

## Knowledge and awareness of Hypertension among Medical Students and Junior Doctors at Government Medical College and Rajindra Hospital Patiala, Punjab

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### Abstract:

**Background:** Hypertension is the commonest cardiovascular disorder and more than one billion adults suffer from it. The purpose of this research study was to evaluate the knowledge about hypertension among medical students, interns and residents working in GMC & RH Patiala.

**Materials and Method:** This descriptive cross-sectional study was conducted from Jan 2017 to Feb 2017 at GMC & RH Patiala on 450 participants (Final year students, Interns and residents). Our study consists of a structured, questionnaire containing multiple choice 10-item questionnaire which was focusing on diagnostic issues of hypertension (four questions), Pharmacological treatment of hypertension (three questions), therapeutic strategies regarding hypertension (two questions) and target BP (one question).

**RESULTS:** All the questionnaire sheets were collected and analyzed in a blinded fashion for protection of personal data. The number of answers in agreement with WHO/ISH guidelines was used as an awareness measure. A score of 1 point was attributed to each correct answer to the questionnaire. This was considered adequate if correct answers to six out of 10 questions. Our study showed that overall only 157 (34.88%) subjects possessed adequate knowledge of hypertension. This was higher among residents 57 (45%), followed by medical students 9 (35.38%) and interns 8 (29.02%).

**Conclusion:** This study has highlighted obvious deficiencies in the knowledge of the junior and future doctors of Government Medical College & Rajindra Hospital Patiala regarding hypertension, its risk factors, diagnosis and treatment. Promotion of evidence based curriculum is likely to plug the gap in deficient knowledge of our future physicians. Therefore, further efforts are required to intensify information strategies for improving professional education and training of our medical students, interns and residents.

**Keywords:** hypertension, interns, medical students, questionnaire, residents.

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### I. Introduction

Hypertension is a highly prevalent, chronic, sometimes acute, condition characterized by an abnormally raised blood pressure resulting in end organ damage. It serves as barometer of effectiveness of public health education, professional education, health care system effectiveness in this country.

Hypertension is strictly limited to arterial blood pressure. Normally the maximum pressure exerted via blood on the arterial walls by the heart during a contraction (systolic pressure), is below 140 mmHg while the minimum pressure on the arterial wall when the heart is relaxing between contractions is below 90 mmHg (diastolic pressure). When the cause is unknown it is designated essential hypertension. This has a genetic link within families.

Secondary hypertension is where the cause is identified as in: chronic kidney disease; adrenal gland disorder, pregnancy or drug induced hypertension<sup>1</sup>. Cardiovascular disease is responsible for one third of global death. Importantly, CVD is eminently preventable; to achieve significant reduction in CVD, Combination of population based and high risk strategy is necessary. Hypertension is estimated to cause 71 million premature deaths and is estimated to cause 4.5% of current global disease burden, prevalent in many developing countries, as in developed world.<sup>2</sup>

Hypertension plays major etiologic role in development of cerebrovascular disease, Ischaemic heart disease, cardiac disease and renal failure. Treating hypertension has been associated with 40% reduction in risk of stroke, 15% reduction in risk of myocardial infarction. Although hypertension has been shown to prevent cardiovascular disease and to prolong life duration, still hypertension remains inadequately managed disease. Due to a higher growth rate, lower socioeconomic status and presence of a greater array of risk factors, developing nations will constitute the bulk of this increase. The risk of death is maximum from cardiovascular diseases.<sup>3</sup> Undiagnosed, uncontrolled and inappropriately managed hypertension is associated with a high risk for morbidity and mortality from potentially preventable complications such as stroke, and kidney and heart diseases.<sup>4</sup> Hypertension has affected 26.4% of the world's adult population (972 million) in 2000, and the rates are expected to increase to 29.2% (1.56 billion) by 2025.<sup>4</sup> According to WHO health statistics 2012, the prevalence of hypertension in India was 23.1% in men and 22.6% in women in equal or more than 25 years age.<sup>5</sup> In Punjab state the prevalence of hypertension is approximately 14.5% in rural and 22.8% in urban areas respectively.<sup>5</sup>

There are several risk factors contributing to hypertension, such as age, gender and ethnicity, Positive family history, being overweight and obese are also additional risk factors. Other lifestyle factors that contribute to hypertension are –smoking, stress, cell phone use and physical inactivity and, consumption of alcohol, increase salt intake, reduced potassium intake and high fructose. Chronic diseases like diabetes, renal insufficiency, and obstructive sleep apnea are directly linked to hypertension. it is more common in men above 55 years.

People diagnosed with hypertension demand pharmacological and non pharmacological treatment. Management comprises of different categories of prevention and treatment of patient diagnosed with hypertension. Prevention is done at primary, secondary and tertiary levels. According to DASH (Dietary Approaches to Stop Hypertension Diet) in year 2012 studied, less salt serving at tables makes the blood pressure low, it also decreases cardiovascular events which includes Hypertension as well. The DASH diet highlights more on fruits, vegetables, and low-fat dairy products and is reduced in fat and cholesterol.<sup>6</sup>

Realizing the need for uniform guidelines for the management of this disease, World Health Organization(WHO) and International Society of Hypertension (ISH) had proposed guidelines, which helped to reduce inappropriate approaches and have proved to an evidence based, cost effective option for treating patients. Despite of all the present evidence, this potentially lethal chronic disease continues to be inadequately diagnosed and treated.

A global capacity assessment survey conducted by WHO showed that there is wide variation in capacity for management of hypertension in various countries. Of 167 countries surveyed national hypertension guidelines were not available in 61%, health profession were not trained to manage hypertension in 45%, Anti hypertensive were not affordable in 25%, basic equipment and drugs for management of hypertension were not available in primary health care.

Undergraduate and post graduate trainees assume an imperative role in any health care system, since they are the future health care professionals of any society. Realizing the need for uniform guidelines for the management of this common condition, we assessed awareness of current recommendations about hypertension management on medical students, interns, and residents at GMC & RH medical college using the World Health organization/International Society of Hypertension (WHO/ISH) 1999 guidelines as reference.

The purpose of this research study was to evaluate the knowledge about hypertension among medical students, interns and residents working in GMC & RH Patiala.

## **II. Materials &Methods**

**Study Setting:** This descriptive cross-sectional study was conducted from Jan 2017 to Feb 2017 at GMC & RH Patiala which is one of the reputed Government Medical institutions in Punjab .The sample size of 450 participants (Final year students, Interns & Post Graduate Students) was taken. The hospital has about approx 100 plus resident doctors enrolled in various postgraduate programs and 200 Final year students and 200 Interns every year and many patients from Patiala city and surrounding rural areas get benefit from medical services of the hospital annually. Total students in this institute are approximately 1500 including undergraduate and post graduate students.

**Study population:** PG (Post Graduate) trainee medical doctors are called as resident doctors. Both resident doctors and interns who are often engaged in handling patients and are responsible for supervision and management of patients in the wards, outpatient department and in emergency. Similarly Final year students who have studied in detail about Knowledge, Awareness and Prevalence of Hypertension in their curriculum, work in coordination under the supervision of senior doctors to serve admitted patients. Status of knowledge, attitude and perception on health care ethics in Government Medical College and Rajindra Hospital, Patiala is therefore best reflected from Final year medical students and junior doctors.

### **Questionnaire:**

Our study consists of a structured, questionnaire containing multiple choice 10-item questionnaire which was focusing on diagnostic issues of hypertension (four questions), Pharmacological treatment of hypertension (three questions), therapeutic strategies regarding hypertension (two questions) and target BP (one question).

The questionnaire was discussed with the teaching faculty members and consultants who had been treating hypertensive patients. The questionnaires were distributed among participants after ensuring anonymity and taking informed consent. They were asked to fill the questionnaire under supervision for which ample time was provided. Final year medical students were contacted at their hostels. Interns and residents were contacted at Civil Hospital, emergency medicine ward, chest and TB hospital, gynaecology and paediatric ward in Rajindra Hospital Patiala.

### **DATA Collection and Analysis:**

All the questionnaire sheets were collected and analyzed in a blinded fashion for protection of personal data. The number of answers in agreement with WHO/ISH guidelines was used as an awareness measure. A score of 1 point was attributed to each correct answer to the questionnaire. This was considered adequate if correct answers to six out of 10 questions. Incompletely filled questionnaires were eliminated. The data was expressed as percentage of participants correctly responding to each question. The data was expressed as means or percentage of participants correctly responding to each question. Consent of each participant was obtained.

### **Exclusion criteria**

Exclusion criteria were medical students from first to fourth year, faculty members and those who had completed their residency but were working as Registered Medical Officers (RMOs) in GMC & RH Patiala.

#### **• Table 1 Multiple choice questionnaire on WHO/ISH guidelines**

1. Which are the BP values, that after repeated measurements, define elderly subjects (>65 years) as hypertensive?

- a) **>140/90mmHg**
- b) >135/85mmHg
- c) >165/95mmHg
- d) >150/90mmHg
- e) Other

2. Which are the appropriate examinations to be prescribed for the minimum diagnostic work-up of hypertensive patients?

- a) **Serum potassium, urine analysis, serum creatinine, serum glucose, serum cholesterol**
- b) Serum potassium, urine analysis, urea, serum glucose, serum cholesterol Complete blood count, urine analysis, serum creatinine, serum glucose, serum cholesterol
- c) Microalbuminuria, serum potassium, serum creatinine, serum glucose, serum cholesterol
- d) Serum sodium, serum potassium, serum creatinine, serum glucose, serum cholesterol
- e) other

3. Which is the upper normal value for self-measured BP in hypertensive patients on antihypertensive treatment?

- a) 140/90mmHg
- b) 135/85mmHg
- c) 130/85mmHg
- d) **125/80mmHg**
- e) Other

4 Which is the definition of “white coat” or isolated clinic hypertension?

- a) **High office BP; normal ABPM; normal self-measured BP**
- b) High office BP; normal ABPM; high self-measured BP
- c) Normal office BP; high ABPM; normal self-measured BP
- d) Other

5 How long can asymptomatic patients with recently diagnosed grade I hypertension, and no other risk factors stay out of pharmacological treatment?

- a) 1 week
- b) 1 month

- c) 3 months
- d) 4 months
- e) 6 months**
- f) Other

6 Which is the target BP to be reached in a hypertensive diabetic patient?

- a) <140/90mmHg
- b) <150/90mmHg
- c) <120/80mmHg
- d) <130/85mmHg**
- e) Other

7 Which is the most appropriate initial treatment for a 50-year old, grade I hypertensive patient with left ventricular hypertrophy at the echocardiogram?

- a) Lifestyle changes
- b) one-drug therapy**
- c) Association therapy
- d) Other

8 Which is the most appropriate antihypertensive drug class for a hypertensive patient with diabetic nephropathy?

- a) Diuretic
- b) Beta-blocker
- c) Calcium-antagonist
- d) Alfa-blocker
- e) ACE-inhibitor**
- f) Other

9 Which is the drug of third choice for an essential hypertensive patient who's BP is partially controlled by an ACE inhibitor plus calcium-antagonist?

- a) Beta-blocker
- b) Alfa-blocker
- c) Diuretic**
- d) Clonidine
- e) Angiotensin II receptor antagonist
- f) other

10 A low dose aspirin for primary prevention in hypertension should be prescribed to:

- a) All hypertensive patients.
- b) Hypertensive patients with a BP well controlled by treatment
- c) Hypertensive patients with a BP well controlled by treatment and high cardiovascular risk**
- d) Other.

The correct answers, according to WHO/ISH guidelines, are in bold.

### III. Results

The result of our study undoubtedly indicated an inadequate level of awareness of diagnosis, work up and treatment of arterial hypertension among our participants at Government Medical College Patiala and Rajindra Hospital Patiala. Of the total participants 333(74%) knew the cut off level of blood pressure to define hypertension in an otherwise healthy person. Our study showed that overall 157 (34.88%) subjects possessed adequate knowledge of hypertension. This was higher among residents 57 (45%), followed by medical students 9 (35.38%) and interns 8 (29.02%). Residents tend to have better knowledge regarding the treatment as 62.5% responded the correct answers regarding treatment questions while only 30% of the interns and 7.5% of the final year medical students were aware of treatment options for hypertension in WHO/ISH QUESTIONARE.

**TABLE 2:** Academic distribution of the subjects with respect to the number of correct answers. The results are shown in terms of frequencies and percentages.

No. of correct answer	Medical students 130 (n)    %		Interns 200 (n)    %		Residents 120 (n)    %	
	0-5	84	64.62	143	70.98	66
6-7	39	30	54	27	48	40

8 or more	7	5.38	3	1.5	6	5
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\*p value=0.0206

**Table 3:** Academic distribution of the subjects with respect to at least six correct answers including the definition of hypertension. The results are shown in terms of frequencies and percentages

Awareness	Medical students		interns		residents		total	
inadequate	84	64.62%	143	70.98%	66	55%	293	65.11%
adequate	46	35.38%	57	29.02%	54	45%	157	34.88%

\*p value=0.01106

Our study showed that residents tend to have better knowledge regarding the treatment (6 out of 10 questions are clinical aspect of hypertension) as 62.5% responded the correct answers about treatment questions while only 30% of the interns and 7.5% of the final year medical students were aware of treatment options for hypertension. Of the total participants, 333(74%) knew the cut off level of blood pressure to define hypertension in an otherwise healthy person. We further explored that out of 64.62% participants of final year medical students, participants which correct 5 questions correctly are 35%, 4 questions correctly are 24%, 3 questions correctly are 5% only. Similarly in interns, % age of correction of five, four and three questions are 40%, 20% and 10% respectively. While in residents result up to 5 questions right are 35% for 5 questions, 15% for 4 questions and 5% for 3 questions.

The question concerning the normality of self-measured BP in hypertensive patients on antihypertensive treatment (no. 3) was the one most often answered incorrectly by all three groups. Only (30%) of total participants were acquainted with the basic definitions including the cut-off levels for blood pressure among the general population in diabetics, in elderly >65 yrs, concept of white Coat hypertension and minimum diagnostic work up of hypertensive patients.

No participant correctly answered all of the 10 questions. Majority of the participants correctly answered 5 or less questions. Chi square analysis was done and p-values were obtained to find out any significant differences in the variables of categorical data considered. The value of <0.05 for p was considered to be statistically significant. Statistically significant difference was noted between the number of correct answers by medical students, interns and residents.

#### IV. Discussion

The present study assessed knowledge and awareness of hypertension in different aspects like definition, symptoms, complication, risk factors and treatment among undergraduate final year medical students, interns and post graduate medical students at Government Medical College Patiala.

The status of hypertension awareness, treatment and control status is very low in India especially in rural subjects.<sup>7</sup>

Dietary modifications (reduced salt, fat and alcohol), regular aerobic exercises, avoidance of tobacco and intoxicants & control of stress with yoga are important non pharmacological methods for prevention and control of hypertension. Many effective drugs are available to control blood pressure. However public awareness, early detection, and improved compliance are major issues which can help to reduce the risks<sup>8</sup>. Study regarding awareness about hypertension done by OK Ale et al, in 2017 shows about awareness of hypertension guidelines and the diagnosis and evaluation of hypertension by primary care physicians in Nigeria. They concluded that there is a gap between guideline recommendations and hypertension care in Nigeria that is further widened by primary care physicians unawareness of the guidelines.<sup>6</sup>

Prompt diagnosis of Hypertension is crucial due to potentially detrimental complications which the untreated condition can pose. Since it remains asymptomatic until late in its course, even newly diagnosed patients are at the brink of developing subtle cardiovascular and end organ damage. But these complications can be avoided with prompt diagnosis and appropriate management.

The result of our study undoubtedly indicated an inadequate level of awareness of diagnosis, work up and treatment of arterial hypertension. Of the total participants 333(74%) knew the cut off level of blood pressure to define hypertension in an otherwise healthy person. This value was 70-90% in Polish medical students.<sup>9</sup>

A multicenter study from Pakistan by Anis Rehman, Tariq Rehman et al about awareness of hypertension among the medical students and junior doctors showed that overall 150 (31.58%) subjects possessed adequate knowledge of hypertension. This was higher among final year medical students 49 (40.50%), followed by residents 39 (30.00%) and interns 62 (27.68%). Nevertheless, residents tend to have better knowledge regarding the treatment as 62.5% responded the correct drugs while only 30% of the interns and 7.5% of the students were aware of treatment options for hypertension.<sup>3</sup>

Even if the relatively low score of 6 (at least six of 10 answers were correct, including answer to question 1) is taken as a threshold level of acceptable awareness, analysis of the replies to the questionnaire

showed that only 34.88% of the participants had adequate knowledge of WHO/ISH guidelines. Similar study done by C Cuspidi, Michev, et al about awareness of hypertension guidelines in primary care: results of a region wide survey in Italy in 2003 showed only 20.1% of the study population correctly answered at least six of the questions (including that on the definition of hypertension in the elderly). Further efforts are required to intensify information strategies for improving professional education, training and practice organization aimed at achieving therapeutic goals.<sup>10</sup>

Similar study done in Belgium by Fagard et al, in 2002, examining the implementation of the 1999 WHO/ISH guidelines for the management of hypertension in a general practice setting in Belgium, found that among patients with mild hypertension who were at high or very-high absolute cardiovascular risk 33%, respectively, remained untreated.<sup>11</sup> Other person who did similar study was Hagemester et al in 2001, reported that adequate awareness of guidelines was present in 19% of general practitioners, 26% of internists and 37% of cardiologists.<sup>12</sup>

Considerably, resident doctors and nurses in one study in Nepal are convinced that doctors are influenced by inducements from pharmaceutical companies. Doctors are lured by offers of drug companies in the form of gifts, sponsorship of seminars and symposiums or continuing medical education in return for prescribing the medications of their brand.<sup>13</sup>

A study on the knowledge and attitudes on advanced life support among medical students and medical officers in a tertiary care hospital in Sri Lanka concluded that: Overall, just over 10 % of participants demonstrated inadequate ALS knowledge scores. A significantly higher proportion of final year medical students had good knowledge, compared to medical officers and 4th year students. Only one-third of participants were confident in saving a life with their current ALS knowledge. Nearly all participants thought that the ALS course should be reevaluated frequently.<sup>14</sup> Similar study related to our study was conducted to evaluate the knowledge about hypertension among dental students working in Saveetha Dental College and Hospitals, Chennai. The study assessed the knowledge and awareness about the etiology and risk factors of hypertension and its association with 100 entry level students in one dental college. Conclusion of study is the knowledge, attitude and awareness on the risk factors, medications and lifestyle practices provides a need to educate and motivate them on hypertension on a regular basis in the curriculum.<sup>15</sup>

## **V. Limitation**

1. The survey was conducted at only one medical college, Patiala and hence does not represent the whole state.
2. Variables such as gender, age, time since graduation, duration of the practice were not considered during the analysis of data in the study.
3. The study population was divided into subgroups such as final year medical students, Interns, and residents, to determine any major differences in the level of awareness between these subgroups. While entry level students and faculty teachers are not included in this study.

## **VI. Conclusion**

Hypertension progressively and permanently damages target organs, leading to life-threatening complications and death. Chronic diseases, such as hypertension, necessitate lifelong drug intake and changes in lifestyle. A lack of knowledge about hypertension negatively influences patients' awareness and behaviors, and is a major obstacle in controlling the disease. Educational interventions are necessary to control hypertension. This study has highlighted obvious deficiencies in the knowledge of the junior and future doctors of Government Medical College & Rajindra Hospital Patiala regarding hypertension, its risk factors, diagnosis and treatment. Promotion of evidence based curriculum is likely to plug the gap in deficient knowledge of our future physicians. Therefore, further efforts are required to intensify information strategies for improving professional education and training aimed achieving therapeutic goals.

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