SHORT REPORT

Frequency of Peri-operative Hypertension in a tertiary care hospital in Karachi, Pakistan

Momena Sohail,[1] Aysha Almas,[2] Ayesha Majeed,[3] Bushra Usmani,[4] Aamir Hameed Khan,[5] Gauher Afshan[6]

Abstract

This study aims to determine the frequency of perioperative hypertension and its types (pre, intra and post-operative) hypertension in patients admitted for surgical procedures. This was a cross-sectional study conducted between the years 2012-2013 at the Aga Khan University Hospital, Karachi. Patients admitted for any surgical procedure during this time were included. Perioperative hypertension has been defined as systolic blood pressure of >140 mm Hg or a diastolic blood pressure of >90 mm Hg or whose blood pressure increased by 20% during surgery. A total of 428 surgical procedures were reviewed for the study. Overall perioperative hypertension was present in 231 (54%) of the patients. In the sample, 91 (21.7%) had pre-operative hypertension, 126(29.4%) reported pre-surgery hypertension, 24(5.6%) had intra-operative hypertension and 63(14.7%) had post-operative hypertension. Mean pain score was 1.43(1.4) v 1.25(1.2) in those with post-operative hypertension v no post-operative hypertension (p value 0.009).

Keywords: Hypertension, Per opérative, Surgery.

Introduction

Perioperative hypertension occurs in 25% of hypertensive patients that undergo surgery.[1,2] Hypertension is commonly encountered in pre-operative assessments.[3] Perioperative hypertension is defined as a sustained elevated blood pressure (BP) typically ≥140/90mm Hg immediately before, during or after a surgical procedure.[2,4]

In a survey conducted amongst anaesthesiologists, Preoperative Hypertension was recognised as the most common avoidable medical indication for postponing anaesthesia and surgery. Though widely investigated in the 90s, we were unable to find more recent data on the prevalence of perioperative hypertension and no data of its prevalence in Pakistan. It is therefore important to determine the frequency of perioperative hypertension in patients admitted for surgical procedures and also to determine the prevalence of the types of preoperative hypertension. Additionally we wanted to see the proportion of patients with white coat hypertension in the study and to what degree pain plays a role in increasing blood pressure post-operatively.

[1,3,4,6]Aga Khan University Medical College, [2]Department of Internal Medicine, Aga Khan University Medical College, [5]Department of Medicine, Aga Khan University Medical College, Karachi, Pakistan.
Correspondence: Aysha Almas. Email: aysha.almas@aku.edu

Methods and Results

This was a cross-sectional study, conducted from December 2012 to December 2013 at the Aga Khan University Hospital Karachi, Pakistan, after taking approval from the Aga Khan University's ethical committee (ERC letter: 2403- Med-ERC-12). International classification of diseases ICD 9 CM was used to compile medical record data of patients admitted at the hospital for any surgical procedure. A minimum sample size of 237 patients was required for a proportion of patients to have 19% perioperative hypertension presented in the OR, with bound on error of 5% and alpha of 5%.[5] All adult patients aged 18 years and above, admitted for any surgical procedure were included. Patients were further divided into two age groups of 18-40 years and >40 years of age.

Perioperative hypertension has been defined as a consistent BP measured at systolic blood pressure >140 mm Hg or a diastolic blood pressure at>90 mm Hg, recorded before, during or immediately after surgical procedures.[6] It was further divided into pre, intra and post-operative hypertension. Pre-operative hypertension is defined as patients with elevated BP >140/90 mm Hg recorded before surgery, measured during pre-operative anaesthesia assessment or in the ward the night before

Table-1: Prevalence of perioperative hypertension and its type in patients undergoing surgery.

Hypertension	N=486
Perioperative	231 (54%)
Pre-operative*	91 (21.7%)
Pre-surgery**	126 (29.4%)
Hypertension during surgery	24 (5.6%)
Post-operative hypertension	63 (14.7%)

*hypertension in outpatient clinic at the time of initial assessment
**hypertension just before surgery.

Table-2: Comparison of pain scores according to presence or absence of post-operative hypertension.

Pain score	Post-operative hypertension n=142 Mean(8)	No Post-operative hypertension n=286	P value
Pains score in recovery	1.43(1.4)	1.25(1.2)	0.009
Pain score at 12 hrs post-op	2.56(10.9)	0.84(1.0)	0.02
Pain score at 24 hrs post-op	1.79(7.7)	0.67(0.9)	0.3

surgery. Pre-surgery hypertension is defined as elevated BP >140/90 mm Hg recorded in the surgical preparation room immediately before surgery. Intra-operative hypertension is defined as a rise in patients' blood pressure during surgery while under anaesthesia. A pre-operative measurement of >20% rise in blood pressure or when the blood pressure is recorded at>140/90,is considered as intra-operative hypertension.[4] Post-operative hypertension has been defined as a significant increase in BP immediately after surgery with a blood pressure of>140/90 mm Hg. Pain was measured using the numerical rating scale of pain (Numeric Rating Scale-11) where the patient scores his/her pain rating from 0 (no pain) to 10 (worst imaginable pain).[7] Pain scores were recorded immediately after surgery, in recovery room and within 24 hours.

Frequency and percentage was used to report categorical variables and mean and standard deviation for quantitative variables. Student t-test was used to compare those with and without perioperative hypertension. Statistical package for social sciences was used for analysis (version 19.1).

The data of all the 428 patients was included in the final analysis. This included data from 334 (87%) elective and 87 emergency surgeries. The mean age[8] of patients was 41.3 (16.2%) and 163(38.1%) were males. Out of these 97 (22.7%) were known hypertensive, 20 (4.7%) were known diabetic and 20(4.7%) had known ischaemic heart disease. In the types of general anaesthesia: 344 (80.4%) were given general anaesthesia, 35(8.2%) were given regional and 49(11.4%) were given local anaesthesia. Pain control was well managed with only 4.3% reporting a pain score of >3 in recovery.

Overall perioperative hypertension was recorded in 231 (54%) of the cases. Further classification of perioperative hypertension is detailed in Table-1. The stratification of patients in ages 18-40 years and >40 years, revealed out of these 95 (41.3%) and 136(58.7 %) respectively had perioperative hypertension.

Table-2 compares post-operative pain scores in recovery after 12 and 24 hours in patients with and without post-operative hypertension. Pain score was relatively high in patients with post-operative hypertension in recovery room; Mean pain score 1.43(1.4) v 1.25(1.2) in those with post-operative hypertension v no post-operative hypertension (p = 0.009).

Discussion

Our study reports the frequency of perioperative hypertension at 54%, which is significantly higher than previously reported prevalence ranging from 4-35%.[9] The prevalence of intra-operative hypertension in our study is 5.4% which is lower than the previously reported figure of <10%.[10] This showed a marked difference in the prevalence of hypertension between pre-surgery, intra-operative and post-operative periods. Both pre-surgery and post-operative hypertension were markedly higher at 26% and 14% respectively. Previous reports show that patients with intra-operative hypertension might have had excessive pain and inadequate ventilation which puts them at a higher risk of developing complications. This suggests that relatively low level of intra-operative hypertension recorded in this study was due to less hypertension during surgery.

It is important to note that in general >50% of patients, whose hypertension was not known, showed pre-operative hypertension during clinic anaesthesia assessment. One possible explanation is that hypertension is being under-reported in Pakistan, with majority of people only getting a full work up done only during clinic visits prior to surgery. This might be one reason for the high frequency of undiagnosed hypertension reported in this study.

Advanced anaesthetic agents, better post-operative pain control medications and devices have revolutionized pain management in the past two decades.[11] Although the pain score in our study was <3% overall, the pain score was higher in patients with post-operative hypertension after 12 hours in recovery, compared to those without post-operative hypertension. This highlights the fact that pain control is still important despite recent advances in pain control armamentarium.

The strength of this study is that it reports on the types of perioperative hypertension using very stringent methods of blood pressure measurement. Our study does have certain limitations. As it is a single-centered study, with a relatively small sample size, the results cannot be generalised to other hospitals. Since the data was collected from charts, there is a possibility of reporting bias. We could not include data on antihypertensive medications on a large number of participants as most

were not known hypertensives.

Conclusion

Our study reports a frequency of 54% perioperative hypertension among patients, but a relatively low intraoperative hypertension.

Disclaimer: The abstract was presented in the Department of Medicine, Annual Research Day, Aga Khan University.

Conflict of Interest: None to declare.

Funding Disclosure: None to declare.

References

1. Wijeysundera DN, Duncan D, Nkonde-Price C, Virani SS, Washam JB, Fleischmann KE, et al. Perioperative beta blockade in noncardiac surgery: a systematic review for the 2014 ACC/AHA guideline on perioperative cardiovascular evaluation and management of patients undergoing noncardiac surgery: a report of the American College of Cardiology/American Heart Association Task Force on practice guidelines. J Am Coll Cardiol. 2014; 64:2406-25.
2. Fleisher LA, Fleischmann KE, Auerbach AD, Barnason SA, Beckman JA, Bozkurt B, et al. 2014 ACC/AHA guideline on perioperative cardiovascular evaluation and management of patients undergoing noncardiac surgery: a report of the American College of Cardiology/American Heart Association Task Force on practice guidelines. Circulation. 2014; 130:2215-45.
3. Sanders R. How important is peri?operative hypertension? Anaesthesia. 2014; 69:948-53.
4. Varon J, Marik PE. Perioperative hypertension management. Vasc Health Risk Manag. 2008; 4: 615-27.
5. Monteiro Junior F, Anunciacao FA, Salgado Filho N, Silva GM, Barbosa JB, Ferreira PA, et al. Prevalence of true hypertensive crises and appropriateness of the medical management in patients with high blood pressure seen in a general emergency room. Arq Bras Cardiol. 2008; 90:247-51.
6. Umezawa H, Terada J, Tanabe N, Sugiura T, Naito A, Nishikimi K, et al. Perioperative management with upfront combination therapy in a patient exhibiting idiopathic pulmonary hypertension with central pulmonary thrombosis. Intern Med. 2014; 53:777-81.
7. Williamson A, Hoggart B. Pain: a review of three commonly used pain rating scales. J Clin Nurs. 2005;14:798-804.
8. Task Force M, Montalescot G, Sechtem U, Achenbach S, Andreotti F, Arden C, et al. 2013 ESC guidelines on the management of stable coronary artery disease: the Task Force on the management of stable coronary artery disease of the European Society of Cardiology. Eur Heart J. 2013; 34:2949-3003.
9. Halpern NA, Alicea M, Krakoff LR, Greenstein R. Postoperative hypertension: a prospective, placebo-controlled, randomized, double-blind trial, with intravenous nicardipine hydrochloride. Angiology. 1990; 41:992-1004.
10. Rosenthal J, Bahrmann H, Benkert K, Baumgart P, Bonner G, Klein G, et al. Analysis of adverse effects among patients with essential hypertension receiving an ACE inhibitor or a beta-blocker. Cardiology. 1996; 87:409-14.
11. Chou R, Gordon DB, de Leon-Casasola OA, Rosenberg JM, Bickler S, Brennan T, et al. Management of Postoperative Pain: A Clinical Practice Guideline From the American Pain Society, the American Society of Regional Anesthesia and Pain Medicine, and the American Society of Anesthesiologists' Committee on Regional Anesthesia, Executive Committee, and Administrative Council. J Pain. 2016;17:131-57.