized in table (3) which indicates the high significant difference between the two groups. The mean total leukocytic number of" tinormin" treated group is significantly decreased (P<0.01) than control group. This result corresponded with that found by each ofHasuda *et al* (1989) ; Iwanari *et al*, (1989), Du-preez and Lockett (1991) and sakuk *et al*,(1990). But this result comes on the contrary of that recorded by kennedy (2000) who mentioned that treatment by tinormin leads to an increase in total leukocytes and did not affect hemoglobin ; This difference in result may be due to difference in dose of the drug and period of treatment and may also be due to differences in patients age and sex .So according to this result we found sever decrease of leukocytic ability to give chemiluminescence compard with high chemiluminescence for control group and this is good indication about decreased activity of leukocytes of treated group.

Table(4) shows the hemoglobin percentage ; total erythrocytes and leukocytes counts of both control and treated groups, also their means are summarized in table (5) which clearly indicate the high significant difference (p<0.01) of the three hematological parameters between control and treated groups,when tenormin treatment caused significant decrease in values recorded .These results are agreed with that found by Gallangher and popovic (1977), they found that tinormin leads to lysis of erthrocytes due to abnormal changes of cellular enzymes ; in addition it also reduce erthrocytic production from the bone marrow . Also results of decreased hemoglobin percentage by tenormin in this study coincide with shaud *et al*, (1995) who found significant decrease in hemoglobin concentration of patients treated with enalapril antihypertensive drug compared with healthy persons. But they found that this type (enalapril) of antihypertensives leads to increase total leukocytic and erythrocytic numbers contrary to results found in this study that tenormin cause decrease in both total leukocytic and erythrocytic numbers . But our results are completely agreed with the results of cherfan *et al*, (1988) when they found that tenormin caused significant decrease in all hematological parameters compared with the same parameters of healthy persons.

Table (2) ;- Total leukocytic counts and their chemiluminescence of tinormin treated group.

Sample number	Total leukocytic count	Chemiluminescence value In 100 seconds	Chemiluminescence value in one second
3	2550	175485.5	1754.855
4	3000	63417	634.1
6	2300	41870.6	418.706
7	3450	280315	2803.15
9	2950	70.66	0.7066
10	3700	41.4	0.414
11	4950	176420.8	17642.08
12	3800	42	0.42
13	6000	10.8	0.108
14	3750	34.6	0.346
15	4200	28	0.28
16	5150	16.6	0.166
17	3650	30.4	0.304
18	3450	1253.2	12.532
19	4260	15	0.15
Mean	3810.667	49270.104	492.701

Table(3):-Comparison of mean total Icukocytic count and their chemiluminescence value between control and tcnormin treated groups.

Groups	Sample numbers	Mean total leukocyti c count	Mean chemiluminescen ce value	Mean Time"second s"	Mean chemiluminescen ce value in one second
Control	15	4327.667 A	489946.36 1 A	65.341	7525.992 A
Tinormin treatment	15	3810.6 B	49270.10 B	100	492.701 B

Means bearing different letters vertically differs significantly (P0.01)

Table(4) :- Hematological parameters of control and tenormin treated groups.

Control group				Tenormin treated group			
Sample number	**Hb%**	**Total erythrocytic count**	**Total leukcytic count**	**Sample number**	**Hb%**	**Total erythrocytic count**	**Total leukocytic count**
1	11.2	5340000	4000	3	10	3170000	2550
2	11.2	4960000	3800	4	10.2	3012500	3000
5	12.2	5150000	4500	6	10.4	3135000	2300
8	13	5460000	4650	7	9.8	2950000	3450
20	12.8	6330000	4200	9	8.5	3720000	2950
21	13.5	5650000	4300	10	11	3060000	3700
22	11.8	5230000	4100	11	13.2	3750000	4950
23	11.6	5010000	3920	12	13.5	3250000	3800
24	12.1	5120000	4210	13	11.5	3118000	6000
25	12.9	5310000	4350	14	9	2400000	3750
26	12.7	6220000	4420	15	11	2780000	4200
27	13.5	6550000	4530	16	10	2390000	5150
28	13.4	5450000	4620	17	11	4630000	3650
29	13.6	5740000	4380	18	13	2850000	3450
30	13.9	6425000	4935	19	10.8	1870000	4260
Mean	12.627	5596333.3	4327.667	Mean	10.86	3072000	3810.6

Table(5) :- Comparison between means of sonic liematological parameters of control and Tenormin treated groups.

Groups	Number of samples	Hb%	Mean erythrocytic count	Mean total leakocytic count
Control	15	12.627 A	5596333 A	4327.6 A
Tenormin reated	15	10.86 B	3072000 B	3810.6 B

Mean bearing different letters vertically differs signil1r;intly (P<0.01)

دراسة تأثير المعالجة بالعقار المثبط لارتفاع ضغط الدم "تينورمين" في بعض الصفات الدموية وفي نشاط الكريات الدموية البيضاء المعزولة مقاساً بطريقة التألق الكيماوي

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الخلاصة

أجريت هذه الدراسة على ثلاثين عينة دم سحبت نصفها من رجال مصابين بارتفاع ضغط الدم ويتعاطون عقار "التينورمين" بجرعة مئة ملغم على هيئة قرص عن طريق الفم يومياً وسحب خمسة عشر نموذج دم أخر من رجال اصحاء بنفس الاعمار لايتعاطون أي عقار ودرست بعض معايير الدم كنسبة خضاب الدم (الهيموغلوبين) وعدد كريات الدم الحمر والبيض كما وتم عزل الخلايا الدموية البيض ودرس نشاطها بطريقة التألق الكيمياوي، وكانت هذه التحاليل تجرى لكل من عينات دم المرضى المعالجين بالتينورمين وكذلك الاصحاء بنفس الوقت وأوضحت النتائج بأن تعاطى عقار التينوؤمين بجرعة مئة ملغم عن طريق الفم ولمدة طويلة يؤدي الى هبوط معنوي في العدد الكلي للخلايا الدموية الحمر والبيض وكذلك في نسبة خضاب الدم (الهيموغلوبين) كما ويؤدي الى تقليل أو تثبيط نشاط الخلايا الدموية البيضاء كما أتضح ذلك من النقص الشديد والمعنوي في تألقها الكيمياوي الناتج من ضعف تفاعلها مع المادة المتألقة الموضوعة معها في جهاز التألق الكيمياوي وهذا دليل على ضعف قابليتها المناعية الناتجة من قلة نشاطها المؤدي الى قلة انتاجها لبيروكسيد الهيدروجين الي يتفاعل مع المادة المتألقة لكي يبعث فوتونات ضوئية تقاس بجهاز التألق الكيمياوي ها بالإضافة الى نقصان أعدادها بشكل معنوي مقارنة بالصفات الدموية للاشخاص الاصحاء.

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