

Research Article

Prevalence and distribution of hypertension among the patients presenting for surgery under anaesthesia in a tertiary care hospital in South India

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ABSTRACT

Background: Untreated perioperative hypertension can have deleterious effect on patient outcome following surgery. Therefore, many anaesthesiologists prefer to have elective surgeries deferred till the blood pressure is under control. This results in delay and inconvenience to the patient. We designed this study to determine the magnitude of this problem.

Methods: The pre-anaesthesia records of 400 consecutive patients who underwent surgery under general or regional anaesthesia were reviewed. They were grouped into known hypertensive, newly detected hypertensive in the present visit or normal.

Results: 6.4% of patients in the above 40 year age group, who are the population at risk for developing hypertension, had newly detected hypertension. Higher percentage of women than men in this age group were hypertensive though not statistically significant. The prevalence of hypertension (the sum of known hypertensive and newly detected hypertensive patients) was 9.25% in our study. In the above 40 age group this figure was 18.8%. Significantly higher numbers of women were hypertensive as compared to men (23.4% vs 11.6%) in this age group.

Conclusions: Our findings show that the number of newly detected hypertensive patients in the surgical population is low and hence this does not pose a significant problem. The percentage of newly detected hypertension and the prevalence of hypertension in the present study are lower than that reported in the general population from other parts of India. This warrants further studies in our geographical area to determine if similar trend exists in the general population too.

Keywords: Hypertension, Prevalence, Anaesthesia, Surgery, South India

INTRODUCTION

During perioperative period there are important events which cause escalation in blood pressure like tracheal intubation, surgical incision, emergence from anaesthesia and post-operative pain.¹ This rise in blood pressure is exaggerated in patients who have preoperative untreated

hypertension.² In a study on the contribution of hypertension to death due to cardiovascular complications within 30 days of anaesthesia and surgery, preoperative hypertension was found to be four times likely than matched controls.³ So detecting and treating these patients is of paramount importance due to the high degree of morbidity and mortality these patients carry.

Even among those patients where such catastrophic events do not develop, the incidence of silent ischemic changes in the ECG is relatively common when they have untreated hypertension.⁴

However, enthusiastic attempts at bringing down the blood pressure will result in delay in surgery and jeopardise the organ perfusion in susceptible patients.⁵ So despite these potential dangers, the present recommendation for a patient with high blood pressure is to go ahead with the surgery unless the blood pressure is more than systolic 180 or diastolic 110 mmHg.^{6,7}

Nevertheless, many anaesthesiologists, especially those from non-Western countries, prefer to have the blood pressure under control before they proceed with the surgery. This is because most of the studies with a liberal approach to hypertension before surgery are from Western set ups where the perioperative monitoring to detect any untoward events related to hypertension is optimum and the promptness of response to any eventuality is exemplary. These standards cannot always be ensured in third world countries. In this scenario, many anaesthesiologists hesitate to proceed with an elective surgery when hypertension is detected. The delay endured is generally about 2 weeks which is the average time for the blood pressure to normalise with the use of oral antihypertensive. If the deleterious effect of high blood pressure on endothelial damage is to be reversed, 6-8 weeks of therapy is needed.⁵ This delay and the subsequent inconvenience caused to the patient could have been avoided if the patient was already on treatment and the blood pressure was under control. Our study was aimed at quantifying the percentage of patients with undetected hypertension during preoperative check-up for whom the surgery would be delayed.

METHODS

With the approval of the institute ethical committee, the data was collected retrospectively from 400 consecutive patients older than 18 years who had undergone surgery under general or regional anaesthesia in Indira Gandhi Medical College and Research Institute, a tertiary care government hospital in Puducherry, South India. Both elective and emergency surgeries were included. The patients who underwent surgery under local anaesthesia were excluded from the study. The data was compiled by going through the pre-anaesthetic chart and hospital records. A patient was considered to have hypertension if the systolic blood pressure was more than 140 mm Hg or diastolic blood pressure was more than 90 mmHg or if he/she was on treatment for hypertension at the time of preoperative anaesthesia check-up. If the patient had already been diagnosed as having hypertension prior to the present surgery, this will be noted and they would be assigned to Group OH (Old Hypertension). If they were diagnosed for the first time during perioperative evaluation for the present surgery, they were included in Group NH (New Hypertension). If they did not have

hypertension, they were grouped under Group N (Normal). Though there are previous reports about the prevalence of hypertension in the general population, there is no study on the same among surgical patients. So, an assumed prevalence of 50% with 5% absolute precision was used for calculating the sample size and it came out to be 400. The data was analysed using EpiData Analysis v.2.2.2. To find the association between variables like age, gender and presence of hypertension, Chi-square test was used. Fisher's exact test was used when Chi-square was not applicable. A 'p' value less than 0.05 was considered statistically significant.

RESULTS

The patients included in the study were those operated by departments of general surgery, obstetrics & gynaecology, orthopaedics and ENT. The total number of patients studied was 400. Out of these, 125 (31.2% of total) were males and 275 (68.8%) were females. The number of elective surgeries was 358 and emergencies were 42. The mean age of the study population was 38.9 years with a standard deviation of 14.25. Since, the patients above 40 years are at greater risk for developing hypertension, the subjects were grouped as below 40 years and above 40 years. The distribution of these cases according to age and gender is given in Table 1.

Table 1: Age and gender distribution of study population.

Total Number of patients 400	<40 years		>40 years	
	M	F	M	F
	65	181	60	94
	Total 246 (61.5%)		Total 154 (38.5%)	

Out of 400 patients, 5.5% were found to have had hypertension prior to the admission for the present surgery. Their distribution is mentioned in Table 2. Fifteen patients (3.75% of the total) were newly detected to have hypertension. Their distribution is given in Table 3.

Table 2: Age and gender distribution of known hypertensive.

Known Hypertensive Total 22(5.5%)	<40 years		>40 years	
	M	F	M	F
	2 (3.0%)	1 (0.55%)	5 (8.3%)	14 (14.8%)
	Total 3 (1.2%)		Total 19 (12.3%)	

Among women, significantly higher number above 40 years was hypertensive compared to those below 40 years (p value 0.002). In the above 40 age group, more women were found to have newly detected hypertension when compared to men (8.5% vs 3.3%). But this was not statistically significant. However, in the below 40 age

group, significantly more men were found to have newly detected hypertension compared to women (p value 0.001).

Table 3: Age and gender distribution of newly detected hypertensive.

Newly detected Hypertensive Total 15 (3.75%)	<40 years		>40 years	
	M	F	M	F
	4	1	2	8
	(6.1%)	(0.55%)	(3.3%)	(8.5%)
	Total 5 (2%)		Total 10 (6.49%)	

Prevalence of hypertension in the study population is the sum of the numbers of already hypertensive and newly detected cases. These values are given in Table 4.

Table 4: Age and gender distribution of total number of hypertensive patients in the study.

Total number of hypertensive patients = 37 (9.25%)	<40 years		>40 years	
	M	F	M	F
	6	2	7(11.6%)	22(23.4%)
	Total 8 (3.2%)		Total 29 (18.8%)	

Women more than 40 years were found to have 18.6 times higher relative risk for developing hypertension compared to women less than 40 years. This difference was statistically significant with p value <0.001. Also women above 40 years had 2.13 times higher relative risk of developing hypertension compared to men of similar age (p value 0.04). Among those less than 40 years there were significantly more men than women who were hypertensive (p value <0.01).

DISCUSSION

The most common avoidable reason for postponement of surgery is hypertension.⁸ Prevalence of hypertension is about 28% in the north American and 44% in European population.⁹ Among Indians it is 28-32% among urban and 27.6% in rural population.¹⁰ In India, many apparently healthy individuals have undetected hypertension. This could be due to the poor awareness of the seriousness of the disease or lack of facilities to detect and treat it. In a study conducted among apparently healthy individuals from Western part of India, it was found that 11% of those under 40 years had hypertension.¹¹ The figure goes up to 26% in those who are more than 40 years.¹¹ Similar data is not available for South Indian population. Patients above 40 years are the at-risk population because systolic, diastolic and mean arterial blood pressures increase linearly as the age increases from 30 to 80.¹²

Our attempt was to quantify the percentage of patients for whom the surgery would be delayed owing to undetected hypertension during preoperative check-up. The percentage of newly detected hypertensive patients was

2% in patients less than 40 years and 6.4% in those above 40 years in our study (Table 2). If these patients had been diagnosed and treated earlier (prior to them developing the problem leading to the surgery), the delay in surgery could have been avoided. However, since the number of patients in this category is far low, we can conclude that undetected hypertension during pre-anaesthetic check-up is not a serious problem with regard to delay in surgery. Further studies are needed before we can extrapolate this finding to the general population.

The percentage of newly detected hypertension of 2% in less than 40 years and 6.4% in above 40 years in our study is far lower than that reported in apparently healthy individuals from Western part of India.¹¹ One possible reason for this low rate can be due to the fact that a patient with any systemic disease has a higher likelihood of being detected earlier with hypertension. For example, a patient with diabetes is more likely to get frequent medical examinations and if hypertension is present it is more likely to be picked up in this patient. The above mentioned study did not include these patients which might explain the difference in findings.

Nevertheless, we believe our finding is curious enough to initiate a study among the general population to see if the detection rate for new hypertension is indeed as low as that seen in our surgical population. It would also be interesting to know the distribution of hypertension among surgical population in other parts of the country and the world.

The prevalence of hypertension in our study group is the sum of known hypertensive and newly detected hypertensive patients. This was also found to be less compared to that in the general population. In south India, the prevalence of hypertension is 21% in rural population and 31.8% in urban population.¹⁰ Despite our hospital being located in an urban town, only 9.25 % of the study population were found to be hypertensive (Table 4). This low number can be partially explained by the fact that the patients who come to our hospital largely belongs to the lower socioeconomic class. So they may not represent the typical urban population. In patients who were older than 40 years who are the population at risk for hypertension, we found that the prevalence was 18.8%. This is close to the figure reported from rural population in South India.¹⁰ The finding that the prevalence is low in less than 40 year group seems to suggest that the younger population here is healthier than in other parts of South India. However a study on the general population of Puducherry is necessary before we can conclude this.

We also found that more women as compared to men (23.4% vs 11.6%) were hypertensive in the above 40 years age group (Table 4). Women who were older than 40 years had 18.6 times higher relative risk of being hypertensive compared to women less than 40 years. Both these results were statistically significant. This

finding is in line with already known data that postmenopausal women are more likely to have hypertension than men of similar age.^{13,14} The effect of hypertension is also more serious in these women than in men. They have more pronounced concentric ventricular remodelling and less dilation in response to hypertension.¹⁵ Therefore they are more likely to develop cardiac failure.¹⁵ Whether this translates to greater perioperative risk among women needs to be studied.

CONCLUSION

We found the number of newly detected hypertension in the patient population who underwent surgery under anaesthesia to be lower than that reported from a previous study among the general population in Western India. So the percentage of patients whose surgeries have to be postponed due to newly detected hypertension is not as significant as expected. To know if this low detection rate is because of the better awareness about hypertension and its earlier detection, we need to conduct a similar study in our State among the general population. We also found that the prevalence of hypertension in surgical patients to be lower than that reported from general population in other parts of India. Further studies on the general population of Puducherry are needed to throw more light on the burden of hypertension here.

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