



Original Article

Prevalence and Treatment of Hypertension in District Bhimber, Azad Jammu and Kashmir

Nargis Rehman¹, Mr Izharullah², Jawad Zaheer², Muhammad Akram^{3*}, Suresh Ghotekar^{4*}, Muhammad Idrees Khan³

¹Department of Eastern Medicine and Surgery, Faculty of Medical and Health Sciences, University of Poonch, Rawalakot, Azad Jammu and Kashmir, Pakistan

²Department of Pharmacy, Faculty of Medical and Health Sciences, University of Poonch, Rawalakot, Azad Jammu and Kashmir, Pakistan

³Department of Eastern Medicine, Government College University, Faisalabad, Pakistan

⁴Department of Chemistry, Sanjivani Arts, Commerce and Science College, Kopergaon 423 603, Savitribai Phule Pune University, Maharashtra, India

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ABSTRACT

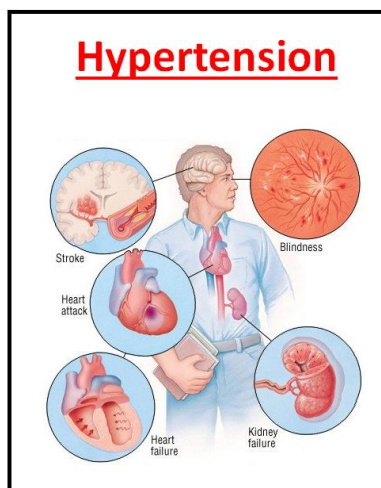
Hypertension is defined as a persistent elevation in blood pressure. Hypertension is also called as silent killers as mostly it is asymptomatic. Hypertension can be due to increased heart rate and blood volume. Hypertension is also due to elevated peripheral vascular arteriolar smooth muscle pitch. Major signs and symptoms of hypertension are blurred vision, confusion, irregular heartbeat and shortness of breath. Hypertension is classified into two major categories including, primary hypertension and secondary hypertension. Hypertension complications are hemorrhage, atherosclerosis, renal artery stenosis, angina pectoris, myocardial infarction, and retinopathy. Estimated global prevalence of hypertension is high long term projections suggested that by 2025 (29%) of adult worldwide are suffering from hypertension (1.56 billion). To determine the exact prevalence of hypertension in district Bhimber, Azad Jammu and Kashmir to relate with rural areas and urban areas, gender, ages, marital status, occupation, smoking and about treatment of hypertension. House to house surveys of targeted locations of tehsil Bernala, tehsil Bhimber and district head quarter hospital Bhimber. Data was collected from December 15th 2017 to April 22nd 2018. Total of 1200 houses randomly selected from tehsil Bhimber and tehsil barnala. Total 2691 subjects were surveyed from 1200 houses from both rural and urban areas of tehsil Bhimber and tehsil barnala 759 subjects out of 2691 subjects were hypertensive. Overall prevalence of hypertension in district Bhimber was 28.20%, this survey representing that 118615.968 population out of 420624 unfortunately suffering hypertension in district Bhimber. There is a need to control and prevent the complications to hypertension. Specially promote awareness about the treatment of hypertension. This survey indicates the high prevalence, poor treatment and control of hypertension.

* Corresponding author: Muhammad Akram; Suresh Ghotekar

✉ E-mail: makram_0451@hotmail.com ; ghotekarsuresh7@gmail.com

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GRAPHICAL ABSTRACT



Introduction

Blood pressure is the force of blood pushing against walls of blood vessels and it is measured in mm Hg. Blood pressure is divided into systolic and diastolic blood pressure. Normal Systolic blood pressure is ≥ 120 mmHg and normal diastolic blood pressure is ≥ 120 mmHg. High blood pressure also called as hypertension (HBP) means the pressure in arteries is higher than normal. Hypertension is defined as persistent elevation in blood pressure. Hypertension is also called as silent killers because mostly it's asymptomatic [1]. Hypertension is also due to the elevated peripheral vascular arteriolar smooth muscles pitch which results in increased arteriolar resistance. Additionally, hypertension

is resulted from the reduced capacitance of the venous system. Mostly the increased tone of vascular system is unknown. Major sign and symptoms of hypertension are blurred vision, confusion, irregular heart beat and shortness of breath. Some with high blood pressure report headaches (particularly at the back of the head and in the morning), as well as lightheadedness, vertigo, tinnitus (buzzing or hissing in the ears), altered vision or fainting episodes. These symptoms, however, might be related to associated anxiety rather than the high blood pressure itself. Blood pressure 140/90mmHg, at least two readings on separate occasions is considering hypertension (Table 1)[2].

Table 1: Hypertension is classified according to the recommendations of seventh Joint National Committee (JNC-7)

Blood pressure category	Systolic (mm Hg)	Diastolic (mm Hg)
Normal	Less than 120	Less than 80
Elevated	120-129	Less than 80
Stage I Hypertension	130-139	80-89
Stage II Hypertension	140 or higher	90 or Higher
Hypertensive crisis	Greater than 180	Greater than 100
Malignant hypertension	Greater than 200	Greater than 110

Borderline hypertension (pre-hypertension) may cause significant rises in strokes and cardiovascular death [3]. Etiology of hypertension includes numerous factors. These factors include genetic factors, lack of exercise, cigarette smoking, excessive salt consumption,

heavy alcohol use, polycythemia, low potassium intake, and NSAIDs use. Other important factors include sympathetic to activity, insulin activity, insulin resistance and excessive potassium [4]. Hypertension is classified into two major categories according to etiology such as primary

hypertension and secondary hypertension. Firstly, the hypertension is classified as primary or essential hypertension and accounts for 95 % of total hypertension. Primary hypertension is idiosyncratic in nature. The primary hypertension are more likely developed in patients with a variety of risk factors. These risk factors are including the black race, family history of hypertension, Dyslipidaemia, alcohol intake, obesity and the personal attitude [5]. Secondly, hypertension is classified as secondary or non-essential hypertension and accounts for only 5% of total hypertension. While, secondary hypertension possesses numerous known causes and onset is usually 25-55 years. It is less developing in persons less than 25 years of age. Secondary hypertension is more likely and investigations should be performed to rule out secondary causes in these patients. Causes of secondary hypertension include primary renal disease, renovascular disease, endocrine disorders, Pheochromocytoma, cushing syndromes and primary Aldosteremia. Secondary hypertension in patients before 20 and 50 years are related with clinical or biochemical features of specific disorder. Patients have previously controlled hypertension but now become refractory to treatment and accelerated hypertension [6].

Hypertension is greater threat factors of numerous vascular diseases e.g. coronary heart diseases, cardiac failure (CF), stroke and end stage renal failure. Additionally, hypertension possesses numerous complications that are life threatening. These complications are hemorrhage, atherosclerosis, renal artery Stenosis, angina pectoris, myocardial infarction and retinopathy. Therefore prevention of hypertension is important factors to manage above mentioned complications. There are many factors which cause hypertension and these are classified as non-modifiable factors and modifiable risk factors respectively [7]. Age, gender, genetic factors and race are non-modifiable factors. Additionally, modifiable factors are overweight, high sodium intake, low

potassium intake, alcohol consumption and reduced physical activity. So, present national recommendation and guidelines promoted the life style modifications which are necessary to control hypertension. These life styles changes ranging from weight loss if the patient is obese and engagement of regular physical activity. Furthermore, reduction in sodium intake and very low alcohol consumption will help to reduced hypertension in hypertensive patient [8]. Pregnancy complications are also a significant concern because hypertension during pregnancy causes about 5% of deaths. This mortality rate is due to the fluid accumulation in the lungs and acute pulmonary edema (APO). These life-threatening complications to maternal hypertension are observed predominantly in women with preeclampsia and eclampsia. These indications are closely related to increased maternal age, delivery through caesarean section, body mass index, parity and undiagnosed cardiomyopathy.

Following classes of drugs is used as a therapy and these include Diuretics, Alpha blockers, Beta Blockers, ACE inhibitors, Angiotension receptors blockers (ARBs), rennin inhibitors, calcium channel blocker, aldosterone antagonists and centrally acting vasodilators [9].

Data was collected from 1988-1991 and (24%) of the US adult population represent of 4, 31, 86,000 person had hypertension. Overall, two-thirds of the populations with hypertension were aware that approximately 69% and majority were taking prescribed medication approximately 53%. Almost 13 million adults classified as being normotensive reported being told on one or more occasions that they had hypertension. The 51% of this group reported current adherence to lifestyle changes to control their hypertension [10].

Estimated global prevalence of hypertension is high long term projections suggested that by the Year 2025 (29 %) of adult worldwide are suffering from hypertension (1.56 billion). Data from 2011-2014 demonstrated that 46% of adults 18 year and older in United States had hypertension (define as >130 systolic and

>80mmHg) upon size of the adult population. This translates 103 million adults with hypertension [11]. In 2017 American college of Cardiology/American Heart association/AHA has redefine hypertension. Prevalence of hypertension (defined as systolic pressure ≥ 140 mmHg or diastolic pressure ≥ 90 mmHg) was 32% and had remained relatively constant since 1999 [12].

In all WHO regions, men have slightly higher prevalence of raised blood pressure than women. Worldwide prevalence of hypertension was 1.39 billion persons, representing 31% of all adults

this represented 5.2% increases in the global prevalence between 2000-2010. The overall prevalence of hypertension was 26% (95% C.I. 23, 29), the prevalence among males (34%) was higher than females (24%). The crude prevalence of hypertension was 35.1% and age standardized prevalence was 34.4% [13].

Cardiovascular diseases caused 2.3 million deaths in India in the year 1990. This is projected to double by the year 2020. Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India (Table 2).

Table 2: Prevalence of known hypertension in different countries

Country	Men (%)	Women (%)	Both Sexes (%)
India-R	5.7	8.8	7.2
India-U	13.2	18.7	15.8
Maldives	8	9	8.5
Myanmar-R	10.8	17.3	14.2
Myanmar-U	14.1	22.2	18.3
Nepal	6.9	7.2	7
All(range)	6-14	7-22	7-16

In Pakistan the average 3 or more medicines are prescribe per patient in case of hypertension. In private sector average of prescribed medicines per patient are 4.1. Meanwhile for hypertension in public sector average of drug prescribed per patient are 2.7, respectively [14].

Hypertension is also an important health problem of Azad Jammu and Kashmir and according to recent research one in four people are suffering from hypertension. Bhimber is the southernmost of the eight districts of Azad Jammu and Kashmir. It borders Indian administered Kashmir to the east. The district is located between latitude: 32-48 to 33-34 and longitude: 73.55 to 74-45, and has an area of 1516 km². The chief town is Bhimber. The total area of the district is 1516 square kilometers and is sub-divided into three Tehsil: Bhimber, Bernala and Samahni [15].

According to the 2017 census, the total population of the district stands at 420,624. In

district Bhimber Azad Jammu and Kashmir, work has not been reported about the prevalence of hypertension. Therefore, this research work was designed to estimate the prevalence of hypertension in district Bhimber Azad Jammu and Kashmir. In district head quarter hospital Bhimber Azad Jammu and Kashmir total number of patients ages from 15-49 and 50+ males and females who visited in general OPD in 2017 were 36473 and 1970 (5.4%) subjects were hypertensive [16].

Material and methods

The current study was a community-based house to house survey that was conducted in the rural and urban area of district Bhimber. The study was conducted in DHQ hospital Bhimber and rural and urban areas of district Bhimber. The data were collected from December 15th 2017 to March 20th 2018. Survey was randomly conducted including male and females ≥ 18 age

group. All adults of ages ≥ 18 male and females and permanent resident are included in present study. Meanwhile, pregnant women, migrants and male and female less than 18 years were excluded from current study. Data was collected randomly from two tehsil of district Bhimber, 600 houses from tehsil Bhimber and 600 houses from tehsil Bernala respectively. In district Bhimber we selected 300 houses of village sokasan and 300 houses of city Bhimber simultaneously. Meanwhile, in tehsil Bernala, we selected 300 houses of village kadhala and 300 houses of city Bernala simultaneously. Data was collected by written permission from medical superintendent DHQ Hospital Bhimber Azad Jammu Kashmir of general OPD for surveys. I took consent for taking measurement of blood pressure and then performed measurement of blood pressure. After collection data was analyzed using different statistical techniques.

Result and Dissection

One in fourth adults over 18 years of age is hypertensive and smoking level is high (38% among men and 7% women). As a consequence, 1/4th of populations over 40 years suffer from a

cardiovascular disease and one third from raised cholesterol. In district head quarter hospital Bhimber azad jammun and Kashmir total number of patients ages from 15-49 and 50+ males and females who visited in general OPD in 2017 were 36473 and 1970(5.4%) subject's hypertensive. Hypertension is a global health problem and according to recent research one in four people have hypertension.

In district Bhimber Azad Jammu and Kashmir, work has not been reported about the prevalence of hypertension. Therefore, this research work was designed to estimate the prevalence of hypertension in district Bhimber Azad Jammu and Kashmir. In this study prevalence of hypertension was investigated in district Bhimber Azad Jammu Kashmir. In tehsil Bernala 321 (25.04%) out of 1260 were hypertensive. prevalence was high in urban area of tehsil Bernala (29.30%) followed by rural area (21.46%). The data also shows that prevalence was high in males (34.24%) than females (23.63%). The prevalence of hypertensive patients in Tehsil Bhimber and Bernala was tabulated in Table 3.

Table 3: Prevalence of hypertensive patients in Tehsil Bhimber and Bernala

District Bhimber	Total Subjects	Total hypertensive	Percentage
Tehsil Bhimber 300 Homes (Rural area)			
Male	126	48	38.09
Female	531	141	26.55
Tehsil Bhimber 300 Homes (Urban area)			
Male	126	45	35.71
Females	648	204	31.48
Tehsil Bernala 300 Homes (Rural Area)			
Male	129	36	27.9
Female	486	96	19.75
Tehsil Bernala 300 Homes (Urban Area)			
Male	90	39	43.3
Females	555	150	27.02
Total 400	2691	759	28.20 %

Data indicated that prevalence of hypertension in tehsil Bhimber was 146 (30.60%) out of 477. Total prevalence of hypertension was high in urban area of tehsil Bhimber (32.17%) followed by rural area of tehsil Bhimber Sokasan

(28.76%). The data also shows that prevalence rate was high in males (30.90%) as compared to females (29.26%). The overall mean prevalence of district Bhimber was 28.20% out of the four locations. The highest prevalence rate was found

in tehsil Bhimber urban area 32.17%, followed by the tehsil Bernala urban area (29.30%). Additionally, lowest prevalence rate was found in tehsil Bernala rural area (21.46%) followed by tehsil Bhimber rural area (28.76%). The overall mean prevalence of district Bhimber was higher in urban area 30.86% followed by rural areas 25.23%. Furthermore, the higher prevalence was found in rural and urban areas of tehsil Bhimber followed by tehsil Bernala.

The targeted locations of rural and urban area were analyzed for prevalence of hypertension. Total subjects (1272) of rural and 1419 of urban area were analyzed for presence of hypertension. Among 1272 of rural area patients 321 were hypertensive and percentage of 25.23%. Among 1419 of urban area patients 438 were hypertensive and percentage of 30.86 %. Among these patients 2241 were married and 450 were unmarried. Among 2241 married patients total of

732 were hypertensive and percentage was 32.66 %. Among 450 unmarried patients total of 27 were hypertensive and percentage was 6 %. Important co-morbidities of hypertension are smoking and diabetic. Among these co-morbidities total 225 patients were smoker and 171 were diabetics. Out of 225 smokers patients 135 were hypertensive and total percentage of 60 %. Out of 171 diabetic patients 165 were hypertensive and total percentage of 96.49 %. Hypertensive can be due to known or unknown causes. Among total of 666 known causes 600 and total percentage of 87.74 % were hypertensives. Furthermore, total of 93 unknown causes 12 and total percentage of 12.25 % were hypertensive. Among 666 total known hypertensive patients 264 were taking regular medicines. A targeted location, marital status, co-morbidities, known and unknown causes are tabulated in Table 4.

Table 4: Types of hypertensive patients

Targeted locations	Total Subjects	Total hypertensive	Percentage
Rural areas	1272	321	25.23 %
Urban Area	1419	438	30.86 %
Marital Status			
Married	2241	732	32.66 %
Unmarried	450	27	6 %
	Tehsil Bernala		
Co-morbidities			
Smoking	225	135	60 %
Diabetic	171	165	96.49 %
Known and Un-known Causes			
Known cases	666	600	90.09 %
Unknown Cases	93	12	12.90 %
Known patients and Taking regular medicines			
Total Known hypertensive patients	666	Taking Regular medicines	264

The overall mean prevalence of district Bhimber was higher in urban area 30.86% followed by rural areas 25.23% respectively. The higher prevalence was found in rural and urban areas of tehsil Bhimber followed by tehsil Bernala. Research shows that 135(60%) out of 225 smokers were hypertensive and 165(96.49%) diabetic out 171 were hypertensive.

According to my survey total number of hypertensive patients in district Bhimber Azad

Jammu and Kashmir were 759 out of 897.222 (87.74%) were known patients of hypertension and 93(12.25%) patients were unknown patients of hypertension. unfortunately only 264 known cases of hypertensive patients taking their regular medication out of 666 patients with total 39.63% percentage.

High blood pressure also called as hypertension (HBP) means the pressure in arteries is higher than normal. Hypertension is defined as

persistent elevation in blood pressure. Blood pressure 140/90 mmHg, at least two readings on separate occasion is considering hypertension [17]. Hypertension is also called as silent killer because mostly it's asymptomatic. Major sign and symptoms of hypertension were found to be headache, blurred vision, confusion, irregular heartbeat, and shortness of breath. Hypertension is highly variable phenomenon and it is not possible to determine the prevalence of hypertension in single reading. Diagnosis of hypertension made after multiple readings on different occasions [18].

Worldwide, hypertension is estimated to cause 7.5 million deaths, about 12.8% of the total of all deaths. Raised blood pressure is major risk factor for coronary heart disease and ischemic as well as hemorrhagic stroke, in addition to coronary heart disease and stroke complication of raised blood pressure include heart failure, peripheral vascular diseases, renal impairment, retinal hemorrhage and visual impairment. One in fourth adults over 18 years of age is hypertensive and smoking level is high (38% among men and 7% women). As a consequence, 1/4th of populations over 40 years suffer from a cardiovascular diseases and one third from elevated hypertension [19-20].

In this research study, the prevalence of hypertension was investigated in district Bhimber Azad Jammu Kashmir. Data indicated that prevalence of hypertension in tehsil Bhimber was 438 (30.60%) out of 1431 patients. Prevalence of hypertension was high in the urban area of tehsil Bhimber (32.17%), followed by the rural area of tehsil Bhimber, Sokasan (28.76%). The data also indicates that prevalence rate was high in males (30.90%) than females (29.26%). In tehsil Bernala 321 (25.04%) out of 1260 patients were hypertensive. Prevalence was high in urban area of tehsil Bernala (29.30%) followed by rural area kadhala (21.46%). The data also shows that prevalence was high in males (34.24%) than females (23.63%). The results of prevalence of hypertensive patients in Tehsil Bhimber and Bernala are tabulated in (Table 3).

Total subjects (1272) of rural and 1419 of urban area were analyzed for presence of hypertension. Among 1272 of rural area patients 321 were hypertensive and percentage of 25.23%. Among 1419 of urban area patients 438 were hypertensive and percentage of 30.86 %. Among these patients 2241 were married and 450 were unmarried. Among 2241 married patients total of 732 were hypertensive and percentage was 32.66 %. Among 150 unmarried patients total of 27 were hypertensive and percentage was 6 %. Important co-morbidities of hypertension are smoking and diabetic. Among these co-morbidities total 732 patients were smoker and 171 were diabetics. Out of 225 smokers patients 135 were hypertensive and total percentage of 60 %. Out of 171 diabetic patients 165 were hypertensive and total percentage of 96.49 %. Hypertensive can be due to known or unknown causes. Among total of 666 known causes of hypertension approximately 600 were hypertensive and total percentage was 87.74 %. Furthermore, among total of 93 unknown causes 12 were hypertensive and total percentage of 12.25 %. Among 666 total known hypertensive patients 264 were taking regular medicines. A targeted location, marital status, co-morbidities, known and unknown causes was tabulated in Table 4.

Present study demonstrated that the prevalence of hypertension was higher in the urban and rural area of tehsil Bhimber as compare to urban. This house to house survey indicates that overall prevalence of hypertension in district Bhimber was 28.20%. high prevalence in urban areas then rural areas of district Bhimber. prevalence of hypertension high in tehsil Bhimber as compared to tehsil Bernala.. Tehsil Bhimber is the biggest tehsil of district Bhimber and approximately all the basic facilities are available in tehsil Bhimber. Additionally, living styles of 80 to 90% peoples was very luxurious with no heavy physical activities. Furthermore, females are job going and few women were housewives. Males have not hard work at homes and males are also job going. Present study shows that prevalence of

hypertension higher in the urban and rural area of tehsil Bhimber as compare to urban and rural area of tehsil Bhimber.

Tehsil barnala rural areas were very close to nature almost all the population of tehsil barnala rural area kadhala have their own fields and cattle at their homes and they have heavy physical activates and eating and drinking fresh foods. This targeted area had low rate of prevalence then three other targeted location.

According to this survey rate of prevalence of hypertension was at alarming condition (28.20%). Approximately 39.63% of known hypertensive patients took medicine regularly. About 60.37% take this alarming condition as an infectious disease that can be treated by medication of 5-7 days. We conducted this survey under our supervision, and we realized they are well aware of the hypertension complications but, unfortunately, not about the way of treatment. There is need to aware them through different ways like radio and televisions programs about treatment and benefits of regular medications. Regular medications can prevent hypertensive patients from further complications like renal impairment and coronary artery diseases and ischemic heart diseases.

Conclusion

The estimated global prevalence of hypertension is high long term projections suggested that by the 2025 (29 %) of adult worldwide are suffering from hypertension (1.56 billion). House to house survey of targeted locations of tehsil Bernala, tehsil Bhimber and district headquarter hospital Bhimber. Data was collected from 15 December 2017 to 22 April 2018. Overall prevalence of hypertension in district Bhimber was 28.20%, this survey representing that 118615.968 population out of 420624 unfortunately suffering hypertension in district Bhimber. Prevalence rate was higher in male (35.66%) as compared to (26.62%) females and prevalence of hypertension higher in urban area (30.86%) than rural area (25.23%). Simultaneously, prevalence of hypertension is higher in married 32.66% as

compared to unmarried 6%. Moreover, 87.74% subjects known cases but only 39.63% patients taking their regular medications and 60.37% patients not taking medications regularly. 60% smokers and 96.49% diabetic patients were hypertensive. There is a need to control and prevent the complications of hypertension. Specially promote awareness about the treatment of hypertension. This survey indicates the high prevalence and poor treatment and control of hypertension. This is alarming condition. Celebrate world hypertension day every 17 May in schools, colleges, universities and all the hospitals. Also, pharmaceutical companies should arrange free campus in health units.

Conflict of Interest

We have no conflicts of interest to disclose.

References

- [1]. Sembulingam K., Sembulingam P., *Essentials of medical physiology*. JP Medical Ltd. 2012
- [2]. Giles T.D., Materson B.J., Cohn J.N., Kostis J.B., *J. Clin. Hypertens*, 2009, **11**:611
- [3]. Muntner P., Carey R.M., Gidding S., Jones D.W., Taler S.J., Wright J.T., Whelton P.K., *J. Am. Coll. Cardiol.*, 2018, **71**:109
- [4]. Gifford Jr R.W., *Hypertension*, 1988, **11**:65
- [5]. Burt V.L., Whelton P., Roccella E.J., Brown C., Cutler J.A., Higgins M., Horan M.J., Labarthe D., *Hypertension*, 1995, **25**:305
- [6]. Shafi, S.T., Shafi, T., *J. Epidemiol. Global Health*, 2017, **7**:135
- [7]. Reynolds K., Gu D., Muntner P., Wu X., Chen J., Huang G., Duan X., Whelton P.K., He J., *J. Hypertens.*, 2003, **21**:1273
- [8]. Matar D., Frangieh A.H., Abouassi S., Bteich F., Saleh A., Salame E., Kassab R. Azar R.R *J. Clin. Hypertens.*, 2015, **17**:381
- [9]. Fisher N.D., *Harrison's principles of internal medicine*. 2005
- [10]. Slama M., Susic D., Frohlich E.D., *Curr. Opin. Cardiol.*, 2002, **17**:531

- [11]. Thornton C.E., Von Dadelszen P., Makris A., Tooher J.M., Ogle R.F., Hennessy A., *Hypertens. Pregnancy*, 2011, **30**:169
- [12]. Tarazi R.C., Miller A., Frohlich E.D., Dustan H.P., *Circulation*, 1966, **34**:818
- [13]. Sacks F.M., Campos H., *N. Engl. J. Med.*, 2010, **362**:2102
- [14]. Healey J.S., Connolly S.J., *Am. J. Card.*, 2003, **91**:9
- [15]. Ellory J.C., Stewart G.W., *Br. J. Pharmacol.*, 1982, **75**:183
- [16]. Zillich A.J., Garg J., Basu S., Bakris G.L., Carter B.L., *Hypertens.*, 2006, **48**:219
- [17]. Gorre F., Vandekerckhove H., *Acta Cardiol.*, 2010, **65**:565
- [18]. Trevor J.A., Katzung G.B., Masters B.S., KATZUNG & TREVAR'S Pharmacology 9th Edition, 261
- [19]. Trevor, J.A., Katzung, G.B., Masters, B.S., KATZUNG & TREVAR'S Pharmacology 9th Edition, 268
- [20]. Delyani J.A., Rocha R., Cook C.S., Tolbert D.S., Levin S., Roniker B., Workman D.L., Sing Y.L.L., Whelihan B., *Cardiovasc. Drug Rev.*, 2001, **19**:185

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