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Original Research Article

Hypertension and beyond in Indian clinical practice study: a nationwide survey assessing knowledge, attitude and practices of physicians

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ABSTRACT

Background: Hypertension is the leading cause for the ever-increasing burden of mortality due to stroke and cardiovascular diseases (CVD). Treatments are complicated due to comorbidities and can lead to patient noncompliance. Patients with low existing cardiovascular risk are prone to have higher lifetime cardiovascular risk, which timely assessment necessary.
Methods: A digital cross-sectional survey questionnaire about knowledge, attitude and practice habits regarding cardiovascular risk assessment was administered to 400 physicians and cardiologists across India. The questionnaire assessed various topics such as practice of hypertension diagnosis and treatment based on guidelines, cardiovascular risk calculators, occurrence of comorbidities and patient awareness on cardiovascular risk prevention.
Results: Out of the 400 physicians, 398 completed the survey. About 52% physicians considered presence of multiple risk factors as vital for having cardiovascular risk. American college of cardiology/American heart association (ACC/AHA) calculator was preferred by 51.6% study participants. Cardiovascular risk estimation was vital for treatment-related decision-making according to 71% participants, while only 7.7% participants calculated cardiovascular risk in >90% of their patients. Approximately 44% survey participants calculated cardiovascular risk in hypertensive patients with 2 additional risk factors, while 5.6% calculated it in >70% hypertensive patients without comorbidities. About 46.6% participants reported that 30%-50% of their patients were on fixed-dose combinations of two antihypertensive medications.
Conclusions: Findings from the study indicate predisposition of medical professionals towards having a risk assessment tool designed for the Indian population to timely assess and forestall long-term effects of cardiovascular risk in hypertensive patients.

Keywords: Hypertension, Heart failure, Risk calculator, Fixed-dose combinations, Cardiovascular risk, Decision making

INTRODUCTION

Cardiovascular diseases (CVDs) have become a major cause of morbidity and mortality in India, with a higher death rate of 272 per 100,000 population compared to the global average of 235 per 100,000 population.[1] Amongst the CVD risk factors, systemic hypertension remains the leading cause of excessive premature mortality and morbidity. Hypertension has been the primary cause of 57% deaths related to stroke and 25% deaths related to CVD. Furthermore, as per statistics, to lower the CVD mortality by 25% by 2025, the prevalence of hypertension in India must be reduced by 25%.[2]

Various risk factors have contributed to the rise in hypertension in the Indian population. A systematic review and meta-analysis by Raghupathy et al found that age, alcohol, increased salt consumption, smoking and chewing

tobacco, body mass index (BMI), central obesity (defined as waist circumference >90 cm in men and >80 cm in women), less consumption of vegetables/fruits, higher consumption of dietary fat and salt, and sedentary lifestyle are significant factors contributing to increased risk of hypertension.[3] Moreover, as per the prospective urban and rural epidemiological (PURE) study, lower rates of awareness, treatment, and control of hypertension are attributed to lower educational status.[1] Further, studies have shown that age is also a risk factor for hypertension. The incidence of hypertension is about 60% in the elderly population (>70 years).[2] Higher rates of salty food consumption and presence of cardio-metabolic risk factors like central obesity and high BMI have been the major risk factors across eastern and southern India. A multicenter study from India on awareness, treatment, and adequacy of control of hypertension has exhibited that only about 25.6% of treated patients have their blood pressure (BP) under control.[3] Other risk factors for hypertension are lack of awareness about hypertension in patients due to poor literacy, wrong interpretation of medical advice, irregular sources of health-related information, or inadequate counselling regarding hypertension due to skewed doctor–patient ratios in government-run hospitals.[4] Given all these factors, timely and effective identification of patients at risk may help in preventing hypertension and eventual cardiovascular burden. Moreover, studies from the United States (U.S.) and Canada have shown that there is underuse of risk assessment scores by physicians or a lack of awareness regarding the defining point of high risk.[5]

As per the standard treatment guidelines on hypertension by Ministry of Health and Family Welfare Government of India, the overall cardiovascular risk can be estimated in absolute terms using different risk calculators such as the Framingham risk score, the systematic cerebrovascular and coronary risk evaluation (SCORE), and cardiovascular risk score QRESEARCH cardiovascular risk algorithm (QRISK2) score. In a study on patients presenting with a first myocardial infarction, it was seen that the international scoring systems like World Health Organization/International society of hypertension (WHO/ISH) CVD risk prediction charts, Framingham risk score, and the American college of cardiology/American heart association (ACC/AHA) calculator had insufficient accuracy in predicting cardiovascular risk in Indian patients.[6] Further, there are discrepancies between the different risk assessment tools. As shown in a study by Kanjilal et al on Asian Indians, the Framingham risk score (old version) was able to identify only 5% of the population at high risk, which appeared to be an underestimation of CVD risk in this genetically predisposed population.[7] According to The Joint British Societies recommendations on the prevention of CVDs (JBS3) risk calculator is another alternative used in British subjects, but unlike most other risk scores, it incorporates data on Indians and allows separate risk assessment for people with Indian ethnicity. The JBS3 risk calculator is a more comprehensive risk assessment tool and considers risk factors such as obesity and family history of premature CVD.[8,9]

It has been observed in studies that patients with a low 5/10-year risk may eventually be at a higher lifetime cardiovascular risk. Hence, calculating lifetime risk has become a predominant objective. As per a study in India, stroke incidence is 119-145 per 100,000 population with case fatality rate of 27-42%.[6] The international atherosclerosis society recommends that lifetime risk be assessed in all individuals aged 20-59 years who are free from CVD and are not at high short-term risk. Moreover, intensive lifestyle measures are recommended in all subjects who have moderately high or high lifetime cardiovascular risk. Various tools are useful for detection of subclinical atherosclerosis such as coronary calcium score (CCS), carotid ultrasound imaging, and aortic pulse wave velocity (PWV). Various clinical and biochemical markers like high-sensitive C-reactive protein (hsCRP), lipoprotein a [Lp (a)], apolipoproteins, inflammatory cytokines, and fibrinogen are used for prediction of cardiovascular risk.[8]

As per the ACC/AHA guidelines, initial first-line therapy for grade 1 hypertension includes thiazide diuretics, calcium channel blockers (CCBs), and angiotensin-converting-enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs). Beta-blockers are not the recommended first-line therapy except in coronary artery disease and heart failure with reduced ejection fraction. Moreover, spironolactone or eplerenone is preferred for the treatment of primary aldosteronism and in resistant hypertension.[10] Preferred drugs for treatment of patients with hypertension and various comorbidities include ACE inhibitors, with addition of CCBs/low-dose diuretics, if required, for diabetes and hypertension; ACE inhibitors, diuretics (including loop diuretics) and beta-blockers for heart failure and hypertension, beta-blockers, ACE inhibitors, or CCBs for coronary artery disease and hypertension. ARBs may be used in the place of ACE inhibitors in case there are side effects with ACE inhibitors like cough and angioedema. [6]

In recent years, management of hypertension in the presence of multiple comorbidities has made treatment regimens more complex with patient non-adherence and requirement of multiple drugs. Considering these implications, a cross-sectional survey was conducted to evaluate the awareness, usage, and applicability of cardiovascular risk assessment scores in the Indian setting.

METHODS

This study was a digital cross-sectional survey distributed to 400 consulting physicians and cardiologists, with at least 10 years of work experience, from different zones across the country. It was conducted within a span of 3 months between 15 July 2020 and 26 October 2020. Physicians who provided written informed consent received an online self-developed questionnaire with

standardized questions about awareness and timely usage of cardiovascular risk assessment scores and their applicability in Indian practice.

The survey questionnaire consisted of 29 items grouped in 3 sections which assessed the physicians' knowledge, attitude and practice trends about cardiovascular risk with respect to patient age, gender, hypertension prevalence, and comorbidities, and physicians' know-how and usage of cardiovascular risk calculators and FDCs.

The survey questionnaire broadly consisted of 3 sections on attitudes (section 1) and knowledge (section 2) of physicians with regard to cardiovascular risk assessment and real world data from physicians' clinical practice with regard to cardiovascular risk assessment (section 3). The detailed survey questionnaire is depicted in Table 1.

Statistical analysis

The responses procured were collated and documented, and statistical analyses were carried out using Microsoft excel. The total percentage of responses for each question was calculated.

RESULTS

A total of 400 physicians were approached for this survey, out of which 398 provided consent to participate. All 398 physicians responded to the survey, yielding a response rate of 99.5%.

Attitudes of physicians about CV risk

Tables 2 and 3 report the level of physician agreement and their attitudes on various parameters related to attitude of physicians with regard to CV risk assessment.

About 44% physicians mentioned that they perform CV risk calculation in hypertensive patients with 2 additional risk factors, while about 18% physicians estimate CV risk if hypertensive patients have more than 4 risk factors.

While expressing their views about calculating CV risk, 27% physicians reported that they came across multiple risk factors, 14% physicians had time constraints, about 4.6% physicians were uncertain that which was the ideal method for calculating the risk, and 3.6% physicians said that patient reluctance became a constraint in estimating CV risk. Furthermore, 50.8% physicians selected more than one of the above stated options as the reasons for constraint with regards to estimation of CV risk in routine clinical practice. As per 51.6% physicians, presence of multiple risk factors was the most important factor for CV risk, followed by 19.8/% who reported existing coronary heart disease (CHD), 16.8% who reported presence of family history of CHD, and 11.4% who considered smoking.

Practice patterns of physicians

Current clinical practices and physician preferences for CV risk estimation using different risk calculators are presented in Table 4. Besides, physicians were specifically asked to opine on the following case study to evaluate their knowledge of CV risk: a 42 year old male, nonsmoker has total cholesterol 273 mg/dl, low density lipoprotein (LDL) cholesterol 195 mg/dl, high density lipoprotein (HDL) cholesterol 52 mg/dl, triglycerides 132 mg/dl, blood pressure (BP) 118/78 mm Hg, BMI 24 kg/m^2, no relevant family history, and no history of diabetes. He is currently on no medications. What would be his 10-year CV risk category?

Majority of the physicians, i.e. 62.1% categorized this patient as having moderate risk, 19.8% considered him to be low risk, 14.4% considered him to be high risk, while only 3.6% considered him to be in the very high risk category.

Real-world data on physicians' practice

Table 5 summarizes physicians' responses to comorbidities, FDC usage, complications of hypertension and patient awareness based on daily clinical practice.

As observed in their clinical practice, more than half the physicians (56.0%) reported that 30-50% of their adult hypertensive patients have dyslipidemia, 58.0% reported that 30-50% hypertensive patients have ≥2 comorbidities, and 39.2% calculate CV risk in 30-50% hypertensive patients without comorbidities.

About 44.8% physicians reported that 30-50% of their hypertensive patients are aware and serious about preventing possible CV risks, while only 7.4% physicians reported that more than 70% of their patients are aware and serious about preventing CV risks.

Table 1: Survey questionnaire.

S. no.	Questions			
Section 1: attitude				
1	CV disease risk estimation plays an important role in therapy related decision-making process.			
	a) Strongly agree	b) Agree	c) Disagree	d) Strongly disagree
2	After calculating number of risk factors, CV risk can be generally estimated using clinical acumen and experience. However, using a validated calculator is more objective			
	a) Strongly agree	b) Agree	c) Disagree	d) Strongly disagree

Continued.

S. no.	Questions				
3	You will be more inclined in doing CV risk calculation in hypertensive patients with following number of additional CV risk factors?				
	a) 0- 1	b) 2	c) 3	d) ≥4	
4	I value the relevance of CV risk estimate, but I face following constraints in my routine clinical practice? (you can choose more than one option)				
	a) Time constraints	b) Multiple risk calculators	c) Uncertainty over ideal method	d) Patients' reluctance	
5	Easier and user-friendly methods to calculate CV risk will be motivating for the physicians to do CV risk estimation				
	a) Strongly agree	b) Agree	c) Disagree	d) Strongly disagree	
6	CV risk calculation is useful only in initial visit; indicate your level of agreement				
	a) Strongly agree	b) Agree	c) Disagree	d) Strongly disagree	
7	Routinely CV risk calculation in patients of Hypertension without comorbidities is useful; indicate your level of agreement				
	a) Strongly agree	b) Agree	c) Disagree	d) Strongly disagree	
8	Is age above 45 in male and age above 55 in female; an important risk factor in hypertension patient without other known co-morbidities?				
	a) Strongly agree	b) Agree	c) Disagree	d) Strongly disagree	
9	Most important CV risk factor in your opinion is?				
	a) Existing CHD	b) Multiple risk factors	c) Family history of premature CHD	d) Smoking	
Section 2: practice					
1	Which is your preferred option in estimation of CV risk?				
	a) Clinical judgement	b) Risk factor counting	c) Chart based	d) Online calculator	
2	If your answer is 'c' or 'd' in above question, then which is your preferred CV risk calculator?				
	a) Framingham risk score (FRS)	b) WHO International society of hypertension (ISH) charts	c) American College of Cardiology/American Heart Association (ACC/AHA)	d) Joint British Society (JBS III)	e) Other ….specify
3	In your clinical practice, in what percentage of hypertensive patients you do CV risk calculation?				
	a) >90%	b) 90%-60%	c) 59%-30%	d) <30%	
4	After initial calculation, how frequently do you follow up CV risk calculation in your hypertensive patients?				
	a) Every 6 months	b) Yearly	c) Occasionally	d) Rarely	
5	How often do you tell your patients regarding his/her CV risk estimate?				
	a) Always	b) Mostly	c) Occasionally	d) Never/rarely	
6	CV risk score can change from initial pre-treatment to post treatment after sufficient duration; indicate your level of agreement				
	a) Strongly agree	b) Agree	c) Disagree	d) Strongly disagree	
7	Which of the following hypertension guidelines you refer the most?				
	a) ACC	b) ESC	c) JNC 7	d) JNC 8	
8	What is your therapy of choice as 1st line in management of hypertension?				
	a) ACEi	b) ARBs	c) CCBs	d) Diuretics	
9	At what BP (mmHg) threshold would you start with a fixed-dose combination (FDC) containing two antihypertensives in treatment-naïve patients?				
	a) 130-139/80-89	b) 140-159/90-99	c) 160-179/100-109	d) >180/110	
10	A 42-year old male, non-smoker has total cholesterol 273 mg/dl, LDL cholesterol 195 mg/dl, HDL cholesterol 52 mg/dl, triglycerides 132 mg/dl, BP 118/78 mm Hg, BMI 24 kg/m^2, no relevant family history, and no history of diabetes. He is currently on no medications. What would be his 10-year CV risk category?				
	a) Low risk	b) Moderate risk	c) High risk	d) Very high risk	
Section 3: real world data					
1	What percent of adults in your clinical practice have hypertension (with/without dyslipidemia)?				
	a) <30%	b) 30%-50%	c) 50%-70%	d) >70%	
2	What percent of adults in your clinical practice have hypertension with dyslipidemia?				
	a) <30%	b) 30%-50%	c) 50%-70%	d) >70%	
3	What percent of hypertensive patients have ≥2 comorbidities?				

Continued.

S. no.	Questions			
	a) <30%	b) 30%-50%	c) 50%-70%	d) >70%
4	What percent of your hypertensive patients have well controlled blood pressure?			
	a) <30%	b) 30%-50%	c) 50%-70%	d) >70%
5	What percent of your patients are on antihypertensive FDC containing two active ingredients?			
	a) <30%	b) 30%-50%	c) 50%-70%	d) >70%
6	In what percent of hypertensive patients without comorbidities, you calculate CV risk?			
	a) <30%	b) 30%-50%	c) 50%-70%	d) >70%
7	What percent of your patients develop resistant hypertension?			
	a) <30%	b) 30%-50%	c) 50%-70%	d) >70%
8	What percent of hypertensive patients develop heart failure in your clinical practice?			
	a) <30%	b) 30%-50%	c) 50%-70%	d) >70%
9	What percent of hypertensive patients suffer stroke in your clinical practice?			
	a) <30%	b) 30%-50%	c) 50%-70%	d) >70%
10	How many hypertensive patients in your practice are aware and serious about preventing possible CV risks?			
	a) <30%	b) 30%-50%	c) 50%-70%	d) >70%

Table 2: Level of physician agreement on various parameters related to attitudes about CV risk.

Parameter	Percentage of physicians			
	Strongly agree	**Agree**	**Disagree**	**Strongly disagree**
CV disease risk estimation plays an important role in therapy related decision-making process	71.0	28.0	0	0
After calculating number of risk factors, CV risk can be generally estimated using clinical acumen and experience. However, using a validated calculator is more objective	48.0	50.0	1.0	1.0
Easier and user-friendly methods to calculate CV risk will be motivating for the physicians to do CV risk estimation	54.7	44.0	0.5	0.5
CV risk calculation is useful only in initial visit; indicate your level of agreement	19.1	55.7	22.7	2.3
Routinely CV risk calculation in patients of hypertension without comorbidities is useful; indicate your level of agreement.	26.2	64.4	8.4	0.8
Is age above 45 in male and age above 55 in female; an important risk factor in hypertension patient without other known co-morbidities?	35.4	57.5	6.4	0.5

Table 3: Attitude of physicians for CV risk estimation.

Parameter (%)	% Physicians				
You will be more inclined in doing CV risk calculation in hypertensive patients with following number of additional CV risk factors?	0- 1	2	3	≥4	-
	10.7	43.8	27.7	17.6	
I value the relevance of CV risk estimate, but I face following constrains in my routine clinical practice? (you can choose more than one option)	Time constraints	Multiple risk calculators	Uncertainty over ideal method	Patients' reluctance	Multiple factors
	14.0	27.0	4.6	3.6	50.8
Most important CV risk factor in your opinion is?	Existing CHD	Multiple risk factors	Family history of premature CHD	Smoking	-
	19.8	51.6	16.8	11.4	

CV: cardiovascular; CHD: coronary heart disease

Table 4: Physicians' clinical practice and preference of calculators for estimating CV risk.

Parameter	% Physicians			
	a	b	c	d
Which is your preferred option in estimation of CV risk?	Clinical judgement	Risk factor counting	Chart based	Online calculator
	28.1	27.6	18.3	26.0
If your answer is 'c' or 'd' in above question, then which is your preferred CV risk calculator?	FRS	WHO-ISH charts	ACC/AHA calculator	JBS III
	32.7	13.7	51.6	2.1
In your clinical practice, in what percentage of hypertensive patients do you do CV risk calculation?	>90%	90%-60%	59%-30%	<30%
	7.7	37.4	39.2	15.7
After initial calculation, how frequently do you follow up CV risk calculation in your hypertensive patients?	Every 6 months	Yearly	Occasionally	Rarely
	53.9	22.4	20.9	2.8
How often do you tell your patients regarding his/her CV risk estimate?	Always	Mostly	Occasionally	Never/rarely
	29.4	54.4	15.2	1.0
CV risk score can change from initial pre-treatment to post treatment after sufficient duration	Strongly agree	Agree	Disagree	Strongly disagree
	28.6	69.6	1.3	0.5
Which of the following hypertension guidelines you refer the most?	ACC	ESC	JNC7	JNC8
	22.9	11.6	16.2	49.2
What is your therapy of choice as 1st line in management of hypertension?	ACEi	ARBs	CCBs	Diuretics
	5.9	77.6	11.9	4.6
At what BP (mmHg) threshold would you start with a FDC containing two antihypertensive in treatment-naïve patients?	130-139/80-89	140-159/90-99	160-179/100-109	>180/110
	10.3	47.4	40.7	1.3

ACC/AHA: American College of Cardiology/American Heart Association; ACEi: angiotensin-converting enzyme inhibitor; ARBs: angiotensin-receptor blockers; BP: blood pressure; CCBs: calcium channel blockers; CV: cardiovascular; ESC: European Society of Cardiology; FDC: fixed-dose combination; FRS: Framingham risk score; JBS: Joint British Society; JNC: Joint National Committee; WHO-ISH: World Health Organization – International Society of Hypertension

Table 5: Real-world data from clinical practice on comorbidities, FDC usage, complications of hypertension; and patient awareness.

Parameter	% Physicians			
	<30% patients	30%-50% patients	50%-70% patients	>70% patients
What percent of adults in your clinical practice have hypertension (with/without dyslipidemia)?	17.6	51.1	23.9	7.4
What percent of adults in your clinical practice have hypertension with dyslipidemia?	16.0	56.0	23.7	4.3
What percent of hypertensive patients have ≥2 comorbidities?	14.0	58.0	24.4	3.6
What percent of your hypertensive patients have well controlled blood pressure?	13.5	33.3	30.8	22.4
What percent of your patients are on anti-hypertensive FDC containing two active ingredients?	5.1	46.6	39.9	8.4
In what percent of hypertensive patients without comorbidities, you calculate CV risk?	36.6	39.2	18.6	5.6
What percent of your patients develop resistant hypertension?	71.8	20.9	6.4	1.0
What percent of hypertensive patients develop heart failure in your clinical practice?	63.1	26.0	9.2	1.8
What percent of hypertensive patients suffer stroke in your clinical practice?	63.9	27.5	7.9	0.8

Continued.

Parameter	% Physicians			
	<30% patients	30%-50% patients	50%-70% patients	>70% patients
How many hypertensive patients in your practice are aware and serious about preventing possible CV risks?	28.2	44.8	19.6	7.4

CV: cardiovascular; FDC: fixed-dose combination

DISCUSSION

Clinical evidence reiterates that systemic hypertension is the leading cause of CVD risk, which is further aggravated by the presence of comorbidities.[2,6] Patients with lower cardiovascular risk eventually proceed towards a higher lifetime cardiovascular risk, which makes it essential to measure cardiovascular risk at an earlier stage.[6] It has also been observed by the Scottish intercollegiate guideline network (SIGN) that majority of CVD cases are experienced by individuals who are at lower levels of absolute risks.[11] Hence, it is necessary to identify individuals using scoring systems to estimate absolute risk. Further, multiple comorbidities make the management of hypertension complex and complicated with polypharmacotherapy.[12] In this regard, our survey analyzed current knowledge, clinical acumen, and real-world data of Indian physicians to understand and appreciate the usage of cardiovascular risk calculators.

In a meta-analysis of randomized trials in patients assigned to blood pressure-lowering drugs or placebo, it was observed that blood pressure-lowering treatment reduced the risk of cardiovascular events in those with 5-year risk. Also, it was suggested that blood pressure-lowering treatment should target those at greatest cardiovascular risk, not just those with the highest blood pressure levels.[13] This observation was also evident from our study wherein majority of the physicians strongly agreed that CV disease risk estimation plays an important role in therapy related decision-making process. Moreover, our study revealed that only 7.7% physicians calculate CV risk in >90% of their hypertensive patients. This shows that there is poor adherence among Indian physicians to risk estimation and that there exists a need for enhancing awareness about early CV risk estimation. Similar result was observed in a survey conducted in the USA where only 17% physicians usually or always used a CHD risk calculator.[14] In another survey from Germany, 70% of the 26 general practitioners surveyed did not use risk calculators.[15] In a survey by the European society of cardiology (ESC) in six European countries, 62% of physicians opted for subjective methods to measure risk instead of guidelines or risk calculators.[16] This shows that consistent with our survey, majority of physicians rely on clinical acumen for treatment rather than estimating CV risk.

The availability of multiple risk calculators is also viewed as a major constraint by the physicians since they find it difficult to choose the most appropriate calculator for their patient population. This is supported by some studies in which risk estimates vary between different calculators. Lack of time and patient compliance were other factors that the clinicians reported in our survey, which were also reported in the survey conducted in six European countries by the ESC.[17] Physicians also reported uncertainty over the ideal method for CV risk estimate. As observed in our study, majority of the physicians selected multiple responses as constraints in their clinical practice. This indicates that a combination of various parameters such as time, patient reluctance, choice of calculator, and uncertainty over ideal method for risk calculation influence physicians' choices; hence, they rely on counting the number of risk factors, individual clinical expertise, and their patient experience. Considering these factors, physicians in our survey agreed that using a validated calculator is more objective in estimation of CV risk.

Although the JBS risk calculator considers BMI, family history of CVD, history of atrial fibrillation and chronic kidney disease (CKD), in addition to other CV risk parameters considered in FRS, ACC/AHA and World Health Organization (WHO) risk scores; our study found that majority of physicians use ACC/AHA calculator and only 2.1% follow the JBS III calculator.[8] This suggests the need for better understanding about advantages and disadvantages of all the available risk assessment tools and identifying the ones most relevant based on patient profiles.

FDCs are preferred due to complementary mechanism of action, synergistic effects, better tolerability, elongated product life-cycle management, and cost savings.[11] As per our study, about 51.5% physicians stated that they follow the JNC8 guideline for hypertension. Moreover, majority of physicians start with a FDC containing two antihypertensive agents in treatment naïve patients at BP threshold of 160-179/100-109. This therapy related decision-making falls in line with the earlier studies on FDCs and recommendation of JNC8 guideline.[11,18]

Assessing the real-world data in this study, it was observed that more than half of the physicians in our survey come across 30-50% of their hypertensive patients with dyslipidemia. This result falls in line with other study from India, where dyslipidemia was found to be a common comorbidity in patients with hypertension.[19] There are several risk factors commonly present in hypertensive patients, but they often remain asymptomatic.[20] In accordance with this, it was observed in our survey that majority of physicians tend to calculate CV risk in only 30%-50% of their hypertensive patients without comorbidities. This highlights the fact that a vast majority of the patient population may remain undetected of their CV risk, which adds to the burden of CV mortality, and hence timely assessment is crucial for hypertension and CV risk reduction.

From our study it was also observed that only 7.4% of physicians reported that >70% of their patients knew about and were serious about preventing possible CV risks. As per another Dutch qualitative study on use of risk assessment for primary prevention suggested that physicians' ability to communicate about this knowledge of risk assessment to the patients influences its implementation, and there may be limited understanding among the patients on how risk is related to disease progression and how to use the risk tables.[21,22] This highlights the probable doctor-patient communication barrier, which needs to be addressed for better patient adherence to treatment and to avoid serious life-threatening outcomes.

This survey provided a unique approach to identify and gauge the physicians' practice habits towards CV disease awareness and prevention. It evaluated for the first time in India, the awareness and perspectives of physicians towards usage and implication of CV risk calculators in their practice. This is a preliminary effort to understand the clinical practice preferences, and the observations obtained can be further validated in a larger setup.

However, the survey does not capture the variability factor due to geographic locations, generic differences, and other baseline parameters like age, gender, and comorbidities of the patients that the physicians may have considered while responding to the survey questions. The total patient percentile based on which each physician provided their responses was also not accounted.

CONCLUSION

In current scenario of high prevalence of hypertension and multiple comorbidities in the population, all therapy related decisions need to be based on evidence and CV risk estimation is a cornerstone to guide the treatment for primary prevention of future CV events. Although it is perceived to be tedious process given the various available tools that require a thorough understanding and the various barriers in clinical practice, our survey shows the inclination of medical fraternity towards having access to a comprehensive CV risk assessment tool for the Indian population. This will lead to a better understanding of ways to prevent the CV risk and timely control of hypertension to avert subsequent fatal events by using FDCs.

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