

Is Pre-Operative Acute Rise in Blood Pressure before Eye and ENT Surgery A Genuine Excuse for Postponement of the Procedures?

Rise in Blood Pressure before Surgery for Postponement

Mohammad Mohsin Rana¹, Sajid Rashid Nagra², Zafar Latif Awan³, Danish Gani⁴, Zafar Iqbal Zafar⁴ and Khawaja Ishfaq Ahmed¹

ABSTRACT

Objective: This study was carried out to alleviate the unnecessary taboos attached to it by studying the incidence and outcome of this unexpected finding.

Study Design: Observational cross section study

Place and Duration of Study: This study was conducted at the Rai Medical College Teaching Hospital (RMCTH), Sargodha from Jan –June, 2022.

Materials and Methods: All subjects between 20-90 years of age of both sexes, presenting for pre-operative assessment before any planned Eye and ENT surgery were assessed by measuring their BP. If it was found to be above 140/90 mmHg, they were included in this study. Consenting patients were referred to the physician for proper assessment and management prior to surgery.

Results: During the study period 288 surgeries were planned by Eye (67%, n192) and ENT (33%, n96) department. 25% (n72) were found to have their BP above 140/90 mmHg. Only these patients were referred to physicians for review and management and enrolled in the study. 42% were known hypertensives. Out of these 38% missed the morning dose of their antihypertensive medicine. The other 58%, both known hypertensives and previously normotensive had clear cut evidence of anxiety manifesting as palpitation, tremors and cold sweaty palms.

Conclusion: The available literature doesn't support the common notion that pre-existing hypertension or pre-operative hypertension are associated with peri-operative hemodynamic instability or a poor surgical outcome. One must appreciate the difference between the increased chances of having complications in hypertension but the actual degree of being above the normal BP have no association with increased risk of complications. It can be concluded from this study It is perfectly safe to proceed with surgery till pre-operative BP is below 180/110 mmHg. Any such decision must be weighed against urgency and potential risk for postponement on individual basis with special emphasis in diabetics, CHD and renal disease.

Key Words: Hypertension, Pre-operative Hypertension, Eye and ENT surgery

Citation of article: Rana MM, Nagra SR, Awan ZL, Gani D, Zafar ZI, Ahmed KI. Is Pre-Operative Acute Rise in Blood Pressure before Eye and ENT Surgery A Genuine Excuse for Postponement of the Procedures? Med Forum 2022;33(11):93-97.

INTRODUCTION

Normal vitals especially BP is a pre-requisite for surgery and anesthesia fitness. Many a time a person is found to have raised BP for the first time at the time of pre-assessment for fitness without any documented history of hypertension (HTN) or a well-controlled hypertensive patient on medication is found to have a

high BP at this assessment. This becomes a reason for postponement of the surgical procedure in planned cases. In the light of available literature this is purely an over-reaction¹. The global incidence of HTN is around 30% with wide variations mainly in different age groups, ethnicity and clustering of factors of metabolic syndrome.

The available literature doesn't support the common notion that pre-existing hypertension or pre-operative hypertension are associated with peri-operative hemodynamic instability or a poor surgical outcome. The joint guidelines from AAGBI and the British Hypertension Society states that it is perfectly safe to proceed with surgery till pre-operative BP is below 180/110 mmHg.¹

Every preoperative assessment shall be taken as a screening unique opportunity for common diseases according to the age, gender, genetic lineage and geography. According to American Heart Association

¹. Department of Medicine / ENT² / Community Medicine³ / Ophthalmology⁴. Rai Medical College, Sargodha.

Correspondence: Dr. Mohammad Mohsin Rana. Associate Professor of Medicine. Rai Medical College, Sargodha.
Contact No: 03009669108, 03427736580
Email: drmohsinrana2905@gmail.com

Received: July, 2022
Accepted: August, 2022
Printed: November, 2022

(AHA) guidelines, for patients with mild to moderate hypertension, alternatively defined as Stage 1 and Stage 2 respectively (below 180/110 mmHg) there is no increased risk for peri-operative adverse outcomes. However BP shall be brought within acceptable range (140/90 mmHg) before proceeding for surgery in patients presenting with severe HTN or Stage 3 HTN (\geq 180/ 110 mmHg). For diabetic and renal patients recommended targets are $<$ 130/85 mmHg and $<$ 125/75 mmHg. For patients 80 years and above the targets shall be a little bit relaxed, around 150/80 mmHg.^{2,3}

This study was carried out to alleviate the unnecessary taboos attached to it by studying the incidence and outcome of this unexpected preoperative high BP and to highlight that joint guidelines from the AAGBI and the British Hypertension Society states that it is perfectly safe to proceed with surgery till pre-operative BP is below 180/110 mmHg. Special care is recommended for only diabetics, Ischemic Heart disease and renal patients.

MATERIALS AND METHODS

Patients having BP above 140/90 mmHg, between 20-90 years of age of both gender, presenting for pre-operative assessment before any eye and ENT surgery were included in this study. Consenting patients were referred to the physician for proper assessment. Their BP was reassessed as per standard practices. Physicians reviewed the fitness for surgery.

Inclusion Criteria: 20-90 years age, both sexes, presenting for eye and ENT surgery.

Exclusion Criteria: Seriously sick patient or terminally ill patient.

Secondary Hypertension and pregnancy
Major end organ disease, liver, kidney, heart, lungs
Hypertensive urgency and emergency

Sample size and sampling technique: A minimum sample size of 196 patients was calculated to maintain a 5 percent margin of error, a 95 percent confidence

interval and a 75 percent response distribution, using a raosoft sample size calculator.

RESULTS

During the study period 288 surgeries were planned by Eye [(67%) (n 192)] and ENT [(33%) (n 96)] Departments. 25% (n 72) were found to have their BP above 140/90 mmHg which raised alarm bells for the anesthesia team. These were referred to physicians for review and management. Only these 72 patients were enrolled in the study. Out of these 42% (n 30) were known hypertensives.

4 (5.56%) patients were below 40 years and 6 (8.33%) patients were above 80 years, there were 31 (43%) patients in both 40 to 60 and 60 to 80 years age group.

Out of 72 patients 30 (42%) were known hypertensive and were well controlled, otherwise these wouldn't have been given appointment for surgery. 1 (3.33%) patient was below 40 years and 2 (6.67%) patients were above 80 years, majority 17 (56.67%) were between 40 to 60 years and 2 (6.67%) were between 60 to 80 years age group. All these previously well controlled hypertensives had their BP above 140/90 mmHg unexpectedly on the morning of surgery.

Out of these known hypertensives, 11 (37%) missed the morning dose of their antihypertensive medicine as they were asked to come in fasting state or as per common belief that fasting is mandatory for each surgery. The other 58%, both known hypertensives and previously normotensive had clear cut evidence of anxiety manifesting as palpitation, tremors and cold sweaty palms. HTN is most prevalent in 40s through 70s, so is the distribution in our study, 86% (N 62) were in 40-80 years age group.

Statistical Analysis: Data analysis was conducted using Microsoft Excel version 2016 and Statistical Package for Social Sciences software version 25 (SPSS 25). Descriptive statistics (i.e. frequency distribution, percentages, mean and standard deviations) were used.

Table No.1: Demographic features. n 72

Age	EYE (MALES)	EYE (FEMALES)	ENT (MALES)	ENT (FEMALES)
< 40	n3 (2.16%)	n0	n0	n1 (1.39%)
40-60	n13 (18.05%)	n10 (13.89%)	n5 (6.94%)	n3 (2.16%)
60-80	n16 (22.22%)	n10 (13.89%)	n3 (2.16%)	n2 (2.78%)
>80	n4 (5.56%)	n0	n2 (2.78%)	n0

Table No. 2: Known hypertensive. 42% (n30)

	EYE (MALES)	EYE (FEMALES)	ENT (MALES)	ENT (FEMALES)
< 40	n0	n0	n0	n1 (3.33%)
40-60	n8 (26.67%)	n5 (16.67%)	n3 (10%)	n1 (3.33%)
60-80	n5 (16.67%)	n4 (13.33%)	n1 (3.33%)	n0
>80	n2 (6.67%)	n0	n0	n0

Table No. 3: Preoperative BP, normotensive and hypertensives. n 72

	EYE (MALES)	EYE (FEMALES)	ENT (MALES)	ENT (FEMALES)
< 40	n3 (2.16%) 165-170/95-100 Mean,166.7/96.7 Median, 165/95 Mode,165/95 SD, 2.89	n0	n0	n1 (1.39%) 165/100
40-60	n13 (18.05%) 150-195/80-105 Mean,175/94 Median,175/100 Mode,180/100 SD,13.9/8.9	n10 (13.89%) 155-210/95-115 Mean,179.5/99.5 Median,180/100 Mode,170/100 SD,18.5/5.9	n5 (16.67%) 155-170/85-95 Mean,160/88 Median,155/85 Mode, 155/85 SD, 7/4.5	n3 (2.16%) 155-170/90-100 Mean, 163/92 Median, 165/90 Mode, 165/90 SD, 7.6/5.8
60-80	n16 (22.22%) 175-195/95-105 Mean, 180/99 Median, 180/100 Mode, 190/100 SD, 10/3.4	n10 (13.89%) 165-190/95-105 Mean, 179/99 Median, 180/100 Mode, 190/100 SD, 10.3/3.4	n3 (2.16%) 165-185/85-100 Mean, 172/90 Median, 165/85 Mode, 165/85 SD, 11.5/8.7	n2 (2.78%) 190/100 Mean, 190/100 Median, 190/100 Mode, 190/100 SD, 0/0
>80	n4 (5.56%) 180-190/95-100 Mean, 188/99 Median, 190/100 Mode, 190/100 SD, 5/2.5	n0	n2 (2.78%) 180/105 Mean, 180/105 Median, 180/105 Mode, 180/105 SD, 0/0	n0

DISCUSSION

Perioperative HTN increases the chances of postoperative increase in CV events like ischemia or dysrhythmias, cerebrovascular events, bleeding, and overall mortality. BP over 180/110 mmHg is arbitrarily taken as a cut off limit to postpone elective surgery in the absence of universally accepted guidelines. (4) This notion is fueled by the fact that both HTN and DM are the commonest underlying comorbidities in senior years.⁵

NICE first issued guidance for the management of hypertension in primary care in 2004. This was followed by a rapid update in 2006, 2011 and 2019 in the chapter for pharmacological treatment.^{6,7}

As discussed above AHA guidelines clearly mentions that in Stage 1 and Stage 2 HTN, it is perfectly safe to proceed with surgery as the risk of peri-operative adverse outcomes is same. However in Stage 3 HTN or in patients with diabetes and renal disease patients recommended targets of <130/85 mmHg and <125/75 mmHg shall be achieved by pharmacotherapy before proceeding for surgery. Similarly in patients 80 years and above relatively relaxed targets around 150/80 mmHg shall be ensured pre-operatively.^{2,3}

During the study period 288 surgeries were planned and every fourth (BP above 140/90) patient was referred for reevaluation to the physicians due to the concerns by anesthetist. This group comprised of both previously

normotensive and known hypertensives (42%). Out of these 37% (n11) missed the morning dose of their antihypertensive medicine as they were asked to come in fasting state or as per common belief that fasting is mandatory for each surgery. The other 58%, both known hypertensives and previously normotensive had clear cut evidence of anxiety manifesting as palpitation, tremors and cold sweaty palms.

Blood pressure variability (BPV) is a newly developing concept to stress upon the dynamic fluctuations in cardiovascular (CV) regulation under varying environmental (seasons, altitude, stress), physical (posture or volume), and emotional factors as part of BP homeostasis. Evidence is fast emerging to suggest its predictive and prognostic role as a CV risk stratification in addition to average BP levels.⁸ Twenty four hour BP monitoring can gauge the target organ damage at subclinical level and can better predict the CV risk than the spot office measurement.⁹ Though central BP is better reflection of carotid intima-media thickness and left ventricular mass and hence is taken as a better marker of future CV events than peripheral BP, being invasive it can't be used in day-today clinical practice. It can be measured indirectly and non-invasively by tonometry using arterial flattening to get an almost identical pulse waves when applied to radial, carotid or femoral artery.¹⁰

BP can be measured by using the reference method of arterial catheterization or non-invasively by intermittent

oscillometry and by continuous finger cuff methods recording. The reference method is limited being technically challenging and having potential complications such as permanent ischemic damage, bleeding and infection. Accuracy of non-invasive intermittent inflatable cuff oscillometry is dependent on appropriate cuff size and cuff positioning. Finger cuff-based also referred to as the volume clamp method is new promising technology having better agreement with intra-arterial measurements than oscillometry.¹¹

Cataract surgery is associated with non-ocular peri-operative complications in 2-15% of cases, 90% cases accounted for by labile BP, dysrhythmias and bronchospasm depending upon age and pre-existing disease. Known hypertensives with or without proper preoperative good control and with or without other comorbidities, are always more problematic during peri-operative period. One must appreciate the difference between the increased chances of having complications in hypertensive but the actual degree of being above the normal BP have no association with increased risk of complications. It implies that the actual per-operative readings in stage 1 and 2 range does not increase the chances of adverse events and shall not be a reason for concern or postponement of surgery. Any such decision must be weighed against urgency and potential risk for postponement on individual basis. These patients are definitely at increased risk, though small, of dysrhythmias and even silent myocardial ischemia.¹²

It is established that in non-cardiac surgeries very tight prei-operative blood pressure control doesn't significantly affect the surgical outcome, one just need to maintain it in close proximity to the individuals baseline. Here the approach needs to be personalized considering the routine BP and presence of complications, associated components of the metabolic syndrome and the type of surgery.¹³ In the absence of these risk factors, a single preoperative reading below 180/110 mmHg shall not become the reason for panic and postponement of planned surgery.

CONCLUSION

Perioperative HTN increases the chances of postoperative increase in CV events like ischemia or dysrhythmias, cerebrovascular events, bleeding, and overall mortality. BP over 180/110 mmHg is arbitrarily taken as a cut off limit to postpone elective surgery in the absence of universally accepted guidelines. Blood pressure variability (BPV) is a newly developing concept to stress upon the dynamic fluctuations in cardiovascular (CV) regulation under varying environmental, physical, and emotional factors as part of BP homeostasis. AHA guidelines clearly mentions that in Stage 1 and Stage 2 HTN it is perfectly safe to proceed with surgery as the risk of peri-operative adverse outcomes is same. However in Stage 3 HTN or

in patients above 80 years or in patients with diabetes and renal disease patients recommended targets of <130/85 mmHg and <125/75 mmHg shall be achieved by pharmacotherapy before proceeding for surgery.

Author's Contribution:

Concept & Design of Study: Mohammad Mohsin Rana
 Drafting: Sajid Rashid Nagra, Zafar Latif Awan
 Data Analysis: Danish Gani, Zafar Iqbal Zafar, Muhammad Saleem Akhtar
 Revisiting Critically: Mohammad Mohsin Rana, Sajid Rashid Nagra
 Final Approval of version: Mohammad Mohsin Rana

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Crowther M, van der Spuy K, Roodt F, Neithardt MB, Davids JG, Roos J, et al. The relationship between pre-operative hypertension and intra-operative haemodynamic changes known to be associated with postoperative morbidity. <https://doi.org/10.1111/anae.14239>
2. Lloyd-Jones D, Adams R, Carnethon M, De Simone G, Ferguson TB, Flegal K, et al. Heart disease and stroke statistics--2009 update: A report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee *Circulation* 2009;119:480-6.
3. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL Jr, et al The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: The JNC 7 report *JAMA* 2003;289:2560-72
4. Wilbert S. Aronow ; Management of hypertension in patients undergoing surgery 2017; 5(10): 227.
5. Mylona I, Dermenoudi M, Ziakas N, Tsinopoulos I. Hypertension is the Prominent Risk Factor in Cataract Patients: Medicina (Kaunas) 2019;55(8): 430.
6. Hypertension, the Clinical Management of Primary Hypertension in Adults. Update of Clinical Guidelines 18 and 34. NICE Clinical Guidelines, No. 127.
7. NICE Clinical Guidelines, No. 127. National Clinical Guideline Centre (UK).London: Royal College of Physicians (UK); 2019 Aug. Bookshelf ID: NBK83274PMID: 22855971
8. Gianfranco Parati, George S. Stergiou, Eamon Dolan, Grzegorz Bilo: Blood pressure variability:

- clinical relevance and application.
<https://doi.org/10.1111/jch.13304>
9. Mancia G, Parati G. Ambulatory blood pressure monitoring and organ damage. *Hypertension* 2000;36:394-399.
 10. Trudeau L. Central blood pressure as an index of antihypertensive control: determinants and potential value. *Can J Cardiol* 2014;(30):23-28
 11. Leblanc MÈ, Auclair A, Leclerc J, Bussièrès J, Agharazii M, Hould FS, et al. Blood pressure measurement in severely obese patients: Validation of the forearm approach in different arm positions. *Am J Hypertens* 2019;32:175–85.
 12. Lira, Cavalcanti RP, Nascimento, Abujamra M, Arieta, Leite CE, et al. Incidence of preoperative high blood pressure in cataract surgery among hypertensive and normotensive patients. *Ind J Ophthalmol*–2010;58(6): 493-495
 13. Meng L, Yu W, Wang T, Zhang L, Heerdt PM, Gelb AW. Blood Pressure Targets in Perioperative Care. Provisional Considerations Based on a Comprehensive Literature Review. *Hypertension* 2018;72(4):806-817.